MACON WATER AUTHORITY

CONTRACT FOR

OHARA DRIVE NORTH 4-INCH FORCE MAIN REPLACEMENT

DECEMBER 12, 2025

CEG FILE NO: M0175.078

PROPRIETARY NOTICE

INDEX

TECHNICAL SPECIFICATIONS

END OF INDEX

SECTION 00020

INVITATION TO BID

THE MACON WATER AUTHORITY
MACON, GEORGIA

Sealed Bids for furnishing all materials, labor, tools, equipment and appurtenances necessary for the installation of Ohara Drive North 4-Inch Force Main Replacement (the "Project") will be received by the Macon Water Authority (the "Owner"), at the Macon Water Authority, 537 Hemlock Street, Engineering Training Room, Macon, Georgia 31201 until 2:00 P. M., local time, Tuesday, March 3, 2026, and then at said office publicly opened and read aloud. All bidders must attend a mandatory pre-bid meeting at the Macon Water Authority, 537 Hemlock Street, Engineering Training Room, Macon, Georgia 31201 at 10:00 A.M. on Tuesday, February 17, 2026. All bid questions must be submitted to the Owner by 10:00 A.M. on Monday, February 23, 2026. The Bidder should attend the pre-bid meeting in its entirety.

The Project consists of installing approximately 690 LF of 4-inch DR 9 DIPS HDPE Sanitary Sewer Force Main by Open Trench and Jack and Bore methods. Pipe material to be furnished by the Macon Water Authority.

The Project will be awarded in one Contract. Fifty-one percent (51%) of the Work under the Contract Documents must be self-performed by the General Contractor. The Project will be awarded by base bid on a lump sum basis for the performance and completion of all Work required by the Contract Documents.

The Contract Documents include, but may not be limited to, the Instructions to Bidders, the Contract Agreement, the General Conditions, the Drawings, the Specifications (Divisions 01 through 46, inclusive, where applicable), and the forms of Bid Bond, Performance Bond, and Payment Bond. These and any other Contract Documents may be examined at the following location:

Engineering Department
Macon Water Authority
537 Hemlock Street
Macon, GA 31201

Copies of Contract Documents may be obtained at the office of the Engineer, (Carter Engineering Group, LLC, 6310 Peake Road, Suite 200, Macon, GA 31210, 478-219-2600) upon a non-refundable payment of **$150.00** for each set. A street address must be provided to ensure prompt delivery. No partial sets of bidding documents shall be issued. **Bidders must purchase the Contract Documents in order to be eligible to submit a bid.** Bid documents on the MWA website are for informational purposes only.

Each Bid must be accompanied by a Bid Bond in the amount of 10% of the Bid, prepared on the form of Bid Bond that is part of the Contract Documents, duly executed by the Bidder as principal and having as surety thereon a surety company licensed to do business in the State of Georgia and listed in the latest issue of U.S. Treasury Circular 570.

Bidders must comply with the Disadvantaged Business Enterprise Participation Requirements specified in the Instructions to Bidders.

The Bidder shall affix to the outside of its Bid envelope the Bidder's Georgia Utility Contractor License Number. A license number of a Utility Manager or a subcontractor is insufficient, and any Bid that fails to affix to the outside of its Bid envelope the Bidder's Georgia Utility Contractor License Number may be rejected.

The successful Bidder for this Project shall be required to furnish a Performance Bond and Payment Bond, satisfactory to the Owner, each in the amount of 100 % of the Contract Price.

Employment of Local Businesses and Contractors: It is the desire of the Owner that local businesses--including disadvantaged, minority, and women enterprise subcontractors-- be given the opportunity to participate on the various parts of the Work.

The Owner's encouragement of participation of disadvantaged, minority, and women enterprises and of locally owned businesses and contractors is not intended to restrict or limit competitive bidding or to increase the cost of the Work. The Owner supports a healthy, free market system that seeks to include responsible local businesses and provide ample opportunities for local business growth and development.

In an effort to assist minority-owned businesses, Georgia law permits an income tax adjustment on the state tax return of any company that subcontracts with a certified minority-owned firm to furnish goods, property or services to the State of Georgia pursuant to O.C.G.A. §48-7-38. Suppliers should consult with their tax advisors to find out how to take advantage of these tax credits.

The Owner reserves the right to reject any or all Bids. The Owner reserves the right to waive informalities and technicalities.

The Macon Water Authority
Ron Shipman
Executive Director & President

END OF SECTION

SECTION 00100

INSTRUCTIONS TO BIDDERS

1.01 CONTRACT DOCUMENTS

A. The Bidder's attention is directed to the General Conditions and other Contract Documents, all of which should be reviewed and studied by the Bidders before submitting a Bid.

B. The Contract Documents shall define and describe the complete Work to which they relate.

1.02 DEFINITIONS

The Bidder's attention is called to the definitions set forth in Article 41 of the General Conditions.

1.03 PREPARATION AND EXECUTION OF BID

A. Each Bid must be prepared to represent that it is based solely upon the materials and equipment specified in the Contract Documents.

1. *Trade Names.*— When reference is made in the Contract Documents to trade names, brand names, or to the names of manufacturers, such references are made solely to indicate that products of that description may be furnished and are not intended to restrict competitive bidding. Unless requests for approvals of other products have been received and approvals have been published by addendum in accordance with the procedure described below in this Section, the successful Bidder may furnish no products of any trade names, brand names, or manufacturers' names except those designated in the Contract Documents.
2. *Use of other products.*—If a Bidder desires to use products of trade or brand names or of manufacturers' names which are different from those specified in the Contract Documents, application for the approval of the use of such products must be received by the Engineer at least ten (10) days prior to the date set for the opening of Bids. The application to the Engineer for approval of a proposed product must be accompanied by:
    a. a schedule setting forth in which respects the materials or equipment submitted for consideration differ from the materials or equipment designated in the Contract Documents; and
    b. a copy of the published recommendations of the manufacturer for the installation of the product together with a complete schedule of changes in the drawings and specifications, if any, which must be made in other work in order to permit the use and installation of the proposed product in accordance with the recommendations of the manufacturer of the product.

In addition, the Engineer will give consideration to reports from reputable independent testing laboratories, verified experience records showing the reputation of the proposed product with previous users, evidence of reputation of the

manufacturer for prompt delivery, evidence of reputation of the manufacturer for efficiency in servicing its products, or any other written information that is helpful in the circumstances. To be approved, a proposed product must also meet or exceed all express requirements of the Contract Documents.

3. *Burden of proof.*— The degree of proof required for approval of a proposed product as acceptable for use in place of a named product or products is that amount of proof necessary to convince a reasonable person beyond all doubt.
4. *Request for conference.*—Any Bidder who alleges that rejection of a submittal is the result of bias, prejudice, caprice, or error on the part of the Engineer may request a conference with a representative of the Owner: PROVIDED, that the request for said conference, submitted in writing, shall be received by the Owner at least five (5) days prior to the date set for the opening of Bids, time being of the essence.
5. *Issuance of addenda.*— If the submittal is approved by the Engineer, an addendum will be issued to all prospective Bidders. Issuance of an addendum is a representation to all Bidders that the Engineer, in the exercise of its professional judgment and discretion, established that the product submitted for approval is acceptable and meets or exceeds all express requirements.

B. Each Bid must be submitted on the Bid forms which are a part of the Contract Documents. **All blank spaces for Bid prices, both words and figures, must be filled in and completed in ink.** In case of discrepancy, the amount shown in words will govern. All required enclosed certifications or other documents must be fully completed and executed when submitted.

C. In case of discrepancies between the figures shown in the unit prices and the totals, the unit prices shall apply and the totals shall be corrected to correspond with the unit prices. In case of discrepancies between written amounts and figures, written amounts shall take precedence over figures and the sum of all Bid extensions (of unit prices) plus lump sum items shall take precedence over the Bidders input of the Bid Total.

D. Each Bid must be submitted in a sealed envelope, addressed to the Macon Water Authority (the "Owner"). Each sealed envelope containing a Bid must be plainly marked on the outside as, "Ohara Drive North Force Main Replacement"**.**

E. The Bidder shall provide on the outside of the sealed envelope the following information:
   1. Bidder's Name;
   2. Bidder's Georgia Utility Contractor License Number (if applicable); and,
   3. The words, "SEALED BID"

F. Any Bid submitted which does not contain the above information on the outside of the sealed envelope will not be opened and will be returned to the Bidder.

G. If forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope addressed as follows:

THE MACON WATER AUTHORITY
Attn: Jay Payne
790 Second Street
Post Office Box 108
Macon, Georgia 31202-0108

H. Any and all Bids not meeting the aforementioned criteria for Bid submittal may be declared non-responsive, and subsequently returned to the Bidder unopened.

I. The Bidder, in signing a Bid on the whole or any portion of the Project, shall conform to the following requirements:

1. Bids which are not signed by individuals making the Bid shall have attached thereto a power of attorney evidencing authority to sign the Bid in the name of the person for whom it is signed.

2. Bids which are signed for a partnership shall be signed by all of the partners or by an attorney-in-fact. If a Bid is signed by an attorney-in-fact, there should be attached to the Bid a power of attorney executed by the partners evidencing authority to sign the Bid.

3. Bids which are signed for a corporation shall have the correct, legal corporate name thereof, as reflected in the records of the Georgia Secretary of State, and the signature of the president or other authorized officer of the corporation manually written below the corporate name following the wording "By _____." The corporate seal shall be affixed to the Bid.

4. The Bidder shall complete, execute and submit the following documents, (if applicable to the Bidder) which are a part of the Contract Documents:

a. The Bid;
b. The Bid Bond;
c. Statement of Bidder's Qualifications;
d. Statement of Equipment;
e. Corporate Certificate, if the Bidder is a corporation;
f. Statement of Disadvantaged Business Enterprise ("DBE") compliance;
g. Contractor's License Certification;
h. Photocopy of State of Georgia Utility Contractor's License;
i. Photocopy of Certificate of Authority from Georgia Secretary of State's Office to do work in Georgia (if out of state contractor);
j. Non-Collusion Affidavit of Prime Bidder;
k. Any and all forms, certifications or other documentation required by the Georgia Department of Natural Resources Environmental Protection Division.

1.04 METHOD OF BIDDING

The unit or lump sum price for each of the several items in the Bid of each Bidder shall include its pro rata share of overhead and profit so that the sum of the products, obtained by multiplying the quantity shown for each item by the unit price, represents the total Bid. Any Bid not conforming to this requirement may be rejected. Additionally, unbalanced Bids (including unbalanced unit prices) may be rejected. Conditional Bids shall not be accepted. ***The special attention of all Bidders is called to this provision, for should conditions make it necessary to revise the quantities, no limit will be fixed for such increased or decreased quantities, nor extra compensation allowed.***

1.05 ADDENDA AND INTERPRETATIONS

A. No interpretation of the meaning of the Drawings, Specifications or other pre-bid documents or Contract Documents shall be made to any Bidder orally.

B. Any and all such interpretations and any supplemental instructions will be in the form of written Addenda to the Contract Documents which, if issued, will be mailed, shipped or faxed to all prospective Bidders (at the respective addresses furnished) at least seventy-two (72) hours (exclusive of weekends and holidays) prior to the date fixed for the opening of Bids.

C. Failure of Bidders to receive or acknowledge any Addendum shall not relieve them of any obligation under the Bid or the Contract Documents. All Addenda shall become part of the Contract Documents and obligations there under binding.

1.06 BID MODIFICATIONS

Bidders may modify their Bid by facsimile communication at any time prior to the scheduled closing time for receipt of Bids, provided such facsimile communication is received by the Owner prior to the time Bids are required, and provided further that the Owner is satisfied that a written confirmation of the facsimile modification over the signature of the Bidder was mailed by the Bidder to the Owner prior to the time Bids are required. The facsimile communication should not reveal the Bid price but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed Bid is opened. If written confirmation from the Bidder is not received by the Owner within two business days from the time Bids are required, no consideration will be given to the facsimile modification and the facsimile modification shall be rejected.

1.07 BID SECURITY

A. Each Bid must be accompanied by a Bid Bond, prepared on the form of Bid Bond included herein, duly executed by the Bidder as principal and having as surety thereon a surety company authorized to do business in the State of Georgia and listed in the latest issue of U.S. Treasury Circular 570, in the amount of **ten (10%)** percent of the

Bid. Attorneys-in-fact who sign Bonds must file with each Bond a currently dated and valid original of their power of attorney. Where validity and currentness of a power of attorney are established by certification executed by a corporate officer, the certification shall be made and executed by a corporate officer of record, as reflected in the records of the Georgia Secretary of State, or by valid corporate resolution or authorization identifying such corporate officer.

B. Except as provided in O.C.G.A. §§ 36-91-52 and 36-91-53, if for any reason whatsoever the successful Bidder withdraws from the competition after opening of the Bids, or if Bidder refuses to execute and deliver the Contract and Bonds required in Article 2 of the General Conditions, the provisions of the Bid Bond may be enforced.

C. Except as provided in O.C.G.A. §§ 36-91-52 and 36-91-53, a Bid may not be revoked or withdrawn until sixty (60) days after the time set for opening the Bids. Upon expiration of this time period, the Bid will cease to be valid, unless the Bidder provides written notice to the Owner prior to the scheduled expiration date that the Bid will be extended for a time period specified by the Owner.

1.08 RECEIPT AND OPENING OF BIDS

The Owner may consider a technicality and informality any Bid not prepared and submitted in strict accordance with the provisions hereof and may waive any technicality and informality or reject any and all Bids. Any Bid may be withdrawn prior to the above scheduled time for the opening of Bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be opened.

1.09 CONDITIONS OF THE PROJECT

A. Each Bidder must be informed fully of the conditions relating to the construction of the Project and the employment of labor thereon. Failure to do so will not relieve a successful Bidder of the obligation to furnish all material and labor necessary to carry out the provisions of the Contract Documents. Insofar as possible, the Bidder, in carrying out the Work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

B. The Bidder is advised to examine the location of the Project and to be informed fully as to its conditions; access requirements, the conformation of the ground; the character, quality and quantity of the products needed preliminary to and during the prosecution of the work; the general and local conditions and all other matters which can in any way affect the work to be done under the Contract Documents. Failure to examine the site will not relieve the successful Bidder of an obligation to furnish all products and labor necessary to carry out the provisions of the Contract Documents.

C. The Bidder shall notify the Owner of the date and time Bidder proposes to examine the location of the Project. The Bidder shall confine examination to the specific areas designated for the proposed construction, including easements and public right-of-ways. If, due to some unforeseen reason, the proceedings for obtaining the proposed

construction site (including easements), have not been completed, the Bidder may enter the site only with the express consent of the property owner. The Bidder is solely responsible for any damages caused by examination of the site.

C. All anticipated federal, state and local permits required for the Project have been obtained.

D. All rights of way and easements anticipated for the Project have been obtained.

1.10 EQUAL EMPLOYMENT OPPORTUNITY

A. During the performance of the Contract, the Bidder agrees as follows:

1. The Bidder shall not discriminate against any employee or applicant for employment, or in any employment action during employment, based upon any applicable, legally-recognized and protected basis, including, but not limited to, veteran status, uniformed service member status, race, color, religion, sex, sexual orientation, gender identity, age (40 and over), pregnancy (including childbirth, lactation and related medical conditions), national origin or ancestry, citizenship status, physical or mental disability, genetic information (including testing and characteristics), or any other consideration protected by federal, state, or local law.

2. The Bidder shall, in all solicitation or advertisement for employees placed by or on behalf of Bidder, state that all qualified applicants will receive consideration for employment without regard to any applicable, legally-recognized and protected consideration, including, but not limited to veteran status, uniformed service member status, race, color, religion, sex, sexual orientation, gender identity, age (40 and over), pregnancy (including childbirth, lactation and related medical conditions), national origin or ancestry, citizenship status, physical or mental disability, genetic information (including testing and characteristics), or any other characteristic or basis protected by federal, state, or local law.

3. The Bidder shall send to each labor union or representative of the workers, with which the Bidder has a collective bargaining agreement or other contract or understanding, a notice advising the labor union or worker's representative of the Bidder's commitments under the Equal Employment Opportunity Program of the Owner and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

4. The Bidder and its subcontractors, if any, shall file compliance reports at reasonable times and intervals with the Owner in the form and to the extent prescribed by the Owner or the Georgia Department of Natural Resources. Compliance reports filed at such times as directed shall contain information as to the employment practices, policies, programs and statistics of the Bidder and its subcontractors.

5. The Bidder shall demonstrate by the documentation required in Paragraph C,

below, that a "Good Faith Effort" has been made to achieve compliance with the Owner's goal that a minimum of ten percent (10%) of the Contract Price shall be subcontracted to a Disadvantaged Business Enterprise (DBE), which includes *business enterprises owned by women and by minorities*. More specifically, as used herein, the term "DBE" means a firm or business which is at least fifty-one percent (51%) owned, operated, capitalized, and controlled by one or more United States citizens or lawfully admitted residents who are socially and economically disadvantaged, as defined below.

As used herein, social disadvantage means an individual who is a member of a *presumed group* or who is a *woman*. Economic disadvantage, as used herein, means, generally, a socially disadvantaged individual who does not have a personal net worth in excess of $1.32 million dollars, excluding the primary residence and ownership in the subject firm.

Member(s) of a *presumed group* include Black Americans (any Black racial group originating in Africa); Hispanic Americans (origins in Mexico, Puerto Rico, Cuba, Central and South America, or other Spanish or Portuguese cultures); Native Americans (Native of Alaska or Hawaii or certified member of a federal or state recognized Tribe); Asian Pacific Americans (origins in the Pacific Islands, China, Taiwan, Korea, Japan, Thailand, Burma, Cambodia, Vietnam, Malaysia, Indonesia, Singapore, or Philippines); and Subcontinent Asian Americans (origins in India, Pakistan, Bangladesh, Bhutan, Maldives Islands, Nepal, or Sri Lanka).

As used herein, the term "subcontracted" means providing subcontracting services or furnishing products or materials to be utilized in the performance of the Work.

6. The Bidder shall include the provisions of paragraphs 1 through 6 of this Section 1.10.A in every subcontract or purchase order so that such provisions will be binding upon each subcontractor or vendor.

B. In determining whether a Bidder has made "Good Faith Efforts", the Owner will look not only at the different kinds of effort that a Bidder has made, but also the quantity and intensity of these efforts.

C. The following list of kinds of efforts is provided for consideration, but this is not an exhaustive list of efforts that may be considered by the Owner:

1. Whether the Bidder attended any pre-solicitation or pre-bid meetings that were scheduled by the Agent to inform DBEs of contracting and subcontracting opportunities;

2. Whether the Bidder advertised in general circulation, trade association, and minority-focus media concerning the sub-contracting opportunities;

3. Whether the Bidder provided written notice to a reasonable number of specific DBEs that their interest in the Contract was being solicited, in sufficient time to

allow the DBEs to participate effectively;

4. Whether the Bidder followed up initial solicitations of interest by contacting DBEs to determine with certainty whether the DBEs were interested;

5. Whether the Bidder selected portions of the Work to be performed by DBEs in order to increase the likelihood of meeting the DBE goals (including, where appropriate, breaking down contracts into economically feasible units to facilitate DBE participation);

6. Whether the Bidder provided interested DBEs with adequate information about the Drawings, Specifications and requirements of the Contract Documents;

7. Whether the Bidder negotiated in good faith with interested DBEs, not rejecting DBEs as unqualified without sound reasons based on a thorough investigation of their capabilities;

8. Whether the Bidder made efforts to assist interested DBEs in obtaining bonding, lines of credit, or insurance required by the Contract Documents or Contractor; and

9. Whether the Bidder effectively used the services of available minority or women community organizations; minority or women contractor's groups; local, state and federal minority or women business assistance offices and other organizations that provide assistance in the recruitment and placement of DBEs.

D. Each Bidder shall include with his or her Bid a Statement of Disadvantaged Firm Utilization. Such statement shall include, as a minimum, the names and addresses of all disadvantaged/minority/women enterprise firms providing subcontracting services, furnishing products or materials, etc., the nature of the work to be contracted; and the anticipated cost of the services by each named firm as a percentage of the total Contract Price set forth in the Bid. The percentage participation should be calculated on the basis of the proportion of total dollar value of the Bid, including bulk purchase materials supplied by DBEs.

E. It is the desire of the Owner that DBEs be given the opportunity to bid on the various parts of the Work, and that to the extent feasible, DBE firms in the Middle Georgia area will be solicited and used in order to meet the DBE goal set forth above. However, this desire is not intended to restrict or limit competitive bidding or to increase the cost of the Work. The Owner supports a healthy, free market system that seeks to include responsible businesses and provide ample opportunities for business growth and development.

In an effort to assist minority-owned businesses, Georgia law permits an income tax adjustment on the state tax return of any company that subcontracts with a certified minority-owned firm to furnish goods, property or services to the State of Georgia pursuant to O.C.G.A. §48-7-38. Suppliers should consult with their tax advisors to find out how to take advantage of these tax credits.

1.11 NOTICE OF SPECIAL CONDITIONS

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

1.12 OBLIGATION OF BIDDER

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

B. Special attention is directed to Article 4, "Insurance" contained at pages 00700-3 through 00700-6 in the General Conditions. The Owner requires (1) "Worker's Compensation and Employer's Liability Insurance," (2) "Commercial General and Umbrella Liability Insurance," (3) "Business Auto and Umbrella Liability Insurance," and (4) "Materials and Floater" Insurance. For each of the required policies, the Owner requires a certificate of insurance at least quarterly, a copy of the endorsement of the insurance company showing the Owner as an additional insured, and a copy of the insurance policy declaration and any necessary endorsements.

C. Attention is further directed to Paragraph 6 of 00500, Contract Agreement and Article 9 of 00700, General Conditions regarding assignments. Prior written consent of the Owner is required for any assignment of any portion of this Contract, including any assignment due to "buyout" of Bidder or other acquisition of Bidder where the Bidder is a corporation or where Bidder is 50 percent or more owned by a corporation, firm, or person.

1.13 METHOD OF AWARD

A. The Contract, if awarded, will be awarded to the lowest responsible and responsive Bidder whose Bid meets the requirements and criteria set forth in the Contract Documents. The Contract, if awarded, will be awarded by base bid on a lump sum basis, comprised of unit prices, for the performance and completion of all Work required by the Contract Documents.

B. The Bidder to whom the award is made will be notified. The Owner reserves the right to reject any and all Bids and to waive any technicalities and informalities in Bids received whenever such rejection or waiver is in the Owner's interest.

C. A responsive Bidder shall be one who submits a Bid in the proper form without qualification or intent other than as called for in the Contract Documents, and who binds itself on behalf of the Bid to the Owner with the proper Bid Bond completed and attached, and who properly completes all forms required to be completed and submitted at the time of the Bidding. The Bidder shall furnish all data, documents, forms, and certifications required by the Contract Documents. Failure to do so may result in the Bid being declared non-responsive.

D. A responsible Bidder shall be one who can fulfill the following requirements:

1. The Bidder shall maintain a permanent place of business. This requirement applies to the Bidder where the Bidder is a division of a corporation, or where the Bidder is 50 percent or more owned by a person, corporation or firm.

2. The Bidder shall demonstrate adequate construction experience and sufficient equipment resources to properly perform the work under and in conformance with the Contract Documents. This evaluation will be based upon a list of completed or active projects and a list of construction equipment available to the Bidder to perform the work. The Owner may make such investigations as deemed necessary to determine the ability of the Bidder to perform the Work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may reasonably request. The Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Contract Documents and to complete the Project contemplated therein.

3. The Bidder shall demonstrate financial resources of sufficient strength to meet the obligations incident to the performance of the Work covered by the Contract Documents. The ability to obtain the required Performance and Payment Bonds will not alone demonstrate adequate financial capability.

1.14 EMPLOYMENT OF LOCAL LABOR

Preference in employment on the Project shall, insofar as practical, be given to qualified local labor.

END OF SECTION

FEDERAL WORK AUTHORIZATION PROGRAM AFFIDAVITS

EACH BIDDER MUST PROVIDE THE OWNER WITH THE PROPERLY COMPLETED AND PROPERLY SIGNED FEDERAL WORK AUTHORIZATION PROGRAM AFFIDAVITS AS REQUIRED BY O.C.G.A. § 13-10-91

THIS FORM MUST BE COMPLETED BY ALL CONTRACTORS, ALL SUBCONTRACTORS AND ALL SUB-SUBCONTRACTORS

THE FORMS ARE ATTACHED HERETO.

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 Macon Water Authority has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period 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 Number

_____
Date of Authorization

_____
Name of Contractor

_____
Name of Project

Name of Public Employer: the Macon Water Authority

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

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

_____
NOTARY PUBLIC

My Commission Expires: _____, 20___.

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 a contract with _____ _____ [insert name of contractor] on behalf of the Macon Water Authority has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned 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 Number

_____
Date of Authorization

_____
Name of Subcontractor

_____
Name of Project

Name of Public Employer: Macon Water Authority

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

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

_____
NOTARY PUBLIC

My Commission Expires: _____, 20____.

Sub-subcontractor Affidavit under O.C.G.A. § 13-10-91(b)(4)

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

_____
Federal Work Authorization User Identification Number

_____
Date of Authorization

_____
Name of Sub-subcontractor

_____
Name of Project

_____
Name of Public Employer

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

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

_____
Signature of Authorized Officer or Agent

_____
Printed Name and Title of Authorized Officer or Agent

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

_____
NOTARY PUBLIC

My Commission Expires: _____, 20___.

SECTION 00300

BID

TO: MACON WATER AUTHORITY

FROM:_____
(Bidder's Name)

FOR: Ohara Drive North 4-Inch Force Main Replacement

Submitted: _____, 20__

The undersigned Bidder, in compliance with your Invitation to Bid for the construction of this Project, having examined the Contract Documents and the site of the proposed Work, and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of materials and labor, hereby proposes to construct the Project in accordance with the Contract Documents.

The Bidder proposes and agrees, if this Bid is accepted, to contract with the Macon Water Authority, in the form of Contract Agreement specified, and to furnish all necessary products, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of the Work in full and complete accordance with the reasonably intended requirements of the Contract Documents to the full and entire satisfaction of the Macon Water Authority with a definite understanding that no money will be allowed for extra work except as set forth in the Contract Documents, for the following prices:

Item No.	Quantity	Unit	Description	Unit Price	Total Price
1	**INSTALL MWA FURNISHED 4" DIPS DR 9 HDPE FORCE MAIN**				
a.	1	LS	Mobilization and Bonds		
b.	690	LF	Install 4" HDPE Force Main by Horizontal Directional Drilling in Soil and Partially Weathered Rock.		
c.	50	LF	Install 4" HDPE Force Main by Horizontal Directional Drilling in Solid Rock when a rock head is used. Measured from the point rock is encountered to the Bore Terminus. (Not the entire length of the bore.) (Used only when approved by the MWA.)		
d.	1	LS	Furnish and Install Flow Meter Vault, Protecto 401 Ceramic Epoxy Lined Cl 350 Ductile Iron Pipe, Valves, and Fittings. Install MWA Furnished Flow Meter. Coordinate Electrical and SCADA Connections. Connect new force main to existing bypass piping.		
e.	1	LS	Core and connect new force main to existing discharge manhole. Includes fittings, cutting and plugging existing force main, furnishing and lining discharge manhole interior with ½" SewperCoat (or approved equal) lining.		
f.	2	CY	Flowable Fill		
2	**SITE WORK**				
a.	1	LS	Traffic Control		
b.	1	LS	Utility Pavement Patching including Class 'A' Asphalt Patching, asphalt saw cuts, removal & disposal. This item is all inclusive for any concrete pavement, asphalt pavement, graded aggregate and/or concrete curbing removal and replacement required to complete the force main installation.		
c.	150	LF	Furnish Install and Remove Sediment Barrier Silt Fence Type S (As Directed)		
c.	1	LS	Establish Permanent Grassing of Disturbed Areas with Block Sod to Match Existing		
3	**CONTINGENCY TO BE USED AT THE DIRECTION OF THE MWA**				
a.	1	LS	Contingency	$10,000.00	$10,000.00
	TOTAL BASE BID (ITEMS 1a-3a):				

Total Bid for Items 1 through __3a__, inclusive, in the amount of
_____Dollars
($_____) which sum hereinafter is called the "Base Bid".
The Bidder agrees hereby to commence Work under this Contract, with adequate personnel and equipment, on a date to be specified in a written order of the Engineer, and to fully complete all Work under this Contract within Ninety (90) consecutive calendar days from and including said date specified in the written order of the Engineer. Bidder further agrees to pay as liquidated damages, the sum of $200.00 for each calendar day thereafter required to achieve substantial completion of all Work.

The Bidder declares an understanding that the quantities shown for unit price items are subject to either increase or decrease, and that should the quantities of any of the items of Work be increased, the Bidder proposes to do the additional Work at the unit prices stated herein; and should the quantities be decreased, the Bidder also understands that payment will be made on the basis of actual quantities at the unit price bid and will make no claim for additional costs or anticipated profits for any decrease in quantities; and that actual quantities will be determined upon completion of Work, at which time adjustment will be made to the Contract Price by direct increase or decrease.

In case of discrepancies between the figures shown in the unit prices and the totals, the unit prices shall apply and the totals shall be corrected to agree with the unit prices. In case of discrepancies between written amounts and figures, written amounts shall take precedence over figures and the sum of all Bid extensions (of unit prices) plus lump sum items shall take precedence over the Bidder's represented BID TOTAL.

The Bidder furthermore agrees that, in the case of a failure to execute the Contract Agreement and Bonds within ten days after receipt of conformed Contract Documents for execution, the attached Bid Bond accompanying this Bid and the monies payable thereon shall be paid into the funds of the Macon Water Authority as liquidated damages for such failure.

Attached hereto is a Bid Bond for the sum of _____

_____ Dollars ($_____) according to the conditions of "Instructions to Bidders" and provisions thereof.

Bidder acknowledges receipt of the Following Addenda:

Addendum No. 1, dated:_____

Addendum No. 2, dated:_____

Addendum No. 3, dated:_____

Addendum No. 4, dated:_____

Remainder of Page Left Blank
[Signatures, attestations, and seal on following page]

BIDDER: _____

By: _____

Name: _____
(Print or Type)

Title: _____

Address: _____

_____

Phone: _____

Attest: _____

Name: _____
(Print or Type)

Title: _____

(SEAL)

Note: Attest for a corporation must be by the secretary of record for the corporation, as reflected in the records of the Georgia Secretary of State; for a partnership by another partner; for an individual by a notary.

Note: If the Bidder is a corporation, the Bid shall be signed by an officer of the corporation; if a partnership, it shall be signed by a partner. If signed by others, authority for signature shall be attached.

The full names and addresses of persons or parties interested in the foregoing Bid, as principals, are as follows:

Name	Address

END OF SECTION

SECTION 00410

BID BOND

STATE OF GEORGIA

COUNTY OF MACON-BIBB

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

WHEREAS, the Principal has submitted to the Owner a Bid for the _Ohara Drive North 4-Inch Force Main Replacement.

NOW THEREFORE, the conditions of this obligation are such that if the Bid be accepted, the Principal shall, within ten days after receipt of conformed Contract Documents, execute a Contract in accordance with the Bid upon the terms, conditions and prices set forth therein, and in the form and manner required by the Contract Documents and execute sufficient and satisfactory separate Performance and Payment Bonds payable to the Owner, each in an amount of 100 percent of the total Contract Price, in form satisfactory to the Owner , then this obligation shall be void; otherwise, it shall be and remain in full force and effect in law; and the Surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the aforesaid Owner, upon demand, the amount hereof in good and lawful money of the United States of America, not as a penalty, but as liquidated damages.

This bond is given pursuant to and in accordance with the provisions of the Georgia Procurement Manual and Georgia Local Government Public Works Construction Law, O.C.G.A. § 36-91-1 et. seq.. All the provisions of the law referring to this character of bond as set forth in said Manual or Code Sections or as may be hereinafter enacted and these are hereby made a part hereof to the same extent as if set out herein in full.

Remainder of Page Left Blank
[Signatures, attestations, and seals on following page]

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

CONTRACTOR - PRINCIPAL: _____

By: _____

Name: _____
(Print or Type)

Address: _____

_____

Phone: _____

Attest: _____

Name: _____
(Print or Type)

Title: _____

(SEAL)

Note: Attest for a corporation must be by the secretary of record for the corporation, as reflected in the records of the Georgia Secretary of State; for a partnership by another partner; for an individual by a notary.

SURETY: _____

By: _____

Name: _____
(Print or Type)

Title: _____

Phone: _____

Attest: _____

Name: _____
(Print or Type)

Title: _____

(SEAL)

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

END OF SECTION

SECTION 00420

STATEMENT OF BIDDER'S QUALIFICATIONS

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

1. Name of Bidder:_____

2. Permanent main office address:_____

3. When organized:_____

4. If a Corporation, where incorporated:_____

5. How many years have you been engaged in the contracting business under your present firm or trade name?_____

6. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion):_____

7. General description of type of work performed by your company:_____
_____

8. Have you ever failed to complete any work awarded to you? If so, where and why?
_____

9. Have you ever defaulted on a contract? If so, where and why?
_____

10. Attach a list of the most important projects recently completed by your company which are similar in scope to this Project. For each project, list its: official name and owner, a contact person's name, company and position, address and phone number; completion date; and contract amount.

11. Names, background and experience of the principal members of your organization, including officers:_____
_____

12. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated this _____ day of _____, 20___.

BIDDER:_____

By:_____

Title:_____

State of _____

County of _____

_____ being duly sworn deposes and says that he or she is _____ of _____and that the answers to the foregoing questions and all statements therein contained are true and correct. Subscribed and sworn to before me this _____ day of _____, 20___.

Notary Public:_____

(SEAL)

My Commission Expires:_____
(Date)

END OF SECTION

SECTION 00421

STATEMENT OF EQUIPMENT

Show machinery and other equipment available to the Bidder for prosecuting the Work required by the Contract Documents. (To be filled in by Bidder and submitted with Bid.)

Available Machinery and Other Equipment Kind - Size - Capacity	Location	Ownership	Date Proposed To Be Placed On Work

The above is a true statement of the equipment available to the undersigned Bidder for prosecuting the Work required by the Contract Documents. Where it is shown that the equipment is not owned by the Bidder, arrangements have been made with the owners to furnish the equipment.

Signed:_____

Name:_____

Title:_____

END OF SECTION

SECTION 00422

CORPORATE CERTIFICATE

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

This _____ day of _____, 20___.

(Corporate Secretary) _____

(SEAL)

END OF SECTION

SECTION 00423

STATEMENT OF DISADVANTAGED FIRM UTILIZATION

The Bidder shall list all disadvantaged firms, as are defined in the Instructions to Bidders, providing subcontracting services, furnishing products or materials, etc., to be utilized in the performance of the work. This list shall be submitted in the following format:

Subcontractor (Name & Address)	**Nature of Work to be Contracted**	**Group (Local, DBE)**	**Anticipated Cost of Services ($ Value, %)**
			$
			%
			$
			%
			$
			%
			$
			%
			$
			%
			$
			%
			$
			%
			$
			%
			$
			%

NOTE: Any proposed changes from the above list shall be submitted in writing to the Macon Water Authority prior to initiation of the action, with the reason for the proposed deviation.

END OF SECTION

SECTION 00425

CONTRACTOR'S LICENSE CERTIFICATION

Contractor's Name:_____

Georgia Contractor's License Number:_____

Expiration Date of License:_____

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

Signed:_____

Printed:_____

Date:_____

END OF SECTION

SECTION 00430

CONTRACTOR'S CERTIFICATION OF AUTHORITY

(IF OUT OF STATE CONTRACTOR)

Contractor's Name:_____

Georgia Certificate of Authority Number:_____

Expiration Date of Certificate:_____

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

Signed:_____

Printed:_____

Date:_____

END OF SECTION

SECTION 00480

NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

STATE OF GEORGIA COUNTY OF _____

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

He or she is _____

(Owner, Partner, Officer, Representative or Agent)

of _____, the Bidder that has submitted the attached Bid;

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

He or she understands that collusive bidding is a violation of State and Federal law and can result in fines, prison sentences, and civil damages awards;

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 Owner, the Macon Water Authority, 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. Affiant agrees to abide by all conditions of this Bid, and certifies that he or she is authorized to sign this Bid for the Bidder.

(Signed) _____

(Title) _____

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

_____ My Commission Expires:_____

(Notary Public)
(SEAL)

Note: If the Bidder is a partnership, all of the partners and any officer, agent or other person who

may have represented or acted for the partnership shall also make the foregoing oath. If the Bidder is a corporation, all officers, agents, or other persons who may have acted for or represented the corporation shall also make the oath.

END OF SECTION

SECTION 00500

CONTRACT AGREEMENT

AGREEMENT BETWEEN CONTRACTOR AND OWNER

THIS AGREEMENT is made and entered into on the __ day of _____ in the year Two Thousand and _____ (20___) by and between _____, hereinafter referred to as the "Contractor", and THE MACON WATER AUTHORITY, hereinafter (the "Owner") (collectively, "the Parties").

WITNESSETH, that the Contractor and the Owner, for the consideration hereinafter named, agree as follows:

1. SCOPE OF WORK. - That the Contractor will furnish all products, tools, construction equipment, materials, skill and labor of every description necessary to carry out, to perform, and to complete in a good, firm, substantial workmanlike manner the _Ohara Drive North 4-Inch Force Main Replacement project and will complete the Work in strict conformity with the Drawings and the Specifications (Divisions 01 through 46, inclusive, together with the foregoing Bid made by the Contractor, the Invitation to Bid, Instructions to Bidders, General and Supplementary Conditions, Special Conditions, Performance and Payment Bonds and all Addenda hereto incorporated (if applicable) which form essential parts of this Contract Agreement, as if fully contained herein, the same collectively referred to as the "Contract Documents."

2. TIME OF COMPLETION.-The Contractor shall commence the Work to be performed under this Contract Agreement on a date to be specified in a written Notice to Proceed and shall achieve substantial completion of all Work required by the Contract Documents within Ninety (90) consecutive calendar days (the "Contract Time"). Time is of the essence and is an essential element of this Contract, and the Contractor shall pay to the Owner, not as a penalty, but as liquidated damages, the sum of Two Hundred Dollars ($ 200.00) for each calendar day for which there is an unexcused delay in achieving substantial completion of the Work within the time limit set forth herein. These liquidated damages are not established as a penalty but are calculated and agreed upon in advance by the Owner and the Contractor due to the uncertainty and impossibility of making a determination as to the actual and consequential damages incurred by the Owner and the general public of Macon-Bibb County, Georgia as a result of the failure on the part of the Contractor to complete the Work on time. Such liquidated damages referred to herein are intended to be and are cumulative and shall be in addition to every other remedy now or hereafter enforceable at law, in equity, by statute, or under the Contract Documents.

3. THE CONTRACT PRICE.-The Owner shall pay to the Contractor for the faithful performance of the Contract Agreement, subject to additions and deductions as provided for in the Contract Documents, in current funds a sum of _____ Dollars ($_____.00) (the "Contract Price") which sum shall also pay for loss or damage arising out of the nature of the Work aforesaid, or from the action of the elements, or from unforeseen obstructions or difficulties encountered in the prosecution of the Work, and for all expenses incurred by, or in consequence of the Work, its suspension or discontinuance and for well and faithfully completing the Work and the whole thereof, as herein provided, and for replacing

defective Work or products for a period of one year after completion.

4. PROGRESS PAYMENTS The Owner shall make progress payments on account of the Contract Price as follows: On or about the 20th day of each month, ninety-five percent (95%) of the value, based on the contract prices, of labor and materials incorporated in the Work and of materials suitably stored at the site thereof up to the twenty-fifth day of the month preceding, as estimated by the Engineer, less the aggregate of previous payments. Application for Payment must be made on the standard Owner's form to be provided by the Owner to the Contractor. No form of collateral in lieu of cash will be acceptable as retainage. At the discretion of the Owner, the retainage of each Subcontractor may be released separately as each Subcontractor completes its work. An application for release of a Subcontractor's retainage shall bear the certificates of the Subcontractor, the Contractor, and the Engineer that the Subcontractor's work has been fully performed and that the sum for which payment is requested is due by the Contractor to the Subcontractor. Checks releasing a Subcontractor's retainage shall be made payable to the Contractor, the Contractor's surety, and the Subcontractor, and shall be mailed to the Contractor's surety. This Article does not create any contractual relationship between the Owner and the Subcontractor or any duty of the Owner to any Subcontractor. Payments pursuant to this Article shall in no way diminish, change, alter or affect the rights of the Owner under the Contract Documents.

5. FINAL PAYMENT.-(a)-Final payment including retainage, shall be due 30 days after the date of notice from the Owner of the final acceptance of the Work, provided that all other requirements of the Contract Documents shall have been met in full. Final payment shall be made by a check payable jointly to the Contractor and surety and shall be mailed to the surety.

(b)-Upon receipt of written notice from the Contractor pursuant to Article 30 of the General Conditions that the Work is ready for final inspection, the Engineer shall promptly make such inspection, and when he/she finds the Work complies with the Contract Documents, and when the Contract shall have been fully performed the Engineer shall promptly issue a final certificate of recommendation to the Owner, over the Engineer's signature, stating that the Work required by the Contract Documents has been completed under the terms and conditions thereof, and that the entire balance of the Contract Price found to be due to the Contractor and noted in said final certificate, is due and payable.

(c)-Before issuance of a final certificate of recommendation, the Contractor shall submit evidence satisfactory to the Engineer that all payrolls, material bills, and all other indebtedness in connection with the Work has been paid in full.

(d)-If full completion of the Work is materially delayed through no fault of the Contractor, and the Engineer so certifies same, the Owner shall, upon certificate of the Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed. Such payment shall be made under the terms and conditions of the General Conditions governing final payment, except that it shall not constitute a waiver of claims.

6. NO ASSIGNMENT.- This Contract and the proceeds of this Contract may not be assigned nor may the performance thereunder be assigned, except with the prior written consent of the Owner.

7. BONDS. – The Contractor shall furnish both a performance bond and a payment bond and shall pay the premium thereon. The performance bond shall guarantee the full performance of the Contract.

Remainder of Page Left Blank

[Signatures, attestations, and seals on following page]

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

Signed, sealed, and delivered
in the presence of:

THE MACON WATER AUTHORITY

1._____ By:_____
Gary Bechtel, Chairman

2._____

Attest:_____
Ron Shipman, Executive Director & President

(Official Seal)

Signed, sealed, and delivered
in the presence of:

CONTRACTOR:_____

1._____ By: (Signed) _____

2._____ (Printed) _____

Attest: (Signed) _____

(Printed) _____
(Secretary)

(Corporate Seal)

APPROVED AS TO FORM

_____

_____
(Printed Name)
Attorney for the Macon Water Authority

END OF SECTION

SECTION 00550

PRE-AWARD OATH

STATE OF GEORGIA
COUNTY OF _____

In accordance with O.C.G.A. 36-91-21(e), we, the undersigned of _____

being first duly sworn, depose and say that:

We have not directly or indirectly violated O.C.G.A. 36-91-21(d), and more specifically, we have not

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

We, the undersigned, to the best of our knowledge, affirm that no other officers, agents or other persons acted for or represented the Contractor in the bidding for and procurement of this Contract.

Signature	Printed Name	Title	Date

_____ My Commission Expires: _____
(Notary Public)

(SEAL)

END OF SECTION

SECTION 00600

PERFORMANCE BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS:

That

_____

(Legal title and address of the Contractor)

as Principal (hereinafter referred to as "Contractor"), and _____

_____

(Legal title and address of Surety)

as Surety (hereinafter referred to as "Surety"), do hereby acknowledge ourselves indebted and firmly bound and held unto the Macon Water Authority (the "Owner") in the amount of _____ Dollars ($_____) to which payment Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above bound Principal has entered into a Contract with Owner bearing date of _____ for construction of Ohara Drive North 4-Inch Force Main Replacement Project in accordance with Contract Documents prepared by Owner all of which said Contract Documents are incorporated herein by reference and made a part hereof, and are hereinafter collectively referred to as the "Contract."

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Contractor shall promptly and faithfully perform and comply with the terms and conditions of said Contract; and shall indemnify and save harmless the Owner against and from all costs, expenses, damages, injury or loss to which said Owner may be subjected by reason of any wrongdoing, including patent infringement, misconduct, want of care or skill, default or failure of performance on the part of said Principal, his agents, subcontractors of employees, in the execution or performance of said Contract, and shall fully reimburse and repay the said Owner any and all outlay, costs, and expense which it may incur in making good any such default and shall guarantee all products and workmanship against defects, as provided in the Contract Documents which comprise and constitute the Contract, for a period of one year and shall replace all defective work and products for such period of one year then this obligation shall be null and void; otherwise it shall remain in full force and effect.

1. The said Surety to this bond, for value received, hereby stipulates and agrees that no change or changes, extension of time or extensions of time, alteration or alterations or addition or additions to the terms of the Contract or to the Work to be performed thereunder, or the specifications or drawings accompanying same shall in any wise affect its obligations on this

bond, and it does hereby waive notice of any such change or changes, extension of time or extensions of time, alteration or alterations or addition or additions to the terms of the Contract or to the Work or to the specifications or drawings.

2. It is expressly agreed that this bond shall be amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the Contract Price more than 20 percent in excess of the original Contract Price, so as to bind the Principal and Surety to the full and faithful performance of the Contract as so amended. The term "amendment" shall include any alteration, addition, extension, or modification of any character whatsoever.

3. If pursuant to the Contract Documents the Contractor shall be declared in default by the Owner under the aforesaid Contract, the Owner shall take possession of the Project and finish the Work by whatever method the Owner may deem expedient, in accordance with Article 7 of the General Conditions.

4. Supplementary to and in addition to the foregoing, whenever the Owner shall notify the Surety that the Owner has notice that the Contractor has failed to pay any subcontractor, materialman, or laborer for labor or materials certified by the Contractor as having been paid for by the Contractor, the Surety shall, within thirty (30) days of receipt of such notice, cause to be paid any unpaid amount for such labor or materials.

5. It is expressly agreed by the Principal and the Surety that the Owner, if it desires to do so, is at liberty to make inquiries at any time of subcontractors, laborers, materialmen, or other parties concerning the status of payments for labor, materials, or services furnished in the prosecution of the work.

6. The Surety agrees that other than as is provided in this bond it may not demand of the Owner that the Owner shall (a) perform any thing or act, (b) give any notice, (c) furnish any clerical assistance, (d) render any service, (e) furnish any papers or documents, or (f) take any action of any nature or description which is not required of the Owner to be done under the Contract Documents.

7. No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the legal successors of the Owner.

This bond is given pursuant to and in accordance with the provisions of the Georgia Procurement Manual and of Title 36, Chapter 91 of the Official Code of Georgia Annotated, as may be amended or modified from time to time, and all the provisions of the law referring to this character of bond as set forth in said sections or as may be hereafter enacted or amended and these are hereby made a part hereof to the same extent as if set out in full herein.

Remainder of Page Left Blank
[Signatures, attestations, and seals on following Page]

Signed and sealed this _____ day of _____, 20___.

Signed, sealed and delivered
in the presence of:

_____
(Insert Name of Contractor)

By: (Signed)_____

1. _____

(Printed)_____

2. _____ Attest :(Signed) _____

(Printed)_____

(CORPORATE SEAL)

Signed, sealed and delivered
in the presence of:

_____
(Insert Name of Surety)

By: (Signed)_____

1. _____

(Printed)_____

2. _____ Attest :(Signed) _____

(Printed)_____

(CORPORATE SEAL)

APPROVED AS TO FORM:

_____

_____
(Printed Name)
Attorney for the Macon Water Authority

END OF SECTION

PLACE SURETY FOR PERFORMANCE BOND HERE

SECTION 00610

PAYMENT BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS:

That

_____

(Legal title and address of the Contractor)

as Principal (hereinafter referred to as "Contractor"), and _____

_____

(Legal title and address of Surety)

as Surety (hereinafter referred to as "Surety"), do hereby acknowledge ourselves indebted and firmly bound and held unto the Macon Water Authority (the "Owner"), in the amount of _____ Dollars ($_____.00) to which payment Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above bound Principal has entered into a Contract with Owner bearing date of _____ for construction of Ohara Drive North 4-Inch Force Main Replacement Project in accordance with the Contract Documents prepared by Owner, all of which said Contract Documents are incorporated herein by reference and made a part hereof, and are hereinafter collectively referred to as the "Contract."

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Contractor shall promptly make payment to all claimants as hereinafter defined for all labor and material supplied in the prosecution of the work provided for in said Contract Documents, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. The said Surety to this bond, for value received, hereby stipulates and agrees that no change or changes, extension of time or extensions of time, alteration or alterations or addition or additions to the terms of the Contract or to the Work to be performed thereunder, or the specifications or drawings accompanying same shall in any wise affect its obligations on this bond, and it does hereby waive notice of any such change or changes, extension of time or extensions of time, alteration or alterations or addition or additions to the terms of the Contract or to the work or to the specifications or drawings.

2. It is expressly agreed that this bond shall be amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract Documents not increasing the Contract Price more than 20 percent in excess of the original Contract Price, so as to bind the Contractor and Surety to the full and faithful performance of the Contract as so amended. The term "amendment" shall include any alteration, addition, extension, or modification of any character whatsoever.

3. A Claimant is defined as any subcontractor and any person supplying labor, materials, machinery, or equipment in the prosecution of the Work provided for in said Contract.

4. Every person or entity entitled to the protection hereunder and that has not been paid in full for labor or materials furnished in the prosecution of the Work referred to in said bond before the expiration of a period of ninety days after the day on which the last of the labor was done or performed by them, or materials or equipment or machinery was furnished or supplied by them for which such claim is made, or when they have completed its subcontract for which claim is made, shall have the right to sue on such payment bond for the amount, or the balance thereof, unpaid at the time of the commencement of such action and to prosecute such action to final execution and judgment for the sum or sums due them; provided, however, that any person or entity having direct contractual relationship with a subcontractor, but no contractual relationship, express or implied, with the Contractor, shall have the right of action upon this bond upon giving written notice to said Contractor within ninety days from the day on which such person or entity did or performed the last of the labor, or furnished the last of the materials or machinery or equipment for which such claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished or supplied or for whom the labor was performed or done; provided further that nothing contained herein shall limit the right of action to said 90-day period. Notice may be served by depositing a notice, registered mail, postage prepaid, duly addressed to the Contractor at any place the Contractor maintains an office or conducts business, including any post office or branch post office or any letter box under the control of the United States Postal Service, or notice may be served in any manner in which the sheriffs of Georgia are authorized by law to serve summons or process.

5. Every suit instituted under this section shall be brought in the name of the claimant without the Owner being made a party thereto. The official who has the custody of said bond is authorized and directed to furnish, to any person or entity making application therefor who submits an affidavit that it has supplied labor or material for such work and payment therefor has not been made, or that it is being sued on any such bond, a copy of such bond and the Contract for which it was given, certified by the official who has custody of said bond; this copy shall be primary evidence of this bond and Contract and shall be admitted as evidence without further proof. Applicants shall pay for such certified copies and such certified statements such as fees as the official fixes to cover the cost of preparation thereof, but in no case shall the fee exceed the fees which the clerks of the superior courts are permitted to charge for similar copies.

6. No action can be instituted on this bond after one year from the date of the final acceptance of the Owner.

This bond is given pursuant to and in accordance with the provisions of the Georgia Procurement Manual and of Title 36, Chapter 91 of the Official Code of Georgia Annotated, as may be amended or modified from time to time, and all the provisions of the law referring to this character of bond as set forth in said sections or as may be hereafter enacted or amended and these are hereby made a part hereof to the same extent as if set out in full herein.

[Signatures, attestations, and seals on following Page]

Signed and sealed this _____day of _____, 20___

Signed, sealed and delivered
in the presence of:

_____
(Insert Name of Contractor)

By: (Signed)_____

1. _____

(Printed)_____

2. _____ Attest :(Signed) _____

(Printed)_____

(CORPORATE SEAL)

Signed, sealed and delivered
in the presence of:

_____
(Insert Name of Surety)

By: (Signed)_____

1. _____

(Printed)_____

2. _____ Attest :(Signed) _____

(Printed)_____

(CORPORATE SEAL)

APPROVED AS TO FORM:

_____

_____
(Printed Name)
Attorney for the Macon Water Authority

END OF SECTION

PLACE SURETY FOR PAYMENT BOND HERE

SECTION 00700
GENERAL CONDITIONS

Article 1. - Notice of Award of Contract. Within sixty (60) days after receipt of Bids, the Owner will notify the successful Bidder of the award of the Contract. Should the Owner require additional time to award a Contract, the time may be extended by the mutual agreement between the Owner and the successful Bidder. If an award of Contract has not been made within 60 days from the Bid date or within the extension mutually agreed upon, the Bidder may withdraw the Bid without further liability on the part of either party.

Article 2. - Execution of Contract Documents. (a) *Time Limits.*—Within fifteen (15) days of notification of Award of Contract, the Owner will furnish the Contractor with conformed copies of Contract Documents for execution by the Contractor and the surety. The Contractor and its surety must execute the bond forms contained in the conformed Contract Documents without any changes. Within ten (10) days after receipt, the Contractor shall return all the Contract Documents properly executed by the Contractor and the surety. Attached to each set of Contract Documents shall be original powers-of-attorney for the person executing the Bonds for the surety and certificates, endorsements, and declarations of insurance for the required insurance coverages, all as required by Article 3 and Article 4. Within thirty (30) days after receipt of the conformed Contract Documents properly completed and executed by the Contractor and the surety together with the power-of-attorney, and the proper certificates, endorsements and declarations of insurance, the Owner will complete the execution of the Contract Documents. Distribution of the completed Documents will be made upon execution by the Owner.

(b) *Failure of Contractor or Surety to Execute Documents.*—Should the Contractor or the surety fail to properly execute the Documents within the specified time the Owner will have the right to proceed on the Bid Bond accompanying the Bid.

(c) *Failure of Owner to Execute Documents.*—If the Owner fails to execute the Documents within the time limit specified, the Contractor will have the right to withdraw the Bid without penalty. In such event the Owner will have no liability to the Contractor under these Documents or otherwise.

(d) *Extensions of Time.*—Should either party require an extension of any of the time limits stated above, this shall be done only by mutual agreement between both parties.

(e) Changes to Documents.-- Insertion, addition, alteration, modification, revision, or deletion of any text, verbiage, provision, statement, term, condition, or other component of the Contract Documents, whether textual, numerical, or pictorial, is prohibited and no such unilateral change to the Contract Documents shall be binding. In the event the Owner discovers any attempt by the Contractor to modify the Contract Documents by insertion, addition, alteration, revision, or deletion of any text, verbiage, provision, statement, term, condition, or other portion of the Contract

Documents without the written assent and approval of the Owner, the Owner shall have grounds to withdraw the contract award, terminate all proceedings related to contractual relationship with the Contractor for the subject Project, and to award the contract to the next bidder which met the requirements of the invitation to bid.

(f) *Incorporation of Prior Agreements*. — All agreements between the parties are incorporated into this Agreement. In the event of any conflict or inconsistency between this Agreement and any provisions, terms or conditions of any other prior agreement, the provisions, terms and conditions of this Agreement shall supersede, control and prevail over the conflicting or inconsistent provisions of the prior agreement.

Article 3. - Contract Security.—The Contractor shall furnish separate Performance and Payment Bonds each in a sum equal to the amount of the Contract Price on the Owner's forms. Such Bonds shall be executed by the Contractor and a bonding company licensed to transact such business in Georgia and named on the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these Bonds shall be borne by the Contractor.

If at any time a surety on any such Bond is declared bankrupt, becomes insolvent, loses its right to do business in Georgia or is removed from the list of Surety Companies accepted on Federal Bonds, the Contractor shall, within ten (10) days after notice from the Owner to do so, substitute acceptable Bonds in such form and sum and signed by such other surety as may be satisfactory to the Owner. The premium on such substitute Bonds shall be paid by the Contractor. No further progress payments shall be deemed due, nor shall any be made, until the new surety furnishes acceptable Bonds to the Owner. The person executing the substitute Bonds on behalf of the surety shall submit with the Bonds valid powers-of-attorney certified to by an official of said surety company.

Article 4. - Insurance—Proof of insurance coverage and furnishing of insurance policies acceptable to the Owner shall be as set forth in this Article.

(a) *Policies, Certificates, Limits and Disposition of Documents.*—The Contractor shall obtain at his expense insurance with limits as shown hereinbelow, unless the Contractor desires to broaden the limits and obtain more protection. The Contractor shall provide the Owner with all insurance documentation and evidence of insurance as required herein, and updated certificates of all insurance required herein must be provided to the Owner at least quarterly until Final Payment.

(1) WORKER'S COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE.— The Contractor shall procure and maintain Worker's Compensation and Employers Liability Insurance for all of his employees to be engaged in Work on the project under this contract, and in case any such Work is sublet, the Contractor shall require the Subcontractor similarly to provide Worker's Compensation and Employer's Liability Insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's insurance. Worker's Compensation insurance policies shall include GEORGIA under

Section 3A and shall include Other States coverage and Voluntary Compensation.

Worker's Compensation Limits:	Statutory
Employers Liability Limits:	
Each Accident	$1,000,000
Disease - Policy Limit	$1,000,000
Disease - Each Employee	$1,000,000

Contractor waives all rights against Owner and its agents, officers, directors, and employees for recovery of damages to the extent these damages are covered by the worker's compensation and employer's liability or commercial umbrella liability insurance obtained by Contractor pursuant to Article 4 of this agreement. The Waiver of Our right To Recover From Others Endorsement, ISO Form SC 00 03 13 shall be attached to the policy showing the Owner listed in the Schedule.

Disposition: Certificate(s) of insurance showing the required coverage and copy of declaration page must be returned to the Owner with properly executed Contract Documents. If requested by the Owner, Contractor shall also provide a certified copy of the policy(ies) required by Article 4(a)(1).

(2) COMMERCIAL GENERAL AND UMBRELLA LIABILITY INSURANCE.—The Contractor shall procure and shall maintain commercial general liability (CGL) and if necessary, commercial umbrella insurance with a limit of not less than $2,000,000 each occurrence, as shall protect him and any Subcontractor performing Work covered by this Contract from claims for damages for bodily injury, including accidental death, as well as from claims for property damages, which may arise from operations under the Contract Agreement, whether such operations are by himself or by any Subcontractor or by anyone directly or indirectly employed by either of them.

CGL insurance shall be written on ISO occurrence form CG 00 01 10 93 (or substitute form providing equivalent coverage) and shall cover liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury, and liability assumed under an insured contract (including the tort liability of another assumed in a business contract). If such CGL insurance contains a general aggregate limit, it shall apply separately to this project, (Per Project Aggregate Endorsement). Each policy shall be indorsed with ISO Form CG 25 03 11 85 or equivalent form with wording satisfactory to Owner.

The Owner shall be included as an additional insured under the CGL, using ISO additional insured endorsement CG 20 33 or a substitute providing equivalent coverage, and under the commercial umbrella, if any. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded to the Owner.

There shall be no endorsement or modification of the CGL limiting the scope of coverage for

liability arising from explosion, collapse, or underground property damage.

Contractor waives all rights against the Owner and its agents, officers, directors, and employees for recovery of damages to the extent these damages are covered by commercial general liability or commercial umbrella liability insurance maintained pursuant to Article 4 of this agreement.

Disposition: Certificate(s) of insurance showing the required coverage and copy of declaration page must be returned to the Owner with properly executed Contract Documents. If requested by the Owner, Contractor shall also provide a certified copy of the policy(ies) required by Article 4(a)(2).

(3) BUSINESS AUTO AND UMBRELLA LIABILITY INSURANCE.—The Contractor shall procure and shall maintain business automobile liability, and if necessary, commercial umbrella liability insurance with a limit of not less than $2,000,000 each occurrence.

Such insurance shall cover liability arising out of any auto (including owned, hired, and non-owned autos).

Business auto coverage shall be written on ISO form CA 00 01, CA 00 05, CA 00 12, CA 00 20 or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in the 1990 and later editions of ISO form CA 00 01. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded to the Owner. Owner is named as additional insured.

Contractor waives all rights against the Owner and its agents, officers, directors, and employees for recovery of damages to the extent these damages are covered by the business auto liability or commercial umbrella liability insurance obtained by Contractor pursuant to Article 4 of this agreement or under any applicable auto coverage.

Disposition: Certificate(s) of insurance showing the required coverage and copy of declaration page must be returned to the Owner with properly executed Contract Documents. If requested by the Owner, Contractor shall also provide a certified copy of the policy(ies) required by Article 4(a)(2).

Cross-Liability Coverage.—If Contractor's liability policies do not provide the standard ISO separation of insureds provision, or a substantially similar clause, they shall be endorsed to provide cross-liability coverage.

(3) By proper endorsement, the policy must name

MACON WATER AUTHORITY
790 Second Street
P. O. Box 108
Macon, GA 31202

as an additional insured and shall provide for not less than thirty (30) days prior written notice before cancellation or any material change in the policy, except for non-payment of premium which shall require ten (10) days prior written notice of cancellation, to the Owner.

(4) Commercial Umbrella/Excess Policy:

Contractor shall procure a commercial umbrella or excess policy with a limit of no less than $5,000,000. Coverage must follow form over underlying policies including GL, Auto and Employer's Liability insurance.

(5) MATERIALS AND EQUIPMENT FLOATER. - The Contractor shall procure, and shall maintain during the performance of the Contract Agreement, Materials and Equipment Floater (May be labeled as *Equipment Floater* or Installation Floater or Builders Risk) Insurance to protect the interests of the Owner, the Contractor and Subcontractors against loss by vandalism, malicious mischief, and all hazards included in a standard All Risk Endorsement. The amount of insurance shall at all times equal or exceed the amount of the materials in the Contract + *$30k for Owner furnished materials.* The policies shall be in the names of the Owner and the Contractor.

Disposition: Original policy must be returned to the Owner with properly executed Contract Documents. Owner may accept with returned, executed Contract Documents in lieu of an original policy, an insurance binder evidencing the policy coverage, but Contractor shall not be relieved of the obligation to furnish the actual policy.

Endorsement on Materials and Equipment Floater Policy.—There shall be attached to and made a part of the insurance policy for MATERIALS AND EQUIPMENT FLOATER an endorsement of the insurance company in accordance with the specimen shown in preceding Paragraph (a)(3).

Article 5. - Hazards and Indemnification. (a) *Hazards.* —The Contractor shall be responsible from the time of his execution of the Contract Documents or from the time of the beginning of the first work, whichever shall be earlier, for all injury or damage of any kind resulting from the Work to persons or property regardless of who may be the owner of the property. It is the intention of this paragraph to shift the full and complete risk of all such loss to the Contractor for the period of construction and until notice from the Owner of the final acceptance of the Work is made in accordance with Article 30, regardless of whether or not any particular hazard shall be insured against.

(b) *Indemnification.*—In addition to the liability imposed upon the Contractor on account of bodily injury (including death) or property damage, which liability is not impaired or otherwise

affected hereby, the Contractor assumes the obligation to save the Owner harmless and to indemnify and defend the Owner, the Engineer and their agents and employees from and against all claims, damages, losses and expenses including claims consultant's and attorney's fees arising out of or through bodily injury, sickness, disease or death of any person or persons or damage to property (regardless of who may be the owner of the property) including the loss of use resulting therefrom arising out of or suffered through any act or omission of the Contractor or any Subcontractor, or anyone either

(1) directly or indirectly employed by the Contractor, or
(2) under the supervision of the Contractor or any subcontractor in the prosecution of the Work required by the Contract Documents.

In any and all claims against the Owner or the Engineer, or any of their agents or employees, by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, this indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workers' compensation acts, disability benefit acts or other employee benefits acts.

(c) *Sole Negligence Exception.* —The Contractor shall not be liable or responsible for loss or damage, and the indemnity obligation set forth above will not apply if the incident from which the loss or damage arose was the result of the sole negligence or sole cause of the Owner, the Engineer, or their agents, servants and employees.

Article 6. - Notice to Proceed. The Notice to Proceed will be issued, following the pre-construction conference, within thirty (30) days of the execution of the Contract Agreement by the Owner. The time may be extended by mutual agreement between the Owner and the Contractor. If the Notice to Proceed has not been issued within the thirty (30) day period or within the period mutually agreed upon, the Contractor may terminate the Contract Agreement without further liability on the part of either party.

Within ten (10) days of receiving the Notice to Proceed, the Contractor must initiate on-site construction activity. If on-site construction activity is not initiated within this time period, the Owner may begin proceedings for Termination of Work for Default.

Article 7. - Termination of Work for Default. —(a) *Definition.*—The Work may be terminated for default if any one of the following events or circumstances occurs:

(1) The Contractor is adjudged bankrupt or becomes insolvent;

(2) The Contractor makes a general assignment for the benefit of creditors;

(3) A trustee or receiver is appointed for the Contractor or for any of Contractor's property;

(4) The Contractor files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws;

(5) The Contractor fails to supply sufficient skilled workmen, materials or equipment;

(6) The Contractor fails to make satisfactory progress toward timely completion of the Work;

(7) The Contractor fails to make prompt payments to Subcontractors or material suppliers for labor, materials or equipment;

(8) The Contractor disregards laws, ordinances, rules, regulations, or orders of any public body having jurisdiction of the Work;

(9) The Contractor fails to comply with directives of the Engineer; or,

(10) The Contractor otherwise violates any provision of the Contract Documents.

(b) *Grounds for Issuance of Notice of Declaration of Default.* —It shall be a sufficient ground for the issuance of a notice of declaration of default that the Contractor has been unfaithful or delinquent in the performance of the Contract or any part of it in any respect. The Engineer does not have authority to declare the Contractor in default.

(c) *Termination of Services and Possession of the Project.* —The Owner may, without prejudice to any other right or remedy and after giving the Contractor and surety written notice ten (10) days in advance, terminate the services of the Contractor and take possession of the Project, the Work and of all products thereon owned by the Contractor, and finish the Work by whatever method the Owner may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Project and all Work, including compensation for additional professional services, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor or surety shall pay the difference to the Owner. Such costs incurred by the Owner will be determined by the Engineer and incorporated in a Change Order.

(d) *Effect of Termination.* —Where the Contractor's services have been so terminated by the Owner, said termination will not affect any right of the Owner against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies by the Owner due the Contractor will not release the Contractor from compliance with the Contract Documents.

Article 8. - Termination for Convenience of Owner. (a) *General.* —If, for any reason other than those provided for under Article 7, the Owner elects to discontinue, in whole or in part, the Work

under this Contract, the Owner may, ten (10) days after delivery of a written notice to the Contractor and the Engineer, terminate, in whole or in part, the Contractor's performance of the Work under this Contract. The notice of termination shall specify the extent to which performance of the Work under the Contract is terminated.

(b) *Entitlement to Payment.* —In the event of such termination by the Owner, the Contractor shall be entitled to payment for the Work properly performed up to the time of the termination and reimbursement for such actual costs as are reasonably incurred by the Contractor due to the termination and not otherwise compensated. The Contractor shall also be entitled to profit on the amounts payable to the Contractor, but such profit shall be limited to six (6%) percent of such amounts. The Contractor shall not be entitled to any payment, including any anticipated profit, on Work not performed, and the Contractor shall not be entitled to any compensation or recovery of damages for any other costs, losses, or damages of any nature.

Article 9. - Assignments. The Contractor shall not assign the whole or any part of this Contract or any monies due or to become due hereunder without prior written consent of the Owner.

Should the Owner consent, in writing, to Contractor's assigning of all or any part of any monies due, or to become due, under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of any assignee in and to any monies due or to become due to the Contractor shall be subject to any set-offs then due to the Owner and to prior liens of all persons, firms, and corporations for services rendered or materials supplied for the performance of the Work called for under this Contract.

Article 10. - Subcontractors, Materialmen, Suppliers and Employees. —(a) *Submission of List*. -As soon as possible after notice of award of the Contract and in any event not later than the time fixed in the Contract for delivery of the executed Contract Documents to the Owner, the Contractor shall submit in writing to the Engineer a list of the names of Subcontractors that the Contractor will engage for the Work. The list of Subcontractors is not submitted for approval, but is for the purpose of establishing:

(1) What trades and portions of the Work are to be performed under subcontract; and,

(2) The names of the entities selected by the Contractor to perform work by subcontract, the aforesaid selection being a matter lying solely within the discretion of the Contractor.

The Contractor shall utilize the services of specialty Subcontractors on those parts of the Work which, under normal construction practices, are best performed by specialty Subcontractors and as may be required by the Engineer in the Engineer's sole discretion, at no additional cost to the Owner. If the Contractor desires to self-perform specialty Work, the Contractor shall submit a notice to the Owner accompanied by evidence that the Contractor's own organization has successfully performed the type of work, and the performance of the Work by specialty

Subcontractors will result in materially increased costs or inordinate delays.

(b) *No Approval of Subcontractors*.—Neither the Owner nor the Engineer undertakes to pass upon or approve any Subcontractor.

(c) *Warranty of Contractor*.—The Contractor warrants that the Subcontractors selected by the Contractor are reputable, skilled, reliable, competent, qualified in the trade or field in which such Subcontractors are to perform Work on the Project, and that all Subcontractors are thoroughly familiar with applicable codes.

(d) *Certification on account of*.—The Engineer shall, upon written request, furnish to any Subcontractor, wherever practicable, evidence of the amounts certified as payable or paid on the Subcontractor's account. Furnishing any such evidence shall not establish any relationship between the Engineer and any Subcontractor.

(e) *Contractor Responsible for Acts and Omissions of Subcontractors, Materialmen, Suppliers and Employees*.—The Contractor agrees that it is as fully responsible for the acts and omissions of its Subcontractors, materialmen, suppliers, and employees (and of entities either directly or indirectly employed by any of them) as the Contractor is for the acts and omissions of entities directly employed or engaged by the Contractor. The failure of a Subcontractor, materialman, supplier, or employee to timely and properly perform any Work shall not be asserted by the Contractor as an excuse for any omission from, or noncompliance with, the requirements of the Contract Documents; nor shall the Contractor be entitled to an extension of the Contract Time because of any failure of a Subcontractor, materialman, supplier, or employee to timely perform the Work unless such failure was a direct result of some critical delay to the Subcontractor, materialman, supplier or employee of the kind and character described under Article 28 of the General Conditions for which the Contractor shall have requested and received an extension of time under the terms of Article 28 of the General Conditions. The subcontracting of work does not relieve the Contractor of the full responsibility for the execution of the Work and for compliance with all requirements of the Contract Documents. The Contractor may not assert negligence, inefficiency, insolvency, bankruptcy, or incompetence of any Subcontractor, materialman, supplier, or employee as excuse for any noncompliance with methods and material designated in the Contract Documents. As to Subcontractors, materialmen, suppliers and employees of the Contractor, the doctrine that a principal is liable for acts and omissions of his agent shall be binding on the Contractor, and the Contractor may not reverse the aforesaid doctrine by serving as a conduit or agent for its Subcontractors, materialmen, suppliers and employees. Any provision in any Contract between the Contractor and any Subcontractor pursuant to which the Contractor is obliged to present to the Owner any claim of any Subcontractor shall be invalid, null and void.

(f) *No Contract Between Owner and Any Subcontractor, Materialman, Supplier, or Employee*.—Nothing contained in the Contract Documents shall create any contractual relationship between the Owner and any Subcontractor or between the Owner and any materialman, supplier or employee of the Contractor or its Subcontractors.

(g) *Relationship of Contractor and Subcontractors.*—The Contractor agrees to bind every Subcontractor to, and every Subcontractor agrees to be bound by, the terms of the Contract Documents, including the following provisions of this Article:

The Subcontractor agrees

(1) To be bound to the Contractor by the terms of the Contract Documents and to assume toward the Contractor all the obligations and responsibilities that the Contractor by the Contract Documents assumes toward the Owner.

(2) To submit to the Contractor applications for payment in such reasonable time as to enable the Contractor to apply for payment under Article 30 of the General Conditions.

(3) To make claims for extras, for extensions of time or for damages to the Contractor in the manner provided in the General Conditions for like claims by the Contractor upon the Owner.

The Contractor agrees

(1) To be bound to the Subcontractor by all the obligations that the Owner assumes to the Contractor under the Contract Documents.

(2) To pay the Subcontractor upon the payment of certificates issued under the schedule of values described in Article 24 of the General Conditions the amount allowed to the Contractor on account of the Subcontractor's work to the extent of the Subcontractor's interest therein; amounts retained by the Contractor from payments due to Subcontractors (expressed as a percentage) shall not exceed that being retained by the Owner.

(3) To pay the Subcontractor as required by the Contract Documents.

(4) To pay the Subcontractor on demand for its work or materials as far as executed and fixed in place, less the retained percentage, even though the Engineer fails to approve payment to the Contractor for any cause not the fault of the Subcontractor.

(5) To pay the Subcontractor a just share of any fire insurance money received by the Contractor.

(6) To make no demand for liquidated damages or penalty for delay in any sum in excess of such amount as may be specifically identified in the subcontract.

(7) That no claim for services rendered or materials furnished by the Contractor to the

Subcontractor shall be valid unless written notice thereof is given by the Contractor to the Subcontractor during the first ten days of the calendar month following that in which the claim originated.

(8) To give the Subcontractor an opportunity to be present and to submit evidence in any dispute involving rights of the Subcontractor.

(b) *Owner Not Obligated to any Subcontractor.*—There is no obligation on the part of the Owner to pay, or to see to the payment of, any sums to any (1) Subcontractor, (2) materialman, (3) supplier, (4) laborer, (5) employee, or (6) claimant as defined in the Payment Bond.

(c) *Incorporation of Terms in Subcontracts*.—The Contractor agrees that failure on its part to incorporate in all subcontracts an express provision in accordance with this Article shall be deemed to be and is a breach of an essential covenant, and that, in the event of such breach, that Contractor shall, within five (5) days after demand of the Owner, furnish proof in writing that the deficiency has been remedied and that (1) the Contractor may not maintain that it is beyond the Contractor's right or ability to require performance of terms of the Contract Documents by a Subcontractor and (2) no Subcontractor may maintain that it has not assumed toward the Contractor all the obligations and responsibilities that the Contractor has assumed toward the Owner.

Article 11 - Engineer.—(a) *Supervision.*—The Engineer shall have general supervision and direction of the Work except in respect to safety and except as qualified by Articles 27 and 36 of the General Conditions. He/she shall make visits to the Project site and make determination as to whether the Work is proceeding in accordance with the Contract Documents. Except for projects on which the Macon Water Authority itself serves in the capacity of engineer by use of its employees, which shall be indicated in the Contract Documents, the Engineer is an independent contractor and acts as the agent of the Owner only when in special instances he/she is authorized in writing by the Owner so to act, and in such instances he/she shall, upon request, show the Contractor written authority. The Engineer has authority to stop the Work whenever such stoppage may be necessary to ensure the proper execution of the Contract.

(b) *Interpreter and Impartial Judge.*—As the Engineer is the interpreter of the conditions of the Contract and the judge of its performance, the Engineer shall side neither with the Owner nor with the Contractor but shall use the Engineer's powers to enforce the faithful performance of the Contract by both the Owner and the Contractor.

(c) *Succession.*—In case of the termination of the employment of the Engineer, the Owner shall appoint a capable and reputable Engineer against whom the Contractor shall make no objection and whose status under the Contract shall be that of the former Engineer.

(d) *Promptness.*—The Engineer shall make decisions with reasonable promptness after presentation of evidence on (i) any claim of the Owner or Contractor, (ii) a demand of the Owner or Contractor for a decision on any matter relating to the execution, or progress, of the Work, or (iii) a

demand of the Contractor or Owner for interpretation of or additional instructions ("Request for Information" or "RFI") with respect to the Contract Documents.

(e) *Engineer's Authority.*—The Engineer shall be vested with the authority to judge, determine and direct the following:

(1) Whether products furnished are of the quality, type and kind called for by the Contract Documents and are otherwise acceptable for the Work as provided in the Contract Documents, and if not, to reject those not so qualifying or otherwise unacceptable;

(2) Whether products incorporated in the Work comply with the standards and requirements of the Contract Documents as to installation and operation and, if not, to require their removal and replacement, at the expense of the Contractor, with products which do meet the qualifications and operating ability, requirements, performance and standards as provided in said Contract Documents;

(3) The accuracy of quantities, amount of Work performed and all other submittals by the Contractor submitted in partial or periodic payment estimates, and whether all or any part of such quantities and other submittals are acceptable and comply with the Contract Documents, and to disallow any submittals not approved by the Engineer until the deficiencies causing such disallowance have been eliminated and rectified;

(4) The validity and merit of any and all claims for additional compensation or extension of the Contract Time;

(5) All matters relating to artistic effect;

(6) The validity and reasonableness of any notice of facility interruption given under Article 20 of the General Conditions; and,

(7) All other matters relating to the proper execution of the Work in conformity with the Contract Documents, including workmanship.

The determination and decision, and any resulting approval, non-approval, condemnation, rejection, requirements of removal or replacement in all the foregoing matters of or by the Engineer shall be final and conclusive and binding upon the Contractor, all Subcontractors and all suppliers of products materials and equipment.

(f) *Claims for alleged procrastination.*—No claim for delay to the Contractor or for additional expense to the Contractor shall commence to accrue on account of failure of the Engineer to render decisions, make interpretations, or furnish additional instructions until ten (10) days after receipt of written claim for additional compensation, damages, or extension of time served upon the

Engineer and the Owner and not then unless such claim be reasonable and otherwise permitted under the Contract Documents.

Article 12. - Separate Contracts.—(a) *Cooperation of Contractor.*—The Owner reserves the right to let other contracts in connection with, or related to, this Project. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their products and the execution of their work, and the Contractor and other contractors shall properly connect and coordinate their respective work with each other. If the proper execution or results of any part of the Contractor's Work depends upon the work of any other contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such other contractor's work that render it unsuitable for such proper execution and results.

(b) *Performance of Work by Owner.*—The Owner may perform additional work related to the Project with Owner's own forces. The Contractor shall afford the Owner reasonable opportunity for the introduction and storage of products and the execution of such work and shall properly connect and coordinate Contractor's work with work performed by Owner's own forces.

(c) *Claims for Extra Expense.*—If the performance of additional work by other contractors or the Owner is not noted in the Contract Documents prior to the execution of the Contract, written notice thereof will be given to the Contractor prior to starting any such additional work. If the Contractor believes that the performance of such additional work by the Owner or others causes the Contractor any additional expense or entitles the Contractor to an extension of the Contract Time, the Contractor may make a claim therefor as provided in Article 29 of the General Conditions.

Article 13. - Laws and Regulations. (a) *General.*—The Contractor acknowledges and agrees that all applicable federal, state, county and city laws, municipal ordinances, and the codes, rules, and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract as though written out in full herein. The Contractor shall keep fully informed of all laws, ordinances and regulations of the federal, state, county, city and municipal governments or authorities in any manner affecting those engaged or employed in the Work or the material used in the Work or in any way affecting the conduct of the Work and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over same. If any discrepancy or inconsistency should be discovered in these Contract Documents herein referred to, in relation to any such law, ordinance, regulation, order or decree, the Contractor shall herewith report the same, in writing, to the Owner and the Engineer.

(b) *Expense for Violation of Laws, Ordinances, etc.*—If the Contractor performs any work knowing or reasonably knowing it to be contrary to such laws, ordinances, rules or regulations without such notice to the Owner, the Contractor shall bear all costs arising therefrom.

(c) *Indemnification.*—The Contractor shall at all times observe and comply with all such existing and future laws, ordinances, and regulations, and shall protect and indemnify the Owner, the Engineer and their agents against the violation of any such law, ordinance regulation, order or

decree, whether by the Contractor or by the Contractor's employees or Subcontractors.

(d) *Drug Free Workplace Act.*—The Contractor certifies that the provisions of O.C.G.A. §§ 50-24-1 through 50-24-6 (as may be amended or re-numbered) relating to the "Drug Free Workplace Act" will be complied with in full. The Contractor further certifies that: (i) A Drug Free Workplace will be provided for employees during the performance of the Contract, and (ii) that if a Subcontractor is engaged by the Contractor to work in a Drug Free Workplace, the Contractor shall secure from the Subcontractor the following written certification:

"As part of the subcontracting agreement with _____ (Contractor's name), _____ (Subcontractor's name) certifies to the Contractor that a drug-free workplace will be provided for the Subcontractor's employees during the performance of this Contract pursuant to the 'Drug Free Workplace Act'". Contractor also certifies to the Owner and the Engineer that the Contractor and its employees will not engage in the unlawful manufacture, sale, distribution, dispensation, possession, or use of any controlled substance or marijuana during the performance of the Contract.

(e) *Alcoholic Beverages on the Jobsite.*—The Contractor will strictly enforce a policy prohibiting the possession and consumption of alcoholic beverages on the jobsite before, during or after working hours for duration of the Work.

Article 14. - Taxes. (a) *General.*—The Contractor shall pay all sales, consumer, use and other similar taxes required by the law of the place where the Work is performed. The Owner will be responsible for any sales or use tax due on products furnished by the Owner to the Contractor to be incorporated into the Work.

(b) *Tabulation.*—The Contractor shall provide a written tabulation, plus other documentation as may be required, of all taxes, including sales tax, paid by the Contractor to assist the Owner in obtaining sales 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 (as may be amended). Such written tabulation shall be included with each partial payment request. Additionally, the tabulation shall be documented with copies of invoices indicating the amount of tax paid, with all blanks completed on the invoice, and with a description of the function of the item included in the tabulation. All taxes will be paid by the Contractor. All refunds will accrue to the Owner.

(c) *Tariffs* – "Tariffs" includes applicable tariffs, duties, customs fees, import taxes, or similar charges imposed by a governmental authority. "Tariffs" does not include sales, consumer, use, and similar taxes that are legally enacted by a governmental entity as outlined in subsection (a) above. If the cost of materials and/or equipment increases by more than 10% over the amount estimated in calculating the Contract Price, which increase is directly attributable to Tariffs, Contractor shall promptly provide to Owner or Owner's representative with a written request for an equitable adjustment for an amount above the 10% increase. Prior to Contractor making

such a request, Contractor shall determine whether substantially similar materials and/or equipment may be utilized that is not subject to Tariffs. If no substantially similar materials are available, Contractor may request a Change Order to increase the Contract Price by the difference between the original cost plus the 10% increase due to Tariffs and the actual costs to be paid by the Contractor, without markup or overhead. In no event shall the Contract Price be adjusted by more than 10% over the original Contract Price for the aggregate of all such increases due to Tariffs. Any adjustment of the Contract Price under this provision shall not be duplicated in any contingency amounts established under the terms of the Contract, or by any allowance.

Article 15. - Notice and Service Thereof. (a) *General.*—All notices, demands, requests, instructions, approvals, and claims shall be in writing.

(b) *Notice to Contractor.*—Any notice to or demand upon the Contractor will be sufficiently given if delivered at the office of the Contractor specified in the Bid (or at such other office as the Contractor may from time to time designate to the Owner in writing), or if delivered by the United States Mail in a sealed, postage-prepaid envelope, or delivered by facsimile transmission, followed by written confirmation, in each case addressed to such office.

(c) *Notice to Owner.*—All papers required to be delivered to the Owner shall, unless otherwise specified in writing to the Contractor, be delivered to:

Macon Water Authority
790 Second Street
Macon, GA 31201
FAX (478) 750-2007

Any notice to or demand upon the Owner shall be sufficiently given if delivered to the Office of the Executive Director or if delivered by the United States Mail in a sealed, postage-prepaid envelope, or delivered by facsimile addressed to said Executive Director or to such other representative of the Owner or to such other address as the Owner may subsequently specify in writing to the Contractor for such purposes. Any such notice or demand shall be deemed to have been given to the Owner or made only as of the time of actual delivery to Owner.

(d) *Delivery to Engineer or Resident Inspector.*—Notice in writing or orally to the Engineer or to the resident inspector is not notice to the Owner unless a copy of the aforesaid notice in writing shall have been properly served upon the Owner as provided in this Article.

Article 16. - Patents and Royalties. (a) *General.*—If the Contractor uses any patented, trademarked or copyrighted design, process, device, material or other item, the Contractor shall provide for such use by suitable agreement between the Owner and the holder of such patented, trademarked or copyrighted design, device or material. The Contract Prices shall include royalties

or costs arising from the use of such design, device, or materials, in any way involved in the Work.

(b) *Indemnification.*—The Contractor and the Contractor's surety shall indemnify and save harmless the Owner, the Engineer and their agents from claims for infringement by reason of the use of such patented, trademarked or copyrighted design, process, device or materials in connection with Work agreed to be performed under this Contract, and shall indemnify the Owner, the Engineer and their agents for any cost, expense, damage and reasonable attorneys' fees which the Owner, the Engineer or their agents may be obliged to pay by reason of such infringement, at any time during the prosecution of the Work or after completion of the Work.

Article 17. - Land and Rights-of-Way. (a) *Project Site.*—The Owner will provide, as indicated in the Contract Documents and prior to the Notice to Proceed, the lands upon which the Work is to be performed, rights-of-way for access thereto, and such other lands which are designated for the use of the Contractor. The Contractor shall confine all Work and all associated activities to the easements and other areas designated for the Contractor's use. The Contractor shall comply with any limits on construction methods and practices which may be required by easement agreements.

(b) *Delays in Providing Access.*—If, due to some unforeseen reason, the necessary easements are not obtained, the Contractor shall receive an equitable extension of Contract Time or an equitable increase in the Contract Price, or both, to cover the Contractor's additional costs as a result thereof, provided the Owner is notified in writing of the claim. The Contractor's claim therefor shall be made as provided for in Article 29 of the General Conditions.

(c) *Additional Easements.*—Should additional temporary easements for ingress or egress be required by the Contractor for access to the Work, these easements shall be obtained by the Contractor, at no additional cost to the Owner.

Article 18. - Products. (a) *Storage.*—Products shall be stored in accordance with the manufacturer's recommendations to insure the preservation of their quality and fitness for the Work. Stored products to be incorporated in the Work shall be located so as to facilitate prompt inspection by the Owner or the Engineer.

(b) *Installation.*—Manufactured products shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer.

(c) *Conformance with Shop Drawings.*—Products shall be furnished in accordance with shop drawings or samples submitted by the Contractor and approved by the Engineer.

(d) *Quality and Ownership.*—Unless otherwise specified, all products incorporated into the Work shall be new, and both workmanship and materials shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of products. The burden of proof is on the Contractor. Products to be incorporated into the Work shall not be purchased by the Contractor or Subcontractor subject to a chattel mortgage or under a conditional sale contract or

other agreement by which an interest is retained by the seller.

Article 19. - Supervision of Work. (a) *Supervision by Contractor.*—The Contractor shall give efficient supervision to the Work, using its best skill and attention. The Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

(b) *Superintendent of Contractor.*—The Contractor shall employ and maintain on the Work a qualified superintendent and any necessary assistants, all satisfactory to the Owner and Engineer, who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The superintendent shall not be changed except with the consent of the Owner and Engineer unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in the Contractor's employ. The superintendent shall represent the Contractor and shall be present on the site at all times as required to perform adequate supervision and coordination of the Work. The superintendent's sole responsibility shall be to superintend the construction of the Project; he shall not be a "working foreman." The superintendent shall have full authority to act on behalf of the Contractor and to execute orders or directions of the Engineer without delay. The superintendent shall have full authority to promptly supply products, tools, plant equipment and labor as may be required. The superintendent's authority shall be such that all communication given to the supervisor shall be as binding as if given to the Contractor.

(c) *Contractor's Personnel.*—The Contractor shall employ only competent and skilled personnel. The Contractor shall at all times enforce strict discipline and good order among its employees and shall not employ on the Work any unfit person or anyone not skilled in the work assigned to him. The Contractor shall, upon demand from the Engineer, immediately remove any superintendent, foreman, or worker whom the Engineer or Owner may consider incompetent or undesirable.

Article 20. - Interruption of Facility Operations. (a) *General.*—The Contractor shall provide the Owner with written notice at least five (5) days prior to any interruption in facility operations required by any construction activity. The notice shall include the date and time of the scheduled interruption; the length of time the interruption will be in effect; the procedures to be followed in effecting the interruption; a complete identification of all those processes, equipment and operations to be affected; and all other information the Owner may require. The Contractor shall provide any and all equipment, piping, auxiliary power or other means necessary to sustain facility operations or function for interruptions which have not been identified by the Contract Documents, or when interruptions must exceed the time allowed by the Contract Documents.

(b) *Damages and Fines.*—Any damages resulting from surcharging, overflow or back-up caused by the Contractor's operations shall be the Contractor's responsibility. Any fines levied against the Owner resulting from a surcharge, overflow or backup caused by the Contractor shall be paid by the Contractor.

Article 21. - Protection of Work, Property and Persons. (a) *Duty to Protect Persons and*

Property.—The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The Contractor shall take all necessary precautions for the safety of, and shall provide necessary protection to prevent damage, injury or loss to all employees on the Work and other persons who may be affected thereby, all the Work and all products to be incorporated therein, whether in storage on or off the site, and other property at the site and adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor shall pay for any such damage, injury, or loss except such as may be directly the result of errors in the Contract Documents or such as shall be caused directly by agents or employees of the Owner.

(b) *Safety Precautions.*—The Contractor shall comply with the Occupational Safety and Health Act, the Contract Work Hours and Safety Standards Act, and all rules and regulations relating thereto. Contractor warrants and represents that it is thoroughly familiar with the safety requirements with regard to scaffolding set forth in O.C.G.A. § 25-15-110, the requirements concerning blasting or excavating near underground gas pipes and utility facilities contained in O.C.G.A. § 25-9-1, *et seq.*, and the High Voltage Safety Act, O.C.G.A. § 46-3-30, *et seq.*, and that the Work shall be prosecuted in complete accord with all limitations and requirements set forth in these, and other applicable, laws. The contractor's operation of the jobsite shall be consistent with the provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work arising out of and in the course of employment on the Work. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of its plant, appliances, and methods and for any damage which may result from their improper construction, maintenance, or operation. The Contractor shall erect and properly maintain at all times as required by the conditions and progress of the work proper safeguards for the protection of workers and the public and shall post danger warnings against any hazards created by the construction operations. The Contractor shall designate a responsible member of its organization on the Work whose duty shall be the prevention of accidents. In the absence of notice to the contrary filed with the Engineer in writing with a copy to the Owner, this person shall be the superintendent of the Contractor.

(c) *Emergencies.*—In an emergency affecting the safety of life or the Work or adjoining property, the Contractor, without special instruction or authorization from the Engineer or Owner, is hereby permitted to act, at its discretion, to prevent such threatened loss or injury. Any remuneration claimed by the Contractor on account of emergency work shall be determined in accordance with allowances permitted on force account under section (c), Case(c) of Article 29 of the General Conditions.

(d) *Injury or Loss to Persons or Property.*—The Contractor shall remedy all damage, injury or loss to any property, improvements or facilities caused, directly or indirectly, in whole or in part, by the Contractor or any of the Contractor's Subcontractors or anyone directly or indirectly employed by and of them or anyone for whose acts any of them may be liable. The property,

improvements or facilities 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 pay for such damages or injury, the Owner may, after 48 hours written notice, 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 to the Contractor under this Contract.

(e) *Blasting.*—In the absence of an express provision in the Contract Documents permitting blasting, there shall be no blasting. If blasting is permitted under the Contract Documents and under the law which is applicable to the Project site, such blasting shall be done in such manner as to prevent all damage and injury.

(f) *Rain Water, Surface Water, and Backup.*—The Contractor shall protect all Work, including but not limited to excavations and trenches, from rain water, surface water, and back-up of drains and sewers. The Contractor shall furnish all labor, pumps, shoring, enclosures, and equipment necessary to protect and keep the Work free of water. Completed Work and stored products shall be suitably protected during inclement weather to allow Work to proceed in a timely fashion. Work planned, or in progress, should be performed to minimize impact of adverse weather conditions.

Article 22. - Protection of the Environment. (a) *General.*—The Contractor shall be responsible for taking all measures required to minimize all types of pollution associated with the undertaking of the proposed Work, and shall abide by the requirements of all governmental agencies having jurisdiction over the Work or Contractor's Project operations.

(b) *Restoration.*—Any area used or involved in the Project that is disturbed by the Contractor, shall be restored to original or better condition, even though such area is outside the limits of that specified for grading, grassing or landscaping.

Article 23. - Protection, Location and Relocation of Utilities. (a) *Notification and Protection.*—The Contractor shall notify owners of adjacent utilities when prosecution of the Work may affect them. The Contractor shall protect from damage all existing improvements or utilities at, or in proximity to, the site of the Work, and shall repair or restore any damage to such facilities resulting from the performance of the Work. If the Contractor fails or refuses to repair any such damage promptly, the Owner may have the Work performed and charge the cost thereof to the Contractor.

(b) *Relocation.*—Prior to the construction or installation of any proposed facility or pipeline, the Contractor shall expose all existing utilities true to their vertical and horizontal location, within the vicinity of the Work. In order to avoid conflicts between existing and proposed facilities or utilities, the Contractor shall either relocate the existing or proposed utility on a temporary or permanent basis, or shall take whatever means necessary to protect the existing facilities or utilities during the installation of proposed utilities, as approved by the Engineer. No separate or additional payment will be made for the relocation of existing utilities or for any work associated with the

protection of existing facilities or utilities.

Article 24. - Schedules, Reports and Records.—(a) *Progress Reports.*—Within such reasonable time as the Owner shall designate in writing, the Contractor shall submit to the Owner such schedule of quantities and costs, construction progress schedules, payrolls, bills, vouchers, correct copies of all subcontracts, statements, reports, correct copies of all agreements, correspondence, and written transactions with the surety that have any relevance to the Work, estimates, records, and other data as the Owner may request concerning Work performed or to be performed under this Contract. When requested by the Owner, the Contractor shall give the Owner access to accounts relating to the foregoing. The above reports shall include but are not limited to (i) written notice of dates by which specified Work will have been completed, (ii) written notice of dates by which condemned Work shall have been remedied, (iii) written notice that condemned Work has been remedied, (iv) written notice as to the date or dates by which Work that has not been performed with equal steps and at the same rate required by the construction progress schedule shall have been brought into conformity with the schedule, (v) written notice of the date by which any undisputed claim of a Subcontractor, materialman, or laborer shall have been paid, (vi) written advice regarding the nature and amount of any disputed claim of a Subcontractor, materialman, or laborer, and (vii) information regarding work performed under Sections (c), Case (b) and Case (c) of Article 29 of the General Conditions.

(b) *Construction Progress Schedule.*—Within ten (10) days of the Notice to Proceed, the Contractor shall submit to the Engineer a Preliminary Progress Schedule ("PPS") and a Near Term Schedule ("NTS") in the form and with the content required by the Specifications. Within forty-five (45) days of the Notice to Proceed, the Contractor shall submit to the Engineer the Overall Project Schedule ("OPS") as required in the Specifications.

(c) *Schedule of Values.*—The Contractor shall, within ten (10) days of the Notice to Proceed, submit to the Engineer a Schedule of Values of the various parts of the Work, including quantities, aggregating the total Contract Price, divided in such manner as to facilitate payments to Subcontractors in accordance with Article 10, with a complete breakdown of the Contract Price so arranged and so itemized in accordance with the Specifications as to meet the approval of the Engineer, and, if requested, supported by such evidence as to its correctness as the Engineer may direct. This schedule, designated herein as the Schedule of Values, when approved by the Engineer shall be used as a basis for certificates of payment.

(d) *Shop Drawings.*—The Contractor shall prepare, execute, and submit shop drawings as required by the Specifications. No shop drawings shall be submitted which do not comply with the Contract Documents.

(e) *Schedule of Submittals.*—Within ten (10) days of the Notice to Proceed, the Contractor shall prepare and submit for the approval of the Engineer a Schedule of Submittals showing the estimated date of submittal of all shop drawings and the desired approval date for each shop drawing anticipated. The Contractor shall submit in accordance with the schedule and the Engineer

shall furnish approval in accordance with the schedule. The schedule must be consistent with the construction progress schedules.

(f) *Submitting Updated Schedules.*—An updated OPS and NTS together with an updated Schedule of Submittals shall be presented with each periodical payment request. Failure to timely submit such schedules will delay processing of the pay request until receipt of the updated schedules.

(g) *Float in the Schedule.*—If the OPS reflects a completion date prior to the completion date established in the Contract Agreement, or as extended by Change Order, this shall afford no basis for a claim of delay should the Contractor not complete the Work prior to the projected date set forth in the OPS. All "float" between the completion date in the OPS and the completion date established in the Contract Agreement shall belong to and be exclusively available to the Owner. Should a Change Order be executed with a revised completion date, the progress schedule shall be revised to reflect the new completion date.

(h) *Record Drawings.*—The Contractor shall maintain on the Project site throughout the Contract Time an up-to-date set of records and drawings as required by the Specifications.

(i) Project Coordination Meetings.—The Contractor shall participate in Project Coordination Meetings to be held on the site monthly, or more often if conditions warrant, to establish the current state of completion and revise the schedule as necessary. The Project Coordination Meeting will be conducted by the Owner and the Engineer.

(j) *Maintenance of Project Scheduling System.*—The Contractor shall take the following steps to ensure that the Project stays on schedule:

(1) The Contractor shall implement the detailed NTS of activities to the fullest extent possible between Project Coordination Meetings.

(2) The Contractor shall provide a copy of the Contractor's Daily Report to the Resident Inspector by 10:00 a.m. of the day following the Report date. This Daily Report will contain, as a minimum, the weather conditions; number of workers by craft, including supervision and management personnel on site; active and inactive equipment on site; Work accomplished by Critical Path Method activity item; problems; and visitors to the jobsite.

(3) If a current activity or series of activities on the OPS is behind schedule and if the late status is not due to an excusable delay for which an extension of the Contract Time would be forthcoming, the Contractor shall attempt to reschedule the activity to be consistent with the OPS so as not to delay completion of the Contract. The Contractor agrees that:

a. The Contractor shall attempt to expedite the activity to completion so as to have it agree with the OPS. Such measures as the Contractor may choose shall be made explicit during the Project Coordination Meeting;
b. If, within two weeks of identification of such behind-schedule activity, the Contractor is not successful in restoring the activity to an on-schedule status, the Contractor shall:
    1. Carry out the activity with the scheduled crew on an overtime basis until the activity is complete or back on schedule;
    2. Increase the crew size or add shifts so the activity can be completed as scheduled; or,
    3. Commit to overtime or increased crew sizes for subsequent activities, or some combination of the above as deemed suitable by the Engineer.

    These actions shall be taken at no increase in the Contract Price.

(4) Maintain a current copy of all construction schedules on prominent display in the Contractor's field office at the Project site; and,

(5) Cooperate with the Owner or Owner's representative in all aspects of the Project Scheduling System. Failure to implement the Project Scheduling System or to provide specified schedules, diagrams, and reports, or to implement actions to re-establish progress consistent with the OPS may be causes for withholding of payment.

Article 25. - Drawings and Specifications.

(a) *Identification.*— The Contract Documents shall be as defined in Article 41(e) of the General Conditions. They are intended to define, describe, and provide for all Work necessary to complete the Project in an acceptable manner, ready for use, occupancy, or operation by the Owner. Insertion, addition, alteration, modification, revision, or deletion of any text, verbiage, provision, statement, term, condition, or other component of the Contract Documents, whether textual, numerical, or pictorial, is prohibited and no such unilateral change to the Contract Documents shall be binding.

(b) *Number of Copies.*—The Engineer will furnish the Contractor two copies of the Contract Documents, one copy of which the Contractor shall have available at all times on the Project site. Any additional copies will be furnished at additional cost.

(c) *Correlation and Intent.*—The Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all. The intention of the documents is to include all labor and materials, equipment, and transportation necessary for the proper execution of the Work. It is not intended, however, that materials or work not covered by or properly inferable from any heading, branch, class, or trade of the Specifications shall be supplied unless distinctly noted on the drawings. Materials or Work described in words which so applied have a well-known technical or trade meaning shall be held to refer to such recognized standards. In the event the Engineer shall

have used such phrases anywhere in the Specifications as: "work indicated on the drawings and herein specified", "work shown and specified", "in accordance with the drawings and Specifications", "indicated on the drawings and Specifications", "in accordance with Specifications and applicable drawings", "these Specifications and the accompanying drawings", "as indicated on the drawings and as specified herein", or similar expressions, they shall not be deemed to be and are not a defeasance of the provisions under this Article of the General Conditions, and they are not to be construed as requiring Work to be called for both in the Specifications and in the drawings in order to be a requirement under the Contract. Any of the aforesaid conjunctive expressions and phrases or any cross-references between drawings and Specifications, between Specifications and Specifications, or between drawings and drawings to the contrary notwithstanding, the Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all.

(d) *Refinement of Documents.*—The Contractor shall do no Work without complete, definite, and clear Drawings and Specifications. In the event the Contract Documents are not complete, definite, and clear, the Contractor shall make demand upon the Engineer, in writing, for a Request for Instructions (RFI) in accordance with Section (d) (iii) of Article 11 of the General Conditions. A copy of such demand shall be served upon the Owner. With reasonable promptness the Engineer shall furnish complete, definite, and clear instructions in writing, or by means of drawings, or in writing and by means of drawings. Such additional instructions if given orally shall be confirmed in writing or by drawings or both within a reasonable time. All such additional instructions shall be consistent with the Contract Documents, true developments thereof, and reasonably inferable therefrom. The Work shall be executed in conformity with the aforesaid instructions. The Engineer shall furnish the Owner a copy of all additional instructions issued to the Contractor. No clarification of the Drawings and Specifications hereunder by the Engineer will entitle the Contractor to any additional monies unless a Change Order has been processed as provided by Article 29 of the General Conditions.

(e) *Conflicts.*—The following principles shall govern the settlement of disputes which may arise over conflicts in the Contract Documents:

(i) as between figures given on drawings and the scaled measurements, the figures shall govern;

(ii) as between large-scale drawings and small-scale drawings, the larger scale shall govern;

(iii) As between Drawings and Specifications, the requirements of the Specifications shall govern;

(iv) as between the form of the Contract Agreement, General Conditions or agency funding documents, the requirements of the agency funding documents shall govern; and,

(v) in cases where products or quantities are omitted from the Specifications, the

description and quantities on the Drawings shall govern.
Conflicts noted shall be reported to the Engineer. The principles set forth herein shall not alter the provisions of subsection (c) herein. Schedules, lists, indexes, tables, inventories, written instructions, written descriptions, summaries, statements, classifications, specifications, written selections, or written designations although appearing on the drawings are deemed to be and are "Specifications" within the meaning of this Article.

(f) *Materially Differing Site Conditions.*—Any materially differing site condition as between what is shown on the Drawings and Specifications and actually found on site shall be immediately reported to the Engineer and Owner, in writing, prior to the continuance of Work at the site. Failure of the Contractor to notify the Engineer, in writing, of the differing site condition prior to performance of Work at the site shall constitute a waiver of any claim for additional monies. Any Change Order necessitated by the differing site condition shall be processed as provided under Article 29 of the General Conditions. Any Work done by the Contractor following a discovery of such differing site condition or ambiguity or need for clarification in the Contract Drawings and Specifications, prior to a written report to the Engineer, shall not entitle the Contractor to additional monies and shall be done at the Contractor's risk.

Article 26. - Surveys and Permits.—(a) *Surveys.*—The Owner will furnish a land survey to establish a base line for locating the principal component parts of the Work, as shown in the Contract Documents. A bench mark will be otherwise specified in the Contract Documents; the Contractor shall develop and make all detailed surveys needed for construction, such as alignment, slope stakes, batter boards, stakes for pile location and other working points, lines, elevations and cut sheets.

(b) *Permits.*—Permits and licenses of a temporary nature necessary for the prosecution of the Work shall be obtained and paid for by the Contractor. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be obtained and paid for by the Owner unless otherwise specified.

Article 27. - Testing, Inspection and Rejection of Work.—(a) *Testing of Materials.*—Unless otherwise specifically provided for in the Specifications, the inspection and testing of materials and products to be incorporated in the Work at the site shall be made by bureaus, laboratories, or agencies approved by the Owner; the cost of such inspection and testing shall be paid by the Contractor. The Contractor shall furnish evidence, satisfactory to the Owner and Engineer, that the materials and products have passed the required tests prior to their incorporation into the Work. The Contractor shall promptly segregate and remove rejected materials and products from the site of the Work.

(b) *Access to Work.*—The Owner and Engineer and their representatives shall at all times have access to the Work wherever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and for inspection.

(c) *Notice to Engineer from Contractor Prior to Covering Work.*—If the Specifications, the Engineer's instructions (either in the Specifications or issued later in writing), laws, ordinances or any public authority require any Work to be specially tested or approved, the Contractor shall give the Engineer timely notice in writing of its readiness for inspection, and if the inspection is by any authority other than the Engineer, of the date fixed for such inspection. Inspections by the Engineer shall be made promptly and where practicable at the source of supply. If any Work should be covered without approval or consent of the Engineer, it must, if required by the Engineer, be uncovered for examination at the Contractor's expense.

(d) *Re-examination or Re-testing of Work Covered pursuant to Consent of Engineer.*—Re-examination or re-testing of questioned work covered pursuant to consent of the Engineer may be ordered by the Engineer, and if so ordered the Work must be uncovered by the Contractor. If such Work is found in accordance with the Contract Documents the Owner shall pay the cost of re-examination and replacement or of re-testing. If such Work is found not in accordance with the Contract Documents the Contractor shall pay such cost unless he shall show that the defect in the Work was caused by another contractor of the Owner, and in that event the Owner shall pay such cost. Re-examination or re-testing under the terms of this section applies only to Work which has been covered with consent of the Engineer. Work covered without consent of the Engineer must be uncovered for examination as provided under Article 27(c) of the General Conditions.

(e) *Inspection Does Not Relieve Contractor.*—Under the Contract Documents, the Contractor has assumed the responsibility of furnishing all services, labor, and materials for the entire Work in accordance with such documents. No provisions of this Article or any inspection of the Work by the Owner, representatives of the Owner, resident inspector, clerk-of-the-works, architects employed by the Engineer, representatives of the Engineer, or the Engineer shall in any way diminish, relieve, or alter said responsibility and undertaking of the Contractor; nor shall the omission of any of the foregoing to discover or to bring to the attention of the Contractor the existence of any Work or materials injured or done not in accordance with said Contract Documents in any way diminish, relieve, or alter such obligation of the Contractor nor shall the aforesaid omission diminish or alter the rights or remedies of the Owner as set forth in the Contract Documents. Subject to the provisions of Section (g) herein, the resident inspector has no power to make decisions, to accept or reject Work, or to consent to the covering of Work. The resident inspector owes no duty to the Contractor.

(f) *False Start.*-In the event notice of readiness pursuant to Article 30(g) of the General Conditions shall have been issued prematurely by the Contractor, the Contractor's action shall be deemed to be a "false start", and the Contractor shall be liable for the damage resulting from the aforesaid false start, including but not limited to the salary, professional fees, and travel and living expenses of the person or parties inconvenienced by the aforesaid false start.

(g) *Authority and Duties of the Resident Inspector*.—The Resident Inspector will be authorized to inspect all Work done and all products furnished, including preparation, fabrication and manufacture of the products to be used, but the Resident Inspector is not authorized to alter or

waive any requirements of the Contract Documents. The Resident Inspector may temporarily reject products or suspend the Work until any question at issue can be referred to and decided by the Engineer. The responsibility of the Contractor is not lessened by the presence of the Resident Inspector.

(h) *Rejection of Work; Orders of Condemnation.*—The Contractor shall remove from the premises within the time designated in orders of condemnation all Work condemned by the Engineer as failing to conform to the Contract Documents, whether incorporated in the Work or not, and the Contractor shall promptly replace and re-execute the Work in accordance with the Contract Documents and without expense to the Owner and shall bear the expense of making good all work of other contractors destroyed by such removal or replacement. The Contractor shall supply any omitted Work and perform all unexecuted Work within the time fixed by the Engineer in orders of condemnation.

(i) *Remedy of the Owner for Breach of Order of Condemnation.*—If the Contractor does not make good a deficiency within the time fixed in an Order of Condemnation, the Owner may:

(1) Remove the condemned Work and store it at the expense of the Contractor. If the Contractor does not pay the expenses of such removal and storing within ten (10) days after receipt of written demand of the Owner, the Owner may upon three (3) days' notice in writing to the Contractor sell such materials at private sale or at auction and shall account for the net proceeds thereof after deducting all proper costs incurred by the Owner; or

(2) Supply omitted Work, perform unexecuted Work, or replace and re-execute Work not done in accordance with the methods and materials designated in the Contract Documents and deduct the cost thereof from any payment then or thereafter due the Contractor; or,

(3) Accept the condemned Work and deduct the reasonable value of such Work from the Contract Price.

The remedies stated in this Article are in addition to the remedies otherwise available to the Owner, do not exclude such other remedies, and are without prejudice to any other remedies. Time limits stated in orders of condemnation are of the essence of the Contract. Unless otherwise agreed to by the Owner in writing, the making good of condemned Work shall physically commence at the site in not more than seven (7) days after receipt of the Order of Condemnation except that in case of emergency correction shall physically commence immediately and except that the Contractor shall in any event physically commence the correction at the site early enough to complete within the time allowed in the Order of Condemnation. The Owner shall give prompt consideration to reasonable requests for delay in commencement of the making good of orders of condemnation. The making good of condemned Work shall be completed within the time allowed in the Order of Condemnation unless the Contractor shall have requested from the Engineer an increase in the

amount of time allowed and the Engineer shall have given notice to the Contractor in writing, with copy to the Owner, stating the additional time, if any, allowed. An extension of the time allowed to correct condemned Work shall not extend the Contract Time.

(j) *Notice of Correction from Contractor.*—The Contractor shall give prompt notice in writing to the Engineer, with copy to the Owner, upon completion of the correction of any Work, the supplying of any omission of any Work or materials or the performance of any unexecuted Work condemned by the Engineer. In the absence of such notice, it shall be and is presumed under this Contract that there has been no correction, supplying remedy, or performance of unexecuted Work.

Article 28. - Contract Time and Liquidated Damages. (a) *Rate of Progress.*—The Contractor shall proceed with the Work at a rate of progress which will insure substantial completion of the Project within the Contract Time. It is expressly understood and agreed by and between the Contractor and the Owner that the Contract Time for the Work is a reasonable time, taking into consideration the average climatic and economic conditions, and other factors prevailing in the locality of the Work. It is understood that the Contractor's proposed construction schedule is based on a normal 40-hour work week, less recognized holidays. If the Contractor desires to work in excess of a normal 40-hour work week, the Contractor shall submit a written request to the Owner and Engineer a minimum of two (2) days prior to the desired work date. The Contractor shall be responsible for any additional expenses incurred by the Owner as a result of any extended work hours, including resident inspection overtime. The cost associated with resident inspector overtime will be deducted from the Contractor's monthly progress payment request.

(b) *Grounds for Delays and Extensions of Time.*—If the Contractor be delayed at any time in the progress of the Work by any act or neglect of the Owner or the Engineer, or of any employee of either, or by any separate contractor of the Owner, or by changes ordered in the Work, or by strikes, lockouts, pickets, abnormal and unforeseeable weather, unforeseeable subsurface conditions, fire, unusual delay in transportation, unavoidable casualties, or any causes beyond the Contractor's control, or by any cause which the Engineer shall decide to justify the delay, then the Contract Time may be extended for such reasonable time as the Engineer may decide.

(c) *Filing of Claims.*—No extension of the Contract Time shall be made for delay occurring more than ten (10) days before claim therefor is made in writing to the Engineer with a copy to the Owner. In the case of a continuing cause of delay, only one claim is necessary, but no claim for a continuing delay shall be valid unless the Contractor, within ten (10) days of the commencement of the delay, shall have given notice in writing to the Engineer, with copy to the Owner.

(d) *Weather Delays.*—The Contractor is held to be familiar with weather conditions in the Macon-Bibb County area. When a claim for extension of the Contract Time is based on abnormal and unforeseeable weather conditions the request must be accompanied by U.S. Weather Bureau data for the past ten (10) years for the Macon/Macon-Bibb County, Georgia area that substantiates the claim of abnormal and unforeseeable weather conditions. Each day of inclement weather is not, by itself, reason for an extension of the Contract Time. Extensions of the Contract Time will be

based solely on the number of rain days in a monthly period that are in excess of the ten (10) year average as established for the Macon/Macon-Bibb County area. A rain day, for purposes of calculating the ten (10) year average, is defined as a day in which 0.10 inch of rain or more was measured by the Weather Bureau.

(e) *Delay in Furnishing Drawings.*—If no Schedule of Submittals or agreement stating the dates upon which drawings or approval of shop drawings shall be furnished is made, then no claim for delay shall be allowed on account of failure of the Engineer to furnish drawings or approval of shop drawings until fourteen (14) days after demand therefor and not then unless such claim be reasonable.

(f) *No Damages for Delay.*—In the event of any delay as set forth in Section (b) herein, the Contractor may be entitled to an extension of the Contract Time only, and shall not be entitled to any additional payment on account of such delay. Without limiting the foregoing, except as otherwise specifically provided under Article 29, the Contractor shall not be entitled to payment or compensation of any kind from the Owner for direct, indirect or impact damages, including but not limited to costs of acceleration or extended home office overhead arising because of hindrance or delay from any cause whatsoever, whether such hindrances or delays be reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable.

(g) *Liquidated Damages.*—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 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 shall have expired, and the Owner shall deduct such liquidated damages from the Contractor's monthly progress payment request.

Article 29. - Changes in the Work.—(a) *Owner's Right to Make Changes.*—The Owner without invalidating the Contract may authorize or order extra work or may authorize or order changes by altering, adding to, or deducting from the Work, the Contract Price or the Contract Time, or both, being adjusted accordingly. The Contractor hereby expressly agrees that the Contractor shall have no right to a claim for damages or extended overhead of any nature because of changes made by the Owner. Such Work is hereinafter designated "change" or "changes".

(b) *Field Orders.*—The Engineer may at any time, by issuing a field order, make changes in the details of the Work. These changes by field order will not affect Contract Time or Contract Price. The Contractor shall proceed with the performance of any such changes in the Work so ordered by the Engineer, unless the Contractor believes that such field order entitles Contractor to a change in Contract Price or Contract Time, or both, in which event Contractor shall give the Engineer immediate, written notice thereof and if required by the Owner, an immediate estimate of the direct cost of Work as outlined in Case (b) below, after the receipt of the ordered change, and the Contractor shall not execute such changes pending the receipt of an executed Change Order or further written instruction from the Owner.

(c) *Cost to Owner for Changes.*—The cost to the Owner of any change shall be determined in one or more of the following ways:

CASE (a) By estimate and acceptance in a lump sum.

CASE (b) By unit prices identified in the Contract or subsequently agreed upon. Unit prices are net including overhead and profit. Neither establishment of unit prices in the Contract or later agreement to unit prices shall entitle the Contractor to execute any change under Case (b) prior to issuance of an authorization or order of the Owner in writing.

CASE (c) By force account, which is defined as expenditures allowed under Article 29(i) plus a percentage or percentages as stated under Article 29(i).

(d) *Changes Forbidden without Consent of Owner.*—Neither the Engineer or the Contractor shall make any change whatsoever in the Work without authorization or order of the Owner in writing except in emergency as described hereinbelow. The making of any change without authorization or order of the Owner in writing is a breach of contract except in emergency as referred to under Article 21 of the General Conditions. In the absence of authorization or order of the Owner given in advance in writing (except in emergency as referred to under Article 21 of the General Conditions) the Contractor shall have no claim for payment, repayment, reimbursement, remittance, remuneration, compensation, profit, cost, overhead, expense, loss, expenditure, allowance, charge, demand, hire, wages, salary, tax, cash, assessment, price, money, bill, statement, dues, recovery, restitution, benefit, recoupment, exaction, injury, damages or time based upon or resulting from any change.

(e) *Notice of demand of Contractor for extraordinary remuneration or for damages.*—For a change in the Work, the Contractor shall be entitled to no claim other than or in excess of allowances permitted under Article 29(i) unless prior to commencement of execution of the change (a) the Contractor shall have notified the Owner in writing of the nature of the claim and (b) the Owner shall have agreed in writing to the claim. Commencement of execution of a change authorized by the Owner in the absence of the aforesaid written notice from the Contractor and written agreement to the claim by the Owner shall be deemed to be and is conclusive proof that the Contractor acknowledges that it makes no claim other than or in excess of allowances permitted under Article 29(i).

(f) *Subsurface Conditions.*—Material below the surface of the ground is assumed to be earth and other material that can be removed by a backhoe or similar equipment. Should conditions encountered below the surface of the ground be at variance to conditions indicated by Drawings, Specifications, or geotechnical reports, and subject to Article 23 of the General Conditions, the Contract Price may be adjusted as provided in this Article for changes in the Work upon claim by either party made in writing within a reasonable time after the first observance of the conditions;

PROVIDED, however, that the Contractor shall in any event give written notice to the Owner before proceeding to execute any change resulting from subsurface conditions; and PROVIDED FURTHER; that the Owner shall not be liable to the Contractor for any claim occasioned by the aforesaid subsurface conditions except in accordance with and pursuant to authorization of the Owner issued in writing prior to commencement of execution of the aforesaid change to which authorization the Contractor shall have taken no exception. If exception to the authorization be taken by the Contractor, the Owner may issue an order pursuant to Article 29(i). Commencement of execution of work pursuant to Article 29(i) shall not exclude the recovery of damages by the Contractor under other Articles of the General Conditions, but the cost to the Owner for the changes executed pursuant to the aforesaid order shall not exceed the "net allowable expenditures" permitted to the Contractor under Article 29(i) plus the "allowance for overhead and profit" permitted under Article 29(i).

(g) *Rock.*—If rock, as hereinafter defined, is encountered, no claim for additional compensation for changes shall lie against the Owner in the absence of previous authorization by the Owner in writing, and the cost to the Owner for any changes shall be determined as provided in this Article. ***CAUTION: No rock for which extra compensation is expected to be received shall be removed except pursuant to and in conformity with a written authorization or order of the Owner.*** Shale, rotten stone, or stratified rock that can be loosened with a pick or removed by a backhoe or similar equipment shall not be classified as rock. Rock is defined as follows: any material which cannot be excavated with conventional equipment, and must be removed by drilling, chemical cracking, or blasting, and occupies an original volume of at lease one-half cubic yard.

(h) *Existing Conditions.*—The Contractor in undertaking the Work under this Contract is assumed to have visited the premises and to have taken into consideration all conditions which might affect the Work. No consideration will be given any claim based on lack of knowledge of existing conditions except where existing conditions are such as cannot be readily ascertained. Any claims relating to conditions which were not readily ascertainable shall be adjusted as provided in this Article for changes in the Work.

(i) *Cost to Owner, Allowances for Contractor, and Allowable Expenditures.*—In Cases (a) and (c), above, the "allowance for overhead and profit" combined, included in the total cost to the Owner, shall be based upon the following schedule:

(1) For the Contractor an allowance for Work which it performs with its own forces, not to exceed 16% of its "net additional allowable expenditures", if any, for changes.

(2) For a Subcontractor an allowance for Work which it performs with its own forces, not to exceed 16% of its "net additional allowable expenditures", if any, for changes. A Subcontractor shall receive no allowance for overhead and profit on Work not performed by its own forces. Under these Contract Documents, the forces of a Sub-subcontractor of a Subcontractor are deemed to be and are the

forces of the Subcontractor.

(3) For the Contractor an allowance for Work performed by its Subcontractor, not to exceed 10% of the amount, if any, due the Subcontractor for changes.

The above percentages shall be applied to the "net additional allowable expenditures", if any, as limited and defined herein. If the net difference between "allowable expenditures" and savings results in a decrease in expenditures, the amount of credit allowed the Owner shall be the net decrease without any credit for profit and overhead. "Net additional allowable expenditures" as used herein shall mean the difference between all "allowable expenditures" and savings. The term "allowable expenditures" is limited to and defined as items of:

(1) Labor which is defined as the specific labor wages including a thirty percent (30%) markup on the cost of direct payroll wages. The Contractor shall furnish, if required by the Owner, certified payrolls to verify wages.

(2) Material delivered and used on the designated Work, including sales tax, if paid for by the Contractor and as verified by original invoices or otherwise verifiable to the Engineer's acceptance.

(3) Rental, or Ownership cost of equipment, including necessary transportation of equipment, having a purchase value in excess of $300.00. Rental or Ownership cost will be allowed for only those hours during which the equipment is required on the Project site. Cost allowances will not exceed the rates defined as follows: the hourly rate, for equipment not used exclusively in the change to the scope of Work, will be the monthly rate, as printed in the current Rental Blue Book for Construction Equipment published by Dataquest, divided by 176; the rate, for equipment used exclusively for those tasks identified in the change to the scope of Work, will be the daily, weekly or monthly rate, used singularly or in combination, which will provide the lowest total cost. The rates will be modified by the Rate Adjustment Table factors to reflect a depreciation allowance indexed to the year a machine was originally manufactured and sold. The rates will be adjusted to account for regional differences in annual use hours, cost of labor, freight, taxes, etc. The amount by which basic rates will be increased or decreased is shown on the adjustment maps included in the "Blue Book". The equipment use period will begin only at the time equipment is unloaded at the site of the changed Work; will include each day that the equipment is required at the site of the changed Work; and will terminate at the end of the day on which the use of such equipment becomes unnecessary, plus reasonable transportation time. The maximum time to be paid per day will not exceed eight hours unless the equipment is in operation for a longer time. The time which will be paid for per day for equipment not used exclusively in the change to the scope of Work, will be the hours which the equipment was actually in operation on the changed Work.

(4) In cases where there is an extension of the Contract Time, *pro rata* expenditures for time of foremen employed in the direct superintendence of productive labor in execution of changes.

All expenditures not included in the term "allowable expenditures" as limited and defined in this Article shall be considered as overhead, including, but not limited to, bond premiums, supervision, travel (meals, transportation, and lodging), superintendence [except *pro rata* time of foremen as referred to herein], timekeepers, clerks, watchmen, hand tools, small tools, incidental job burdens, engineering, drafting, and office expense. Any other provisions in the Contract Documents to the contrary notwithstanding, only demonstrable, direct, out-of-pocket expenditures for the changes plus percentages as set forth hereinabove shall be allowable for changes. No wages of a foreman shall be allowable for a change carried on concurrently with contract Work unless the claim includes a demand for extension of time caused by the authorizing or ordering of the change.

(j) *Execution of Changes Pursuant to Order.*—In the event neither Case (a) nor Case (b) can be mutually agreed upon as the method of determining the cost to the Owner for a change, the Contractor, provided it receives a written order from the Owner, shall proceed on force account under Case (c), and he shall keep and present in such form as the Engineer may direct a correct account of the expenditures together with vouchers. Allowable expenditures shall in no event exceed current costs for like services and materials, the burden of proof being on the Contractor.

(k) *Stipulated Maximum Sum.*—Under Case (b) and Case (c), the Owner shall prescribe the limits of any authorization or order for a change by means of an authorization or order in writing stipulating the maximum sum of money committed toward execution of the said change, and the Contractor shall have no authority to perform any change which will cost the Owner in excess of the stipulated maximum sum. It shall be solely the Contractor's responsibility ***to apply in writing to the Owner, NOT [repeat NOT] to the Engineer***, for an enlargement of the scope of the authorization or order by an increase in the said stipulated maximum sum if during the course of the performance of a change on force account under Case (c) the additional cost of the change to the Owner as established in accordance with allowable expenditures and allowances for profit and overhead permitted under Article 29(i) is approaching, or may exceed, the said stipulated maximum sum. It shall likewise be the responsibility of the Contractor to apply for an enlargement of the scope of the authorization or order if the total value of units at any agreed unit price under Case (b) is approaching the said stipulated maximum sum. For changes in the Work no claim for payment, repayment, reimbursement, remittance, remuneration, compensation, profit, cost, overhead, expense, loss, expenditure, allowance, charge, demand, hire, wages, salary, tax, cash, assessment, price, money, bill, statement, dues, recovery, restitution, benefit, recoupment, exaction, injury or damages shall lie against the Owner for any amount in excess of such amount as shall have been mutually agreed to under Case (a) or in excess of such amount as shall have been established as the stipulated maximum sum under Case (b) or Case (c). The cost to the Owner for any change in the Work, except a change based upon agreed unit prices under Case (b), shall be established in accordance with the schedule of allowances and percentages stipulated under Article 29(i).

(l) *Breakdown of Expenditures.*-To accompany all Change Orders, the Contractor shall furnish a breakdown of expenditures for labor and materials by units and quantities in the form prescribed by the Owner, and the breakdown shall be accompanied by the following declaration: "I do solemnly swear, under criminal penalty, that the costs shown hereinabove do not exceed current costs for like services or materials and do not exceed the actual costs to the Contractor therefor, and that the quantities shown do not exceed actual requirements." For all force account changes, the Contractor shall promptly, and in no event later than thirty (30) days after receipt of written demand therefor, pursuant to Article 29(i) submit to the Engineer a complete, accurate, and final breakdown and account together with vouchers, showing all expenditures and percentages allowable under Case (c). For all unit price changes, the Contractor shall promptly, and in no event later than thirty (30) days after receipt of written demand therefor, pursuant to Article 29(i) submit to the Engineer an accurate account of the quantity of Work performed under Case (b). In any case, the Engineer shall certify to the amount [including under Case (a) and Case (c) the allowance prescribed in the Contract for overhead and profit] due the Contractor. The Contractor shall obtain and furnish as back-up to the Contractor's breakdown a separate breakdown for each Subcontractor's charges prepared by each Subcontractor on the letterhead of the Subcontractor and properly signed by the Subcontractor.

(m) *Payment on Account.*—If the Contractor desires to obtain payment on account before any change in the Work has been completed, a Change Order certified by the Engineer and signed by the Contractor and the Owner must have been executed for so much of the change as has been completed at the time of the filing of the request for payment on account.

(n) *Form and Execution of Change Orders.*—Change Orders shall be recommended by the Engineer and signed by the Contractor and the Owner in accordance with the form of change order prescribed by the Owner. No request for payment of the Contractor for account of a change shall be due, nor shall any such request appear on a progress payment request or demand for final payment until (1) the Change Order shall have been certified by the Engineer and (2) a Change Order shall have been executed by the Contractor and the Owner.

(o) *Claims Distinguished from Changes.*— Claims for damages arising out of alleged negligence of the Engineer or Owner as provided for under Article 37 of the General Conditions are distinguished from claims for allowances for changes as provided for under Article 29. Claims for damages must be filed entirely separately pursuant to Article 37 of the General Conditions and claims for allowances for changes must be filed entirely separately pursuant to Article 29 unless the Contractor and Owner agree in writing otherwise.

(p) *Conditions Different from Those Indicated in Contract Documents.*—The parties contemplate delays necessary to complete tests, to redesign, and to perform change order Work in the event conditions encountered at the site are different from those indicated in the Contract Documents, or to perform change order Work to correct errors and omissions in the Drawings and Specifications. Execution of any change must be authorized. In such event there shall be an adjustment in the Contract Price as provided in the Contract for changes in the Work, but no claim

for damages shall lie against the Owner for the aforesaid delays. Such delays are not a breach of contract because the parties contemplate such delays as a natural and probable consequence of construction operations. The parties agree that such delays constitute no wrong or injury, create no right to a claim for damages, and are not a ground for claiming extraordinary remuneration.

(q) *Unit Prices.*— The term "net" as used in reference to "unit prices" means in respect to Change Orders performed in accordance with Case (b) of Article 29 of the General Conditions that the unit prices offered by the Contractor and accepted by the Owner shall be inclusive of all sums for payment, repayment, reimbursement, remittance, remuneration, compensation, profit, cost, overhead, expense, loss, expenditure, allowance, charge, demand, hire, wages, salary, tax, cash, assessment, price, money, bill, statement, dues, recovery, restitution, benefit, recoupment, exaction, or injury. Upon request of the Owner in writing and within such reasonable space of time as the Owner shall designate in writing, the Contractor shall submit for consideration of the Owner proposals in writing for unit prices to be applied in the event Work is authorized by the Owner to be performed under Case (b) of Article 29. Under penalty of false swearing, a principal of the contracting firm shall certify that the unit prices submitted do not exceed current costs for like services or materials.

(r) *Combining Small Change Orders.*—The Owner may, with the Contractor's concurrence, elect to postpone the issuance of a Change Order until such time that a single Change Order of substantial importance can be issued incorporating several changes. In such cases, the Owner will indicate this intent for each change in the Contract in a written notice to the Contractor, following agreement by the Owner and Contractor on the scope, price and time, if any, of the change.

(s) *Changes in the Contract Time.*—The Contract Time may be changed only by a Change Order. Changes in the Work described in section (a) of this Article and any other claim made by the Contractor for a change in the Contract Time will be evaluated by the Engineer and if the conditions warrant, an appropriate adjustment of the Contract Time will be made. The Engineer, when making these evaluations will take into consideration the amount and scope of Work which has been changed and will evaluate if the change in Work has affected the Critical Path as currently accepted on the Progress Schedule such that it would delay the completion of the Project. If after these evaluations have been made, and in the sole opinion of the Engineer the Contractor is due an extension of the Contract Time, then it will be granted by a Change Order. Extensions of the Contract Time granted as a result of weather will not result in a change in Contract Price.

(t) *Effect of Executed Change Order.*-The execution of a Change Order by the Contractor shall constitute conclusive evidence of the Contractor's agreement to the ordered changes in the Work, the Contract as thus amended, the Contract Price and the Contract Time. The Contractor, by executing the Change Order, waives and forever releases any claim against the Owner for additional time or compensation for matters relating to or arising out of or resulting from the Work included within or affected by the executed Change Order. The foregoing waiver and release expressly includes, without limitation, claims for additional compensation or time based on the theory that the Contractor has suffered so-called "impact" damage attributable to the effect of change order Work

on other change orders Work or on unchanged Work.

Article 30. - Payments and Completion.—(a) *Contract Price.*— The Contract Price is either a lump sum or the sum of the unit prices stated in the Contract Agreement, for each item multiplied by the actual quantities installed of each item, and is the total amount payable by the Owner to the Contractor for the performance of the Work set forth in the Contract Documents. It is understood that the Contractor shall provide and pay for all products, labor, (including labor performed after regular working hours, on Sundays, or on legal holidays), equipment, tools, water, light, power, sewer, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, place into operation, and deliver the Work.

(b) *Application for Payment and Receipts.*—The Contractor shall submit to the Engineer in accordance with a form to be supplied by the Owner an application for each monthly progress payment, and, if requested by the Owner or Engineer, receipts or other vouchers, showing his payments for materials and labor, including payments to Subcontractors as required by Article 10 of the General Conditions.

(c) *Progress Payments.*—If progress payments are made on valuation of Work done, such complete application shall be submitted to the Engineer at least twenty (20) days before payment falls due. In applying for payments, the Contractor shall submit a statement based upon the Schedule of Values on a progress payment form to be supplied by the Owner, and, if requested by the Engineer or Owner, itemized in such form and supported by such evidence as the Engineer or Owner may direct showing the Contractor's right to the payment claimed.

(d) *Materials stored.*—Application for payment may include, at the Contractor's option, the cost of products not yet incorporated into the Work which have been delivered to the site or to other storage locations authorized and approved by the Engineer. The Owner reserves the right to accept or reject pay requests for stored materials, and to limit payments to those stored materials which, in the Engineer's judgment, are necessary for continuing satisfactory Project progress.

Payment for stored products will be subject to the following conditions being met or satisfied:

(1) The products shall be received in a condition satisfactory for incorporation in the Work, including manufacturer's storage and installation instructions;

(2) The products shall be stored in accordance with the manufacturer's recommendations and in such manner that any and all manufacturer's warranties will be maintained and that they will not be damaged due to weather, construction operation, or any other cause;

(3) An invoice from the manufacturer shall be furnished for each item on which payment is requested. The request may include reimbursement for cost of delivery, limited to

common carrier rates, to the site, but will not include the Contractor handling, on or off site, or for storage expense;

(4) The Contractor shall, on request of the Engineer, furnish written proof from the supplier of payment (less retention equal in percentage to that being retained by the Owner) for the products no later than 30 days after receipt of payment for same from the Owner. The Owner will have the right to deduct from the next payment estimate an amount equal to the payment for products if reasonable and adequate proof is not submitted; and,

(5) Shop drawings, product data and samples, showing "No Exceptions Taken", have been received from the Contractor for that specific equipment or material.

(e) *Operating Test Period.*—Upon receipt of written notice from the Contractor that the Work is ready to be placed into service for the operating test period, the Engineer will, within a reasonable time, inspect the Work. Prior to initiating the operating test, Work required by the Contract Documents must be in place and operable as determined by the Engineer, which includes, but is not limited to the following:

(1) Pressure testing all lines as required in the Specifications;

(2) Making adjustments of manhole rims;

(3) Performing functional tests and providing manufacturers' required certification as specified;

(4) Removing temporary plugs, bulkheads, bypasses, etc., and diverting flow into the facility when directed by the Engineer; and,

(5) All painting, grassing and restoration of the Work area, provided the Work area is not part of another segment not yet in the 30-day operating test period.

When the Engineer finds the Work of the Contractor ready for initiation of the operating test period, the Engineer will recommend to the Owner that the operating test period begin.

Certain segments of the Work, whether new or existing to be modified, may need to be placed in service prior to completion of the entire Project. Prior to placing these segments in operation, the requirements above, which pertain to the operating test period, must be complete for each segment.

The operating test period begins upon written notification from the Owner and runs for a period of 30 days. During this period, the Contractor shall complete all remaining items of Work, make adjustments found to be necessary, and ensure that all equipment and systems are functioning properly, and continue to function properly. The beginning of the operating test period initiates the

Owner's responsibility for providing chemicals, power, and operating personnel. The Contractor retains responsibility for maintaining equipment until acceptance by the Owner. The segments to be placed into service prior to completion of the entire Project will be determined solely by the Engineer or the Owner.

(f) *Conditions Precedent to Application for Final Payment.*—ALL WORK REQUIRED BY THE CONTRACT DOCUMENTS MUST BE COMPLETED BEFORE THE FINAL INSPECTION IS PERFORMED. This includes, but is not limited to, the following:

(1) Performing infiltration and pressure tests as described in the detailed Specifications;

(2) Removing temporary plugs, bulkheads, bypasses, etc.;

(3) Flushing all lines with potable water furnished by Contractor;

(4) Pressure testing all lines as required in the Specifications;

(5) Demonstrating the operation of all valves;

(6) Providing specified instruction for the Owner's personnel;

(7) Disinfecting all water mains as required in the Specifications; and,

(8) Grassing and restoration of the Work area.

(g) *Notification of Readiness for Final Inspection.*—When all conditions precedent for the application have been completed, the Contractor shall submit completed Record Drawings to the Engineer and give notice to the Engineer in accordance with Article 5 of the Contract Agreement with a copy to the Owner in the following words:

> The work on the Contract for the _____ having been fully completed except as stipulated hereinbelow, it is requested that a final inspection be made promptly by the Engineer in accordance with Article 5 of the Contract Agreement. The following Work is incomplete through no fault of the Contractor:

No final inspection shall be made until such time as the Engineer has received a letter in the exact form indicated above and a copy thereof has been received by the Owner. In the event the Contractor shall have issued the "Notice of Readiness for Final Inspection" prematurely [hereinafter referred to as "false start"] he shall be liable for the damage resulting from the aforesaid false start including but not limited to the salaries, professional fees, and travel and living expenses of the persons or parties inconvenienced by the aforesaid false start. The Contractor acknowledges and agrees that he has an indivisible, non-delegable, and non-transferable contractual obligation to the Owner to make its own inspections of the Work at all stages of construction; and the Contractor

shall supervise and superintend performance of the Contract in such manner as to enable it to confirm and corroborate at all times that all Work has been executed strictly, literally, rigidly, and inflexibly in accordance with the methods and materials designated in the Contract Documents so that (a) its certifications on periodical estimates shall be true and correct and (b) its notice of readiness for final inspection shall be true and correct. Accordingly, the Contractor agrees that it may not defend or excuse any deviation from the Contract Documents on the ground (a) that the deviation was not brought to its attention by another person or party or other persons or parties or (b) that a Subcontractor is, or Subcontractors are, at fault.

(h) *Final Acceptance.*—If the Engineer finds the Work of the Contractor complete and acceptable in accordance with the provisions of the Contract Documents and that the Record Drawings accurately depict the complete Work, the Engineer will recommend to the Owner that the Project be accepted and that final payment be made. In the event that the final inspection reveals deficiencies in meeting the Contract requirements, the Contractor shall complete all remaining items of Work, and make adjustments found to be necessary. Upon receipt of written notice from the Contractor that the Work is complete and ready for re-inspection, the Engineer will make another final inspection. The Contractor will be notified, in writing, by the Owner of the final acceptance of the Work. The date of final acceptance shall be the beginning of the warranty period.

(i) *Liens.*—Neither the final payment or any part of the retained percentage shall become due until the Contractor has furnished the Owner proper and satisfactory evidence (under oath if required) that all claims for labor employed and materials used in the construction of the Work under this Contract have been paid, satisfied or waived, and that no claims can be filed against the Owner for such labor or materials. If required, the Contractor shall deliver to the Owner a complete release of all liens or claims arising out of this Contract, and an affidavit that so far as it has knowledge or information the releases include all labor and materials for which a lien or claim could be filed; provided, however, that the Contractor may, if any Subcontractor or claimant refuses to furnish a release, furnish a bond satisfactory to the Owner to indemnify the Owner against any lien or claim. If any lien or claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the Owner may be compelled to pay in discharging such lien or claim, including all costs and a reasonable attorneys' fees.

(j) *Compliance with O.C.G.A. §§ 13-10-80 and 13-10-81.*—For purposes of O.C.G.A. § 13-10-80(b) the term "substantial completion of the Work" shall mean that "the Work has been satisfactorily completed and is accepted in accordance with the Contract Documents." If upon completion of the second "final" inspection provided for in subsection (g) of this Article there are still remaining (i) any disputed indebtedness or (ii) if there are liens upon the property, or (iii) there are any items of Work uncompleted which in the opinion of the Engineer are "incomplete items" within the meaning of O.C.G.A. §§ 13-10-80(b)(2)(B) and/or 13-10-81(c), an amount equal to two hundred percent (200%) of each such item of indebtedness, lien or uncompleted Work as determined by the Engineer shall be withheld until such item or items are paid, settled or completed and the remaining retainage shall be paid to the Contractor.

Article 31. - Certificates of Payment.—(a) *Issuance.*—If the Contractor has made application for payment as provided under Article 30, the Engineer shall not later than the date when each payment falls due issue to the Owner a certificate for such amounts as he decides to be properly due or state in writing his reasons for withholding a certificate.

(b) *Warranty of Title.*—The Contractor warrants that title to all Work and products covered by a Certificate of Payment, whether incorporated into the Project or not, will pass to the Owner upon the receipt of such payment by the Contractor, free and clear of all liens, claims, security interests or encumbrances except retention equal in percentage to that being retained by the Owner.

(c) *Effect.*—No Certificate issued, or payment made to the Contractor, or partial or entire use of occupancy of the Project by the Owner shall be an acceptance of any Work or materials not in accordance with the Contract Documents. The making of the final payment shall constitute a waiver of all claims by the Owner other than those arising from unsettled liens, from faulty work appearing after final payment, or from the requirements of the Contract Documents, including but not limited to the provisions of Article 5, Hazards and Indemnification, of these General Conditions. Acceptance of the final payment shall operate as and shall be a release by the Contractor to the Owner from all claims of any kind or character arising out of or related to the Contract except for such specific amount or amounts as may have been withheld to cover the fair value of any incomplete Work which has been certified by the Engineer under the provision of Paragraph (d) of Article 5 of the Contract Agreement as incomplete through no fault on the part of the Contractor.

(d) *Date and Rate of Payment.*—Progress payments will be made by the Owner to the Contractor in accordance with Article 4 of the Contract Agreement. Final payment will be made in accordance with Article 5 of the Contract Agreement. The date and rate of payment are subject to Article 32 of the General Conditions. Sums retained pursuant to this Article are and remain the property of the Owner until such time as the Contractor shall have become entitled to receive payment of such retainage by complying with the full terms of the Contract Documents.

(e) *Delays in Making Payments.*—The date on which any progress payment is due shall be extended for such period of time as may be necessary in the determination of the Engineer for the Contractor to remedy any incorrect or incomplete application for payment.

(f) *Interest.*—Should the Owner fail to pay the sum named in any certificate of the Engineer when due, the Contractor shall receive, in addition to the sum approved in the certificate, simple interest thereon at the legal rate; PROVIDED, however, that the Contractor shall have given the Owner written notice of the date on which payment was properly due, and no interest shall be payable if the Owner makes payment when due or within three days after receipt of the aforesaid notice from the contractor. Such notice shall be in writing, and shall set forth:

(1)— A short and concise statement that interest is due pursuant to this Article;
(2)— The principal amount of the progress or final payment which is allegedly due to the Contractor; and,

(3)— The first day and date upon which the Contractor alleges that interest will begin to accrue, pursuant to this Article.

(g) *Integration with the Prompt Pay Act.*—The provisions of the Contract Documents with respect to time limits for payments, grounds for withholding payment, conditions authorizing payments, and interest on late payments shall supersede all provisions of the Georgia Prompt Pay Act, as originally enacted or as amended, and 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 the terms of these Contract Documents.

Article 32. - Payments Withheld.—The Engineer may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate to such extent as may be necessary to protect the Owner from loss on account of:

(a)—Defective work not remedied;

(b)—Claims filed or reasonable evidence indicating probable filing of claims;

(c)—Failure of the Contractor to make payments properly to Subcontractors or for materials or labor;

(d)—A reasonable doubt that the Project can be completed for the unpaid balance of the Contract Price.

(e)—Damage to another Contractor or to some third party;

(f)—Failure to maintain a rate of progress in accordance with the currently approved construction progress schedule;

(g)—Failure to supply enough skilled workers or proper materials; or,

(h)—Failure to complete all Work within the Contract Time.

When the above grounds are removed, the Engineer shall issue to the Owner a certificate for such withheld amounts as he determines to be properly due, and the Owner shall pay such amounts within ten (10) days. At the option of the Owner adherence to the construction progress schedule shall be a condition precedent to the right of the Contractor to demand payment of a progress payment. No omission on the part of the Owner to exercise the aforesaid option shall be construed to be a waiver of breach of the construction progress schedule or acquiescence therein, and the Owner may exercise its option from time to time as often as may, in its judgment, be expedient.

Article 33. - Notice of Commencement.—See Notice to Proceed, as used throughout these General Conditions.

Article 34. - Correction of Work after Final Payment.—Neither (1) the final certificate, (2) or any decision of the Engineer, (3) nor payment, (4) nor any provision in the Contract shall relieve the Contractor of responsibility for faulty materials, faulty workmanship, or omission of Work required by the Contract Documents, and the Contractor shall remedy any defects or supply any omissions resulting therefrom and pay for any damage to other Work resulting therefrom. The Owner shall give notice of observed defects or omissions with reasonable promptness. The Contractor shall within the time designated in orders of condemnation and without expense to the Owner, correct, remedy, replace, re-execute, supply omitted Work, or remove from the premises all Work condemned by the Engineer. The Contractor shall give prompt notice in writing to the Engineer, with copy to the Owner, upon completion of the supplying of any omitted Work or the correction of any Work condemned by the Engineer. In the absence of said notice, it shall be and is presumed under this Contract that there has been no correction of the condemned Work or supplying of omitted Work. If the Contractor does not remove, make good the deficiency, correct, or remedy faulty Work, or supply any omitted Work within the time designated in orders of condemnation without expense to the Owner, the Owner, after ten (10) days' notice in writing to the Contractor, may remove the Work, correct the Work, remedy the Work or supply omitted Work at the expense of the Contractor. In case of emergency involving health, safety of property, or safety of life the Owner may proceed at once. Correction of defective Work executed under the Contract Documents or supplying of omitted Work, whether or not covered by warranty of a Subcontractor or materialmen, remains the primary, direct responsibility of the Contractor. The foregoing obligation of the Contractor shall remain in effect until the same shall have been extinguished by operation of the statute of limitations.

As additional security for the fulfillment of such obligation, but in no way limiting the same, the Contractor warrants and guarantees (1) that all work executed under the Contract Documents shall be free from defects of materials or workmanship for a period of one year from the notice of final acceptance of the Work by the Owner, and (2) that for not less than one year from such final acceptance, or for such greater time as may have been designated in the Contract Documents, products of manufacturers shall be free from defects of materials and workmanship. Whenever written guaranties or warranties are called for, the Contractor shall furnish the aforesaid for such period of time as may be required. The aforesaid instruments shall be in such form as to permit direct enforcement by the Owner against any Subcontractor, materialmen, or manufacturer whose guaranty or warranty is called for, and the Contractor agrees that:

(a) The Contractor is jointly and severally liable with such Subcontractors, materialmen, or manufacturers;

(b) The said Subcontractors, materialmen, or manufacturers are agents of the Contractor for purposes of performance under this Article, and the Contractor, as principal, ratifies the warranties or guaranties of his aforesaid agents by the filing of the aforesaid instruments with the Owner. The Contractor as principal is liable for the acts or omissions of his agents;

(c) Service of notice on the Contractor that there has been breach of any warranty or guaranty will be sufficient to invoke the terms of the instrument; provided, however, that the Owner shall have furnished the Contractor with a copy of notice served on the Subcontractor, materialmen, or manufacturer; and,

(d) The Contractor will bind his Subcontractor, materialmen, and manufacturers to the terms of this Article.

The calling for or the furnishing of written warranties shall in no way limit the contractual obligation of the Contractor as set forth hereinabove. The remedies stated in this Article are in addition to the remedies otherwise available to the Owner, do not exclude such other remedies, and are without prejudice to any other remedies.

Article 35. - Cash Allowances.—The Contractor shall include in the Contract Price all cash allowances named in the Contract Documents and shall cause the Work thus covered to be done by such contractors or firms and for such sums as the Engineer may direct, the Contract Price being adjusted in conformity therewith. The Contractor declares that the Contract Price includes such sums for overhead and profit on account of cash allowances as he deems proper. No demand for overhead and profit other than those included in the Contract Price shall be allowed. The Contractor shall not be required to employ for any such Work persons against whom he has a reasonable objection.

Article 36. – Contractor's Warranty as to Performance.—The Contractor warrants that it is familiar with the codes applicable to the Work and that it has the skill, knowledge, competence, organization, and plan to execute the Work promptly and efficiently in compliance with the requirements of the Contract Documents. The Contractor having the obligation to keep a competent superintendent engaged on the Work during its progress, to employ only skilled mechanics, and to enforce strict discipline and good order among its employees, the Contractor, itself, is responsible for seeing that the Work is installed in accordance with the Contract Documents. Failure or omission on the part of the Owner, representatives of the Owner, agents of the Owner, resident engineer inspector, clerk-of-the-works, engineers employed by the Engineer, representatives of the Engineer, or the Engineer either to discover or to bring to the attention of the Contractor any deviation from, omission from, or noncompliance with the Contract Documents shall not be asserted by the Contractor as a defense for failure on the Contractor's part to install the Work in accordance with the Contract Documents or for any other neglect to fulfill requirements of the Contract; nor shall the presence of any one, or all, or any of the foregoing at the site or the fact that any one, or all, or any of the foregoing may have examined the Work or any part of it be asserted as a defense by the Contractor against a claim for failure on its part to install the Work in accordance with the Contact Documents or for any neglect to fulfill requirements of the Contract. No requirement of this Contract may be altered or waived except in pursuance of a written order of the Owner and in strict accordance with the provisions in the Contract for changes in the Work.

Article 37. - Claims.—(a) *Extra Cost.*—If the Contractor maintains that any instructions by drawings or otherwise involve extra cost to the Owner under this Contract, the Contractor shall give the Owner and the Engineer written notice thereof within a reasonable time after the receipt of such instructions, and in any event before proceeding to execute any change except in emergency endangering life or property. The allowances to the Contractor shall then be as provided under Article 29 of the General Conditions. No claim for extra cost shall be valid unless so made.

(b) *Protest.*—All references to arbitration are deleted from the Contract Documents. Decisions of the Engineer shall be rendered in all cases as provided for under the General Conditions of the Contract, but no decision of the Engineer shall deprive the Owner or the Contractor of any form of redress which may be available under the laws of the State of Georgia to contracting parties. Any decision of the Engineer shall be final and binding on the Contractor in the absence of written notice of protest from the Contractor received by the Owner by registered mail within twelve (12) days of the date of the decision of the Engineer. The Owner shall have twelve (12) days from the date of receipt of a protest within which to investigate and make a reply. There is no provision under the Contract for execution of work "under protest". A protest must contain (1) the date of the decision of the Engineer to which exception is taken, (2) a statement of the issue or issues, (3) a citation of the provision or provisions of the Contract Documents which govern the issue or issues, (4) a summary of the logical principle or principles on which the protest is based, and (5) a summary of the legal grounds for taking exception. Filing a written notice of protest shall not be grounds for an extension of the Contract Time.

(c) *Shall be Based on the Legal Assertions of the Contractor.*—The Contractor shall assert claims solely on the basis of (a) principles of logic and (b) principles of law to which the Contractor, itself, has prescribed. The Contractor shall not protest a decision or request a conference on the ground merely that a Subcontractor, materialmen, or supplier has protested to the Contractor. Accordingly, the Contractor shall neither file a claim or make a request for a conference with the Owner regarding a claim except as it shall be for the purpose of asserting in the exercise of the Contractor's best judgment such views, requests, and legal propositions as he deems the Contractor is entitled to maintain independently of any right of any Subcontractor, materialmen, or supplier against the Contractor.

(d) *Conference with the Owner.*—

> (1) *Effect of.*—The Owner has no legal obligation to confer orally with the Contractor about the terms of the Contract or its performance and may insist that all transactions and all intercourse shall be in writing. Agreement of the Owner to confer with a Contractor shall not be construed as an offer of the Owner to reconsider or alter the Owner's policies, practices, procedures, or prior position, and no such agreement shall constitute a waiver of any right or defense of the Owner. Such a conference is without prejudice to any rights or defense of the Owner. After the conference there will be nothing to confirm since the Owner does not engage itself to do or not to do a thing by agreeing to confer with the

Contractor. It is expressly agreed that no conference between the Contractor and the Owner shall cure any failure of the Contractor to give any notice nor shall it cure any breach of any time limit or revive any right in the Contract.

(2) *Conditions precedent to.*—A proposal from the Contractor for a conference in respect to (a) a dispute, (b) a controversy, or (c) an interpretation or construction of any provision of the Contract Documents shall contain (a) a statement of the issue or issues, (b) a citation of the provisions of the Contract Documents which govern the issue or issues, (c) a precise summary of the logical principle or principles on which the issue or issues are based, and (d) a summary of the legal grounds which the Contractor takes with respect to the issue or issues.

(3) *Basis for and Terms of.*—All conferences between the Owner and the Contractor shall be pursuant to, under the terms of, and in accordance with this Article of the General Conditions.

Article 38. - Use of Premises.—The Contractor shall confine its equipment, apparatus, the staging and storage of materials, the operations of its forces, and the Work to limits indicated by law, ordinances, permits, or the Contract Documents and shall not unreasonably encumber the premises with materials. The Contractor shall not load or permit any part of the Work to be loaded with weight that will endanger its safety. The Contractor shall enforce the Engineer's instructions regarding signs, advertisements, fires, and smoking.

Article 39. - Specification Arrangement.—The Specifications are separated into numbered and titled divisions for convenience of reference. Neither the Owner nor the Engineer assumes any responsibility for defining the limits of any subcontracts on account of the arrangement of the Specifications. Notwithstanding the appearance of such language in the various divisions of the Specifications as, "The Mechanical Contractor", "The Electrical Contractor", "The Roofing Contractor", etc., the Contractor is responsible to the Owner for the entire Contract and the execution of all of the Work referred to in the Contract Documents.

Article 40. - Valuable Material, Geological Specimens.—If during the execution of the Work the Contractor, any Subcontractor, or any servant, employee, or agent of either should uncover any valuable material or materials such as, but not limited to, treasure, geological specimen or specimens, archival material or materials, or ore, the Contractor acknowledges that title to the foregoing is vested in the Owner. The Contractor shall notify the Owner upon discovery of any of the foregoing, shall guard it, and shall deliver it promptly to the Owner. The Contractor agrees that the Geologic and Water Resources Division of the Georgia Department of Natural Resources may inspect the Work at reasonable times consistent with the convenience of the Contractor.

Article 41. - Definitions.—(a) *Applicable Law.*—This Contract shall be governed by the law of Georgia.

(b) *Article Not Plenary.*—This Article is not entire, plenary, or exhaustive of all terms used in the General Conditions which require definition. There are definitions of other terms under Articles to which the terms are related.

(c) *Balanced Bid.*—Balanced Bid shall mean a Bid in which each of the unit prices and total amount bid for each of the listed items reasonably reflects the value of that item with regard to the entire Project considering the prevailing cost of labor, material and equipment in the relevant market. A Bid is unbalanced when, in the opinion of the Owner, any unit prices or total amounts Bid on any of the listed items do not reasonably reflect such actual values.

(d) *Change Order Form.*—The Change Order Form is the instrument by which adjustments in the Contract Price and Contract Time are effected pursuant to changes made in accordance with Case (a), Case (b) or Case (c) of Article 29 of the General Conditions or in accordance with Subparagraph (i) of Article 29 of the General Conditions. The Change Order Form shall be accompanied by a breakdown in the form prescribed in a specimen, which the Owner will supply to the Contractor. The Engineer shall certify to the amount of the adjustment. The Change Order Form shall be signed by the Contractor and the Owner. The breakdown is only for the purpose of enabling the Engineer and the Owner to make a judgment on the dollar amount of the adjustment in the Contract Price. No condition, term, qualification, limitation, exception, exemption, modification, or proviso shall appear in the breakdown. The breakdown shall be in the exact form and language of the above-mentioned specimen. In the event any condition, term, qualification, limitation, exception, exemption, modification, or proviso shall appear in a breakdown, it shall be invalid.

(e) *Contract; Contract Documents.*—The terms Contract and Contract Documents include the Invitation to Bid, Instructions to Bidders, Contractor's Bid (including all documentation accompanying the Bid and any post-Bid documentation required by the Owner prior to the Notice of Award), the Contract Agreement, Bonds, all Special Conditions, General Conditions, Supplementary Conditions, Specifications (Divisions 01 through 46, inclusive), Drawings, and Addenda, together with written amendments, Change Orders, field orders and the Engineer's written interpretations and clarifications issued in accordance with the General Conditions on or after the date of the Contract Agreement. Shop drawing submittals reviewed in accordance with the General Conditions, geotechnical investigations and soils reports, and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site are not Contract Documents.

(f) *Contract Time.*—Contract Time shall mean the number of consecutive calendar days as provided in the Contract Agreement for substantial completion of the Project, to be computed from and including the date of the Notice to Proceed. All time limits stated in the Contract Documents or shown on the construction progress schedule are of the essence of the Contract.

(g) *Contractor.*—The Contractor shall mean the party identified in the Contract Agreement and its authorized and legal representatives.

(h) *Cross-reference and Citations of Articles and Paragraphs of the General Conditions.*—Cross-references and citations of Articles and paragraphs of the General Conditions are for the convenience of the Contractor, Engineer and the Owner, and are not intended to be plenary or exhaustive nor are they to be considered in interpreting the Contract Documents or any part of the Contract Documents.

(i) *Engineer.*—The Engineer shall mean Carter Engineering Group, LLC (if no Engineer, put Macon Water Authority).

(j) *Furnished by Owner.*—Furnished by Owner shall mean that the Owner shall pre-purchase specific products and have them delivered to a place mutually agreed upon by the supplier, the Owner and the Contractor, at no cost to the Contractor. In connection with an item furnished by the Owner, "Install" shall mean to take delivery of the item, off-load and transport to the job site, store as necessary and install according to the Drawings and Specifications.

(k) *Install, Deliver, Furnish, Supply, Provide.*—Such words mean the work in question shall be put in place by the Contractor ready for occupancy and use, unless expressly provided to the contrary.

(l) *Liquidated Damages.*—Liquidated Damages shall mean the sum stated in the Contract Agreement which the Contractor agrees to pay for each consecutive calendar day beyond the Contract Time required to achieve substantial completion of the Project. Liquidated Damages will end upon written notification from the Owner that the Project is ready for initiation of the Operating Test Period for the total Project.

(m) *Meaning of words and phrases.*—Unless the context or the Contract Documents taken as a whole indicate to the contrary, words used in the Contract Documents that have usual and common meanings shall be given their usual and common meanings and words having technical or trade meanings shall be given their customary meaning in the subject business, trade or profession.

(n) *Notices.*—Unless otherwise provided in the Contract Documents, written notice shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered or sent by certified mail to the last business address known to the party that gives notice.

(o) *Notice to Proceed.*—The Notice to Proceed is a written notice from the Owner pursuant to which the Contractor shall commence physical work on the Project site. A Notice to Proceed is a condition precedent to the execution of any Work on the site by the Contractor.

(p) *Order of Condemnation.*—An Order of Condemnation shall be in writing, shall be dated, shall be signed by the Engineer, shall be addressed to the Contractor with a copy to the Owner, and shall contain three elements as follows:

FIRST ELEMENT: Description of Work

(1) which has been omitted or
(2) which is unexecuted as of the date of the Order of Condemnation, the time for its incorporation into the Work under the construction progress schedule having expired, or
(3) which has not been executed in accordance with the methods and materials designated in the Contract Documents.

SECOND ELEMENT: Citation of the provision or provisions of the Contract Documents which has or have been violated.

THIRD ELEMENT: Fixing of a reasonable time within which the Contractor shall have made good or remedied the deficiency which said time shall not be deemed to be an extension of Contract Time or deemed to be authorization for amendment to the construction progress schedule.

An Order of Condemnation may be issued for failure of the Contractor to supply enough workers or enough materials or proper materials, the Order of Condemnation in such event being based on Article 28 of the General Conditions and upon the definition of Work as set forth under Article 41(u).

(q) *Owner.*—The Owner shall mean THE MACON WATER AUTHORITY or its authorized and legal representatives.

(r) *Products.*—Products shall mean materials or equipment permanently incorporated into the Work.

(s) *Specifications.*—The term "Specifications" shall include all written matter in the bound volume (Divisions 01 through 46, inclusive) or on the drawings and any addenda or modifications thereto.

(t) *Subcontractor.*—The term Subcontractor as employed herein includes only those having a direct contract with the Contractor. It includes one who furnishes labor and materials which are incorporated into the Work but does not include one who merely furnished materials incorporated into the Work by the labor of others.

(u) *Work; Project.*—The terms Work and Project shall mean the entire completed construction required to be furnished under the Contract Documents.

END OF SECTION

SECTION 00800

SUPPLEMENTARY CONDITIONS

GENERAL (Example, if any conditions exist)

The provisions in these Supplementary Conditions shall govern in the event of any conflict between the General Conditions and the provisions herein.

Policy "A". – Compaction Tests and Shop Drawing Submittals

Please contact Mr. Joel Herndon, the Macon Water Authority's (the "Owner's) Chief Inspector, at 478.464.5639 before commencing the construction activity. Compaction tests, where required, shall be performed in accordance with Macon Water Authority's policy. The Contractor and the soil testing laboratory shall contact Mr. Herndon before the testing. The location at which the tests are performed will be decided by our inspection crew. The test report shall be submitted to the Engineering Division before the Owner can accept the Project for operation and maintenance. The Contractor shall submit five (5) copies of the shop drawings (ductile iron pipe, gate valve, valve box, ductile iron fittings, fire hydrant, manholes, manhole frames and covers, gravity sewer pipe, support structures, appurtenances, etc.) before installation. The Contractor will not be permitted to install materials and appurtenances until all the shop drawings are approved. The Contractor shall submit two copies of as-built drawings after the completion of construction but before the Project is accepted for operation and maintenance. The as-built drawings shall include the following for water/sewer portion of the Project: location of water main, valves, fire hydrants, fittings, water services to each lot, location of sewer mains, manholes (including rim and invert elevations), distance and angle between manholes, distance and length of each lateral from manholes, location of water main, gate valves, fire hydrants and fittings, width of easements and any other pertinent information.

Note: See Section 01720 for additional requirements.

Policy "B". – Televising: NOT USED

Policy "C". – As-Builts: Produce and submit "AS-BUILT" survey of the generator, electrical lines to and from transfer switch, and any other underground utilities that were encountered during the installation. As-Builts shall be prepared by a licensed Professional Engineer or Georgia Registered Land Surveyor, as appropriate for the project, and shall be submitted before the project is accepted by the Owner for operation and maintenance and before any project plat is signed.

The As-Built drawings shall be submitted in either the (.dxf) or the (.dwg) version DWG 2010 or later on a USB Flash Drive, along with two (2) sets of plans in the same format as shown on the drive. The As-Built drawings shall be submitted on a (24" x 36") sheet. The vertical and horizontal accuracy of the as-builts shall be within 0.1-foot accuracy.

All relative information such as right-of-way, property corners, state plane monuments, etc. shall be located and tied to Georgia State Plane Coordinates.

Policy "D" – Payment Estimate Form – The Contractor shall generate an EXCEL spreadsheet listing all items in the Proposal and columns for quantities this period, total this period, total quantities to date, and total amount to date for a detail backup for the attached pay estimate summary sheet.

MWA PAY ESTIMATE FORM – See Section 00810

- **Project Milestone & Scheduling-** It is the desire of the Owner to complete this Project within the Contract Time allocated in the Contract Documents.

END OF SECTION

Macon Water Authority

Material Pick-up Acknowledgement

Macon Water Authority
790 Second Street P.O. Box 108
Macon GA 31202
Phone: (478) 464–5600
Fax: (478) 738-3864

Project Name: _____

Project Engineer: _____

Project Manager: _____

Itemized List of the Materials:

Material Description	**Size (if applicable)**	**Length (if applicable)**	**Quantity**
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

I understand and acknowledge by receipt of the Materials listed, that:

These Materials furnished by the Macon Water Authority have been inspected thoroughly by me prior to transport to the project location; and that Materials in transport to the project location become the sole responsibility of my company.

_____
(Print Contractor's Company Name)

By:_____
(**Signature** of Authorized Representative - *person picking up the materials*)

Date: _____

Print Name: _____

By: _____
MWA-Warehouse Manager or MWA-Authorized Representative

Date: _____

END OF SECTION

Macon Water Authority

PAY ESTIMATE

Summary Sheet

Macon Water Authority
790 Second Street P.O. Box 108
Macon GA 31202
Phone: (478) 464–5600
Fax: (478) 738-3864

Project Name: _____

MWA's Project Number: _____

Pay Estimate Number: _____ Partial: _____

Final: _____

Pay Period: _____

Original Contract Amount: $_____

Total Change Orders to Date: _____

Current Contract Amount: $_____

Original contract Work Performed to Date: _____

Change Order Work Performed to Date: _____

Materials Stored on Job Site: _____

Subtotal: _____

Less (5 %) Previous Retainage: _____

Subtotal: _____

Less Previous Payments: _____

Current Invoice Amount: _____

Less (5 %) Current Retainage: _____

Balance Due This Payment: _____

According to the best of my knowledge and belief, all items and amounts shown on the face of this Pay Estimate are correct; that all Work has been performed or materials supplied, or both, in full accordance with the requirements of the Contract Documents, or duly authorized deviations or additions thereto; that the foregoing is a true and correct statement of the Contract Price account up to and including the last day of the period covered by this Pay Estimate; that none of the "Balance Due This Payment" has been received, and that the undersigned and its Subcontractors have complied with all the labor provisions of the Contract Documents.

The Contractor further certifies that on those items of Work not disputed that all payables, materials, bills, and other indebtedness connected with the Work have been paid (less retention equal to that being retained by the Owner) for Work covered by previous payments. Quantities on request for partial payment are estimated only. Final quantities are by a final survey and "as built" drawings by Contractor.

_____ By:_____
(Contractor's Company Name-PRINT) (Signature of Contractor's Authorized Representative)

Date: _____ Title: _____

By: _____ By: _____ By: _____
MWA-Inspector Project Engineer MWA-Project Manager

Date: Date_____ Date: _____

Macon Water Authority

PAY ESTIMATE

Summary Sheet

END OF SECTION

SECTION 01010
Summary of Work

PART 1 GENERAL

1.1 DESCRIPTION

A. The Work to be performed under this Contract shall consist of furnishing all labor, tools, equipment and incidentals and performing all Work required to construct complete in place and ready to operate, approximately 690 LF of 4-inch DR 9 DIPS HDPE Sanitary Sewer Force Main by Horizontal Directional Drilling. The pipe material will be furnished by the Macon Water Authority.

B. All Work described above shall be performed as shown on the Drawings and as specified. All work shall be done by those skilled in the type of work involved. When new work adjoins, connects or abuts existing work, the latter shall be altered as necessary and the work connected in a substantial and approved workmanlike manner. All work shall match as nearly as practical the existing, adjoining, and/or adjacent similar work. All existing work which is to remain, that is moved or disturbed or damaged by the contractor's operations shall be restored properly to original condition or replaced at no cost to the Owner.

C. All traffic control signage and procedures shall be in accordance with GA DOT and Bibb County regulations.

1.2 PROJECT LOCATION

The equipment and materials to be furnished will be installed at the locations shown on the Drawings, maps, and etc. Prior to submission of bids, the bidders are encouraged to visit the work site and acquaint themselves with all the requirements of these specifications and all local conditions that may affect the work.

1.3 QUANTITIES

The Owner reserves the right to alter the quantities of work to be performed or to extend or shorten the improvements at any time when and as found necessary, and the Contractor shall perform the work as altered, increased or decreased. Payment for such increased or decreased quantity will be made in accordance with the Instructions to Bidders. No allowance will be made for any change in anticipated profits nor shall such changes be considered as waiving or invalidating any conditions or provisions of the Contract and Bond.

1.4 PARTIAL OWNER OCCUPANCY

The existing facilities to which these improvements are being made will continue operation during the period of construction.

END OF SECTION

SECTION 01016
OCCUPANCY

PART 1 - GENERAL

1.01 PARTIAL OCCUPANCY BY OWNER

A. Whenever, in the opinion of the Engineer, any section or portion of the Work or any structure is in suitable condition, it may be put into use upon the written order of the Engineer and such usage will not be held in any way as an acceptance of said Work or structure, or any part thereof, or as a waiver of any of the provisions of these Specifications and the Contract. Pending final completion and acceptance of the Work, all necessary repairs and replacements, due to defective materials or workmanship or operations of the Contractor, for any section of the Work so put into use shall be performed by the Contractor at Contractor's own expense.

END OF SECTION

SECTION 01020
ALLOWANCES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section includes allowances for items that may or may not be required on the project due to unforeseen conditions uncovered during the progression of the work. These items will only be utilized as directed by the Engineer.

1.02 SUMMARY

A. The Contractor shall allow the sum of $10,000 for General Engineering Allowances. General Engineering Allowances (GEAs) shall be utilized to incorporate cost changes for any additional authorized work into the scope of work up to the amount budgeted above. Contract change orders shall be enforced for contract changes over and above this amount. These GEAs shall authorize the Contractor to perform additions to work, but the Contractor shall perform no work until written authorization has been delivered to the Contractor by the Owner. Contractor should not expect that any GEAs will be issued; GEAs shall be issued at the discretion of the Authority only.

The value of any work covered by a GEA shall be determined as described in the General Conditions.

PART 2 – PRODUCTS: Not Used.

PART 3 – EXECUTION

3.01 PREPARATION

A. Amounts stated shall include all taxes, coordination and handling that may be required to provide the items/work to the Owner.

END OF SECTION

MEASURMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE

A. The Bid lists each item of the Project for which payment will be made. No payment will be made for any items other than those listed in the Bid.

B. Required items of work and incidentals necessary for the satisfactory completion of the work which are not specifically listed in the Bid, and which are not specified in this Section to be measured or to be included in one of the items listed in the Bid, shall be considered as incidental to the work. All costs thereof, including Contractor's overhead costs and profit, shall be considered as included in the lump sum or unit prices bid for the various Bid items. The Contractor shall prepare the Bid accordingly.

C. Work includes furnishing all labor, equipment, tools and materials, which are not furnished by the Owner and performing all operations required to complete the work satisfactorily, in place, as specified and as indicated on the Drawings.

1.02 DESCRIPTIONS

A. Measurement of an item of work will be by the unit indicated in the Bid.

B. Final payment quantities shall be determined from the record drawings or measured distance. The record lengths, dimensions, quantities, etc. shall be determined from the records and/or drawings after the completion of all required work.

C. Payment will include all necessary and incidental related work not specified to be included in any other item of work listed in the Bid.

D. Unless otherwise stated in individual sections of the Specifications or in the Bid, no separate payment will be made for any item of work, materials, parts, equipment, supplies or related items required to perform and complete the work. The costs for all such items required shall be included in the price bid for item of which it is a part.

E. "Products" shall mean materials or equipment permanently incorporated into the work.

1.03 DEMOLITION (NOT USED)

1.04 SITE WORK

A. No additional payment will be made for site work unless previously approved by the owner.

1.05 CONTINGENCY

A. A $10,000 contingency is added to the bid to be used at the direction of the Owner. Measurement for the use of these monies is for the additional items installed as agreed upon by the contractor and engineer (owner)

B. Payment for items that require the use of contingency monies will be lump sum for the materials and work involved as agreed upon by the contractor and engineer (owner).

END OF SECTION

SECTION 01091
CODES AND STANDARDS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Whenever reference is made to conforming to the standards of any technical society, organization, body, code or standard, it shall be construed to mean the latest standard, code, specification or tentative specification adopted and published at the time of advertisement for Bids. This shall include the furnishing of materials, testing of materials, fabrication and installation practices. In those cases where the Contractor's quality standards establish more stringent quality requirements, the more stringent requirement shall prevail. Such standards are made a part hereof to the extent which is indicated or intended.

B. The inclusion of an organization under one category does not preclude that organizations' standards from applying to another category.

C. In addition, all work shall comply with the applicable requirements of local codes, utilities and other authorities having jurisdiction.

D. All material and equipment, for which a UL Standard, an AGA or NSF approval or an ASME requirement is established, shall be so approved and labeled or stamped. The label or stamp shall be conspicuous and not covered, painted, or otherwise obscured from visual inspection.

E. The standards which apply to this Project are not necessarily restricted to those organizations which are listed in Article 1.02.

1.02 STANDARD ORGANIZATIONS

A. Piping and Valves

ACPA	American Concrete Pipe Association
ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
AWWA	American Water Works Association
CISPI	Cast Iron Soil Pipe Institute
DIPRA	Ductile Iron Pipe Research Association
FCI	Fluid Controls Institute
MSS	Manufacturers Standardization Society
NCPI	National Clay Pipe Institute

NSF	National Sanitation Foundation
PPI	Plastic Pipe Institute
	Uni-Bell PVC Pipe Association

B. Materials

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials

C. Painting and Surface Preparation

NACE	National Association of Corrosion Engineers
SSPC	Steel Structures Painting Council

D. Electrical and Instrumentation

AEIC	Association of Edison Illuminating Companies
AIEE	American Institute of Electrical Engineers
EIA	Electronic Industries Association
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IPC	Institute of Printed Circuits
IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Society of America
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
TIA	Telecommunications Industries Association
UL	Underwriter's Laboratories
VRCI	Variable Resistive Components Institute

E. Aluminum

AA	Aluminum Association
AAMA	American Architectural Manufacturers Association

F. Steel and Concrete

ACI	American Concrete Institute
AISC	American Institute of Steel Construction, Inc.
AISI	American Iron and Steel Institute
CRSI	Concrete Reinforcing Steel Institute
NRMA	National Ready-Mix Association

PCA	Portland Cement Association
PCI	Prestressed Concrete Institute

G. Welding

ASME	American Society of Mechanical Engineers
AWS	American Welding Society

H. Government and Technical Organizations

AIA	American Institute of Architects
APHA	American Public Health Association
APWA	American Public Works Association
ASA	American Standards Association
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASQC	American Society of Quality Control
ASSE	American Society of Sanitary Engineers
CFR	Code of Federal Regulations
CSI	Construction Specifications Institute
EDA	Economic Development Administration
EPA	Environmental Protection Agency
FCC	Federal Communications Commission
FmHA	Farmers Home Administration
FS	Federal Specifications
IAI	International Association of Identification
ISEA	Industrial Safety Equipment Association
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
NBFU	National Board of Fire Underwriters
(NFPA)	National Fluid Power Association
NBS	National Bureau of Standards
NISO	National Information Standards Organization
OSHA	Occupational Safety and Health Administration
SI	Salt Institute
SPI	The Society of the Plastics Industry, Inc.
USDC	United States Department of Commerce
WEF	Water Environment Federation

I. General Building Construction

AHA	American Hardboard Association
AHAM	Association of Home Appliance Manufacturers
AITC	American Institute of Timber Construction
APA	American Parquet Association, Inc.
APA	American Plywood Association

BHMA	Builders Hardware Manufacturers Association
BIFMA	Business and Institutional Furniture Manufacturers Association
DHI	Door and Hardware Institute
FM	Factory Mutual Fire Insurance Company
HPMA	Hardwood Plywood Manufacturers Association
HTI	Hand Tools Institute
IME	Institute of Makers of Explosives
ISANTA	International Staple, Nail and Tool Association
ISDSI	Insulated Steel Door Systems Institute
IWS	Insect Screening Weavers Association
MBMA	Metal Building Manufacturers Association
NAAMM	National Association of Architectural Metal Manufacturers
NAGDM	National Association of Garage Door Manufacturers
NCCLS	National Committee for Clinical Laboratory Standards
NFPA	National Fire Protection Association
NFSA	National Fertilizer Solutions Association
NKCA	National Kitchen Cabinet Association
NWMA	National Woodwork Manufacturers Association
NWWDA	National Wood Window and Door Association
RMA	Rubber Manufacturers Association
SBC	SBCC Standard Building Code
SDI	Steel Door Institute
SIA	Scaffold Industry Association
SMA	Screen Manufacturers Association
SPRI	Single-Ply Roofing Institute
TCA	Tile Council of America
UBC	Uniform Building Code

J. Roadways

AREA	American Railway Engineering Association
DOT	Department of Transportation
SSRBC	Standard Specifications for Construction of Transportation Systems, Georgia Department of Transportation

K. Plumbing

AGA	American Gas Association
NSF	National Sanitation Foundation
PDI	Plumbing Drainage Institute
SPC	SBCC Standard Plumbing Code

L. Refrigeration, Heating, and Air Conditioning

AMCA	Air Movement and Control Association

ARI	American Refrigeration Institute
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
CGA	Compressed Gas Association
CTI	Cooling Tower Institute
HEI	Heat Exchange Institute
IIAR	International Institute of Ammonia Refrigeration
NB	National Board of Boilers and Pressure Vessel Inspectors
PFMA	Power Fan Manufacturers Association
SAE	Society of Automotive Engineers
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SMC	SBCC Standard Mechanical Code
TEMA	Tubular Exchangers Manufacturers Association

M. Equipment

AFBMA	Anti-Friction Bearing Manufacturers Association, Inc.
AGMA	American Gear Manufacturers Association
ALI	Automotive Lift Institute
CEMA	Conveyor Equipment Manufacturers Association
CMAA	Crane Manufacturers Association of America
DEMA	Diesel Engine Manufacturers Association
MMA	Monorail Manufacturers Association
OPEI	Outdoor Power Equipment Institute, Inc.
PTI	Power Tool Institute, Inc.
RIA	Robotic Industries Association
SAMA	Scientific Apparatus Makers Association

1.03 SYMBOLS

Symbols and material legends shall be as scheduled on the Drawings.

END OF SECTION

SECTION 01200
PROJECT MEETINGS

PART 1 - GENERAL

1.01 SCOPE

A. Work under this Section includes all scheduling and administering of pre-construction and progress meetings as herein specified and necessary for the proper and complete performance of this Work.

B. Scheduling and Administration by Engineer of Record on behalf of Macon Water Authority Inspections Department:

1. Prepare agenda.
2. Make physical arrangements for the meetings.
3. Preside at meetings.
4. Record minutes and include significant proceedings and decisions.
5. Distribute copies of the minutes to participants.

1.02 PRECONSTRUCTION CONFERENCE

A. The Engineer of Record shall schedule the preconstruction conference prior to the issuance of the Notice to Proceed.

B. Representatives of the following parties are to be in attendance at the meeting:

1. Owner.
2. Engineer.
3. Contractor and superintendent.
4. Major subcontractors.
5. Representatives of governmental or regulatory agencies when appropriate.

C. The agenda for the preconstruction conference shall consist of the following as a minimum:

1. Distribute and discuss a list of major subcontractors and a tentative construction schedule.
2. Critical work sequencing.
3. Designation of responsible personnel and emergency telephone numbers.
4. Processing of field decisions and change orders.
5. Adequacy of distribution of Contract Documents.
6. Schedule and submittal of shop drawings, product data and samples.
7. Pay request format, submittal cutoff date, paydate and retainage.
8. Procedures for maintaining record documents.

9. Use of premises, including office and storage areas and Owner's requirements.
10. Major equipment deliveries and priorities.
11. Safety and first aid procedures.
12. Security procedures.
13. Housekeeping procedures.
14. Workhours.

1.03 PROJECT COORDINATION MEETINGS

A. Project Coordination Meetings may be requested at any time at the discretion of the Owner, Engineer or Contractor. The party requesting a meeting shall provide the other two parties with as much notice as possible, as well as a written agenda for such meeting.

END OF SECTION

SECTION 01310
CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.01 SCOPE

A. The work under this Section includes preparing, furnishing, distributing, and periodic updating of the construction schedules as specified herein.

B. The purpose of the schedule is to demonstrate that the Contractor can complete the overall Project within the Contract Time and meet all required interim milestones.

1.02 SUBMITTALS

A. Overall Project Schedule (OPS)

1. Submit the schedule within 10 days after date of the Notice to Proceed.
2. The Engineer will review the schedule and return it within 10 days after receipt.
3. If required, resubmit within 10 days after receipt of a returned copy.

B. Near Term Schedule (NTS)

1. Submit the first Near Term Schedule within 10 days of the Notice to Proceed.
2. The Engineer will review the schedule and return it within 10 days after receipt.

C. Submit an update of the OPS and NTS with each progress payment request.

D. Submit the number of copies required by the Contractor, plus four copies to be retained by the Engineer.

1.03 APPROVAL

A. Approval of the Contractor's detailed construction program and revisions thereto shall in no way relieve the Contractor of any of Contractor's duties and obligations under the Contract. Approval is limited to the format of the schedule and does not in any way indicate approval of, or concurrence with, the Contractor's means, methods and ability to carry out the Work.

1.04 OVERALL PROJECT SCHEDULE (OPS)

A. The Contractor shall submit to the Engineer for approval a detailed Overall Project Schedule of the Contractor's proposed operations for the duration of the Project. The OPS shall be in the form of a Gantt/bar chart.

B. Gantt/Bar Chart Schedule

1. Each activity with a duration of five or more days shall be identified by a separate bar. Activities with a duration of more than 20 days shall be sub-divided into separate activities.
2. The schedule shall include activities for shop drawing preparation and review, fabrication, delivery, and installation of major or critical path materials and equipment items.
3. The schedule shall show the proposed start and completion date for each activity. A separate listing of activity start and stop dates and working day requirements shall be provided unless the information is shown in text form on the Gantt/bar chart.
4. The schedule shall identify the Notice to Proceed date, the Contract Completion date, major milestone dates, and a critical path.
5. The schedule shall be printed on a maximum 11 x 17-inch size paper. If the OPS needs to be shown on multiple sheets, a simplified, one page, summary bar chart showing the entire Project shall be provided.
6. The schedule shall have a horizontal time scale based on calendar days and shall identify the Monday of each week.
7. The schedule shall show the precedence relationship for each activity.

1.05 NEAR TERM SCHEDULE (NTS)

A. The Contractor shall develop and refine a detailed Near Term Schedule showing the day to day activities with committed completion dates which must be performed during the upcoming 30 day period. The detailed schedule shall represent the Contractor's best approach to the Work which must be accomplished to maintain progress consistent with the Overall Project Schedule.

B. The Near Term Schedule shall be in the form of Gantt/bar chart and shall include a written narrative description of all activities to be performed and describe corrective action to be taken for items that are behind schedule.

1.06 UPDATING

A. Show all changes occurring since previous submission of the updated schedule.

B. Indicate progress of each activity and show actual completion dates.

C. The Contractor shall be prepared to provide a narrative report at the Project Coordination Meetings. The report shall include the following:

1. A description of the overall Project status and comparison to the OPS.
2. Identify activities which are behind schedule and describe corrective action to be taken.
3. A description of changes or revisions to the Project and their effect on the OPS.
4. A description of the Near Term Schedule of the activities to be completed during the next 30 days. The report shall include a description of all activities requiring participation by the Engineer and/or Owner.

END OF SECTION

SECTION 01320
CONSTRUCTION VIDEO & PHOTOGRAPHS

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall furnish all equipment, labor and materials required to provide the Owner with a video recording of the Project in DVD or digital format.

B. Video shall become the property of the Owner and none of the videos herein shall be published without express permission of the Owner.

1.02 PRE AND POST CONSTRUCTION PHOTOGRAPHS

A. Prior to the beginning of any work, the Contractor shall take project video of the above ground work area to record existing conditions.

B. Following completion of the work, another recording shall be made showing the same areas and features as in the pre-construction videos.

C. All conditions which might later be subject to disagreement shall be shown in sufficient detail to provide a basis for decisions.

D. The pre-construction video shall be submitted to the Engineer within 25 calendar days after the date of receipt by the Contractor of Notice to Proceed. Post-construction video shall be provided prior to final acceptance of the project.

END OF SECTION

SECTION 01340

SHOP DRAWINGS, PRODUCT DATA & SAMPLES

PART 1 - GENERAL

1.01 SCOPE

A. The work under this Section includes submittal to the Engineer of shop drawings, product data and samples required by the various sections of these Specifications.

B. Submittal Contents: The submittal contents required are specified in each section.

C. Definitions: Submittals are categorized as follows:

1. Shop Drawings
   a. Shop drawings shall include technical data, drawings, diagrams, procedure and methodology, performance curves, schedules, templates, patterns, test reports, calculations, instructions, measurements and similar information as applicable to the specific item for which the shop drawing is prepared.
   b. Provide newly-prepared information, on reproducible sheets, with graphic information at accurate scale (except as otherwise indicated) or appropriate number of prints hereof, with name or preparer (firm name) indicated. The Contract Drawings shall not be traced or reproduced by any method for use as or in lieu of detail shop drawings. Show dimensions and note which are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards and special coordination requirements. Do not allow shop drawing copies without appropriate final "Action" markings by the Engineer to be used in connection with the Work.
   c. Drawings shall be presented in a clear and thorough manner. Details shall be identified by reference to sheet and detail, specification section, schedule or room numbers shown on the Contract Drawings.
   d. Minimum assembly drawings sheet size shall be 24 x 36-inches.
   e. Minimum detail sheet size shall be 8-1/2 x 11-inches.
   f. Minimum Scale:
      (1) Assembly Drawings Sheet, Scale: 1-inch = 30 feet.
      (2) Detail Sheet, Scale: 1/4-inch = 1 foot.
2. Product Data
   a. Product data includes standard printed information on materials, products and systems, not specially prepared for this Project, other

than the designation of selections from among available choices printed therein.

b. Collect required data into one submittal for each unit of work or system, and mark each copy to show which choices and options are applicable to the Project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked and special coordination requirements.

3. Samples
   a. Samples include both fabricated and un-fabricated physical examples of materials, products and units of work, both as complete units and as smaller portions of units of work, either for limited visual inspection or, where indicated, for more detailed testing and analysis.
   b. Provide units identical with final condition of proposed materials or products for the work. Include “range” samples, not less than three units, where unavoidable variations must be expected, and describe or identify variations between units of each set. Provide full set of optional samples where the Engineer's selection is required. Prepare samples to match the Engineer's sample where indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations and compliance with standards. Samples are submitted for review and confirmation of color, pattern, texture and “kind” by the Engineer. Engineer will note “test” samples, except as otherwise indicated, for other requirements, which are the exclusive responsibility of the Contractor.
4. Miscellaneous submittals related directly to the Work (non-administrative) include warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, statements of applicability, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, security/protection/safety keys and similar information, devices and materials applicable to the Work but not processed as shop drawings, product data or samples.

1.02 SPECIFIC CATEGORY REQUIREMENTS

A. General: Except as otherwise indicated in the individual work sections, comply with general requirements specified herein for each indicated category of submittal. Submittals shall contain:

1. The date of submittal and the dates of any previous submittals.
2. The Project title.

3. Numerical submittal numbers, starting with 1.0, 2.0, etc. Revisions to be numbered 1.1, 1.2, etc.
4. The Names of:
   a. Contractor
   b. Supplier
   c. Manufacturer
5. Identification of the product, with the Specification section number, permanent equipment tag numbers and applicable Drawing No.
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 Specification numbers.
9. Notification to the Engineer in writing, at time of submissions, of any deviations on the submittals from requirements of the Contract Documents.
10. Identification of revisions on resubmittals.
11. An 8 x 3-inch blank space for Contractor and Engineer stamps.
12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria and coordination of the information within the submittal with requirements of the Work and of Contract Documents.
13. Submittal sheets or drawings showing more than the particular item under consideration shall have all but the pertinent description of the item for which review is requested crossed out.

1.03 ROUTING OF SUBMITTALS

A. Submittals and routine correspondence shall be routed as follows:

1. Supplier to Contractor (through representative if applicable)
2. Contractor to Engineer.
3. Engineer to Owner
4. Owner to Contractor (to be picked up by Contractor)
5. Contractor to Supplier

PART 2 - PRODUCTS

2.01 SHOP DRAWINGS

A. Unless otherwise specifically directed by the Engineer, make all shop drawings accurately to a scale sufficiently large to show all pertinent features of the item and its method of connection to the Work.

B. Submit all shop assembly drawings, larger than 11 x 17-inches, in the form of one reproducible transparency with two opaque prints or bluelines.

C. Submit all shop drawings, 11 x 17-inches and smaller, in the form of six opaque prints or bluelines.

D. One reproducible for all submittals larger than 11 x 17-inches and no more than three prints of other submittals will be returned to the Contractor.

2.02 MANUFACTURER'S LITERATURE

A. Where content of submitted literature from manufacturers includes data not pertinent to this submittal, clearly indicate which portion of the contents is being submitted for the Engineer's review.

B. Submit the number of copies which are required to be returned (not to exceed three) plus three copies which will be retained by the Engineer.

2.03 SAMPLES

A. Samples shall illustrate materials, equipment or workmanship and established standards by which completed work is judged.

B. Unless otherwise specifically directed by the Engineer, all samples shall be of the precise article proposed to be furnished.

C. Submit all samples in the quantity which is required to be returned plus one sample which will be retained by the Engineer.

2.04 COLORS

A. Unless the precise color and pattern is specifically described in the Contract Documents, wherever a choice of color or pattern is available in a specified product, submit accurate color charts and pattern charts to the Engineer for review and selection.

B. Unless all available colors and patterns have identical costs and identical wearing capabilities, and are identically suited to the installation, completely describe the relative costs and capabilities of each.

PART 3 - EXECUTION

3.01 CONTRACTOR'S COORDINATION OF SUBMITTALS

A. Prior to submittal for the Engineer's review, the Contractor shall use all means necessary to fully coordinate all material, including the following procedures:

1. Determine and verify all field dimensions and conditions, catalog numbers and similar data.

2. Coordinate as required with all trades and all public agencies involved.
3. Submit a written statement of review and compliance with the requirements of all applicable technical Specifications as well as the requirements of this Section.
4. Clearly indicate in a letter or memorandum on the manufacturer's or fabricator's letterhead, all deviations from the Contract Documents.

B. Each and every copy of the shop drawings and data shall bear the Contractor's stamp showing that they have been so checked. Shop drawings submitted to the Engineer without the Contractor's stamp will be returned to the Contractor for conformance with this requirement.

C. The Owner may backcharge the Contractor for costs associated with having to review a particular shop drawing, product data or sample more than two times to receive a "No Exceptions Taken" mark.

D. Grouping of Submittals

1. Unless otherwise specifically permitted by the Engineer, make all submittals in groups containing all associated items.
2. No review will be given to partial submittals of shop drawings for items which interconnect and/or are interdependent. It is the Contractor's responsibility to assemble the shop drawings for all such interconnecting and/or interdependent items, check them and then make one submittal to the Engineer along with Contractor's comments as to compliance, non-compliance or features requiring special attention.

E. Schedule of Submittals – Not Used.

3.02 TIMING OF SUBMITTALS

A. Make all submittals far enough in advance of scheduled dates for installation to provide all required time for reviews, for securing necessary approvals, for possible revision and resubmittal, and for placing orders and securing delivery.

B. In scheduling, allow sufficient time for the Engineer's review following the receipt of the submittal.

3.03 REVIEWED SHOP DRAWINGS

A. Engineer Review

1. Allow a minimum of 10 days for the Engineer's initial processing of each submittal requiring review and response, except allow longer periods where processing must be delayed for coordination with subsequent submittals. The Engineer will advise the Contractor promptly when it is

determined that a submittal being processed must be delayed for coordination. Allow a minimum of two weeks for reprocessing each submittal. Advise the Engineer on each submittal as to whether processing time is critical to progress of the Work, and therefore the Work would be expedited if processing time could be foreshortened.

2. Acceptable submittals will be marked "No Exceptions Taken". A minimum of three copies will be retained by the Engineer for Engineer's and the Owner's use and the remaining copies will be returned to the Contractor.
3. Submittals requiring minor corrections before the product is acceptable will be marked "Make Corrections Noted". The Contractor may order, fabricate and ship the items included in the submittals, provided the indicated corrections are made. Drawings must be resubmitted for review and marked "No Exceptions Taken" prior to installation or use of products.
4. Submittals marked "Amend and Resubmit" must be revised to reflect required changes and the initial review procedure repeated.
5. The "Rejected - See Remarks" notation is used to indicate products which are not acceptable. Upon return of a submittal so marked, the Contractor shall repeat the initial review procedure utilizing acceptable products.
6. Only two copies of items marked "Amend and Resubmit" and "Rejected - See Remarks" will be reviewed and marked. One copy will be retained by the Engineer and the other copy with all remaining unmarked copies will be returned to the Contractor for resubmittal.

B. No work or products shall be installed without a drawing or submittal bearing the "No Exceptions Taken" notation. The Contractor shall maintain at the job site a complete set of shop drawings bearing the Engineer's stamp.

C. Substitutions: In the event the Contractor obtains the Engineer's approval for the use of products other than those which are listed first in the Contract Documents, the Contractor shall, at the Contractor's own expense and using methods approved by the Engineer, make any changes to structures, piping and electrical work that may be necessary to accommodate these products.

D. Use of the "No Exceptions Taken" notation on shop drawings or other submittals is general and shall not relieve the Contractor of the responsibility of furnishing products of the proper dimension, size, quality, quantity, materials and all performance characteristics, to efficiently perform the requirements and intent of the Contract Documents. The Engineer's review shall not relieve the Contractor of responsibility for errors of any kind on the shop drawings. Review is intended only to assure conformance with the design concept of the Project and compliance with the information given in the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site. The Contractor is also responsible for information that pertains

solely to the fabrication processes or to the technique of construction and for the coordination of the work of all trades.

3.04 RESUBMISSION REQUIREMENTS

A. Shop Drawings

1. Revise initial drawings as required and resubmit as specified for initial submittal, with the resubmittal number shown.
2. Indicate on drawings all changes which have been made other than those requested by the Engineer.

B. Project Data and Samples: Resubmit new data and samples as specified for initial submittal, with the resubmittal number shown.

END OF SECTION

SECTION 01400
QUALITY CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Quality assurance – control of installation

B. Tolerances

C. References and standards

D. Testing laboratory services

E. Manufacturer's field services

1.02 RELATED SECTIONS

A. Section 01340 – Shop Drawings, Product Data and Samples – Submission of manufacturers' instructions and certificates.

B. Section 02225 – Excavation, Trenching and Backfilling for Utility System.

1.03 QUALITY ASSURANCE – CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instruction conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized

to withstand stresses, vibration, physical distortion, or disfigurement.

1.04 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable work. Do not permit tolerances to accumulate.

B. Comply with manufacturer's tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

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

1.05 REFERENCES AND STANDARDS

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect/Engineer shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.06 TESTING SERVICES

A. Contractor will appoint and employ services of an independent firm approved by the Owner/Engineer to perform testing. Contractor shall pay for testing services required by the specifications.

B. The independent firm will perform tests and other services specified in individual specification sections and as required by the Owner.

C. Testing and source quality control may occur on or off the project site. Perform off-site testing as required by the Owner.

D. Reports will be submitted by the independent firm to the Engineer and Contractor, in quadruplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

E. Cooperate with independent firm; furnish samples of materials, design, mix,

equipment, tools, storage, safe access, and assistance by incidental labor as requested.

1. Notify Architect/Engineer and independent firm 48 hours prior to expected time for operations requiring services.
2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

F. Testing does not relieve Contractor from performing work to contract requirements.

G. Re-testing required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for re-testing will be made by the Contractor.

1.07 MANUFACTURER'S FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

PART 2 – PRODUCTS: Not Used.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Beginning new work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

END OF SECTION

SECTION 01510
TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 SCOPE

A. Temporary facilities required for this work include, but are not necessarily limited to:

1. Temporary utilities such as water and electricity (may be provided by water truck and generators).
2. First aid facilities.
3. Sanitary facilities.
4. Potable water.
5. Temporary enclosures and construction facilities.

1.02 GENERAL

A. First aid facilities, sanitary facilities and potable water shall be available on the Project site on the first day that any activities are conducted on site. The other facilities shall be provided as the schedule of the Project warrants.

B. Maintenance: Use all means necessary to maintain temporary facilities in proper and safe condition throughout progress of the Work. In the event of loss or damage, immediately make all repairs and replacements necessary, at no additional cost to the Owner.

C. Removal: Remove all such temporary facilities and controls as rapidly as progress of the Work will permit.

1.03 TEMPORARY UTILITIES

A. General

1. Provide and pay all costs for all water, electricity and other utilities required for the performance of the Work.
2. Pay all costs for temporary utilities until Project completion.
3. Costs for temporary utilities shall include all power, water and the like necessary for testing equipment as required by the Contract Documents.

B. Temporary Water: Provide all necessary temporary piping, and upon completion of the Work, remove all such temporary piping. The Contractor shall contact the Macon Water Authority and request a backflow preventer and hydrant meter. The Contractor shall install each at any connection to the water

system and pay base bee and cost per use.

C. Temporary Electricity

1. Provide all necessary wiring for the Contractor's use.
2. Furnish, locate and install area distribution boxes such that the individual trades may use their own construction type extension cords to obtain adequate power and artificial lighting at all points where required by inspectors and for safety.

1.04 FIRST AID FACILITIES

A. The Contractor shall provide a suitable first aid station, equipped with all facilities and medical supplies necessary to administer emergency first aid treatment. The Contractor shall have standing arrangements for the removal and hospital treatment of any injured person. All first aid facilities and emergency ambulance service shall be made available by the Contractor to the Owner and the Engineer's personnel.

1.05 SANITARY FACILITIES

A. Prior to starting the Work, the Contractor shall furnish, for use of Contractor's personnel on the job, all necessary toilet facilities which shall be secluded from public observation. These facilities shall be either chemical toilets or shall be connected to the Owner's sanitary sewer system. All facilities, regardless of type, shall be kept in a clean and sanitary condition and shall comply with the requirements and regulations of the area in which the Work is performed. Adequacy of these facilities will be subject to the Engineer's review and maintenance of same must be satisfactory to the Engineer at all times.

1.06 POTABLE WATER

A. The Contractor shall be responsible for furnishing a supply of potable drinking water for employees, subcontractors, inspectors, engineers and the Owner who are associated with the Work.

1.07 ENCLOSURES AND CONSTRUCTION FACILITIES

A. Furnish, install and maintain for the duration of construction, all required scaffolds, tarpaulins, canopies, steps, bridges, platforms and other temporary construction necessary for proper completion of the Work in compliance with all pertinent safety and other regulations.

END OF SECTION

SECTION 01540
JOB SITE SECURITY

PART 1 - GENERAL

1.01 BARRICADES, LIGHTS AND SIGNALS

A. The Contractor shall furnish and erect such barricades, fences, lights and danger signals and shall provide such other precautionary measures for the protection of persons or property and of the Work as necessary. Barricades shall be painted in a color with reflective tape, paint, reflective plastic medallions or lights so that they will be visible at night. From sunset to sunrise, the Contractor shall furnish and maintain at least one light at each barricade and sufficient numbers of barricades shall be erected to keep vehicles from being driven on or into any Work under construction.

B. The Contractor will be held responsible for all damage to the Work due to failure of barricades, signs and lights and whenever evidence is found of such damage, the Contractor shall immediately remove the damaged portion and replace it at Contractor's cost and expense. The Contractor's responsibility for the maintenance of barricades, signs and lights shall not cease until the Project has been accepted by the Owner.

END OF SECTION

SECTION 01569

SAFETY IN WATER / WASTEWATER WORKS

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall be responsible for conducting all Work in a safe manner and shall take reasonable precautions to ensure the safety and protection of workers, property and the general public. The Contractor's responsibility for protection is described in Articles 21 and 22 of the General Conditions.

B. All construction shall be conducted in accordance with the latest applicable requirements for Part 1926 of the Occupational Safety and Health Act, Safety and Health Regulations for Construction, Section 107 of the Contract Work Hours and Safety Standards Act, as well as any other local, state or federal safety codes and regulations.

C. The Contractor shall designate a trained and qualified employee who is to be responsible for ensuring that the Work is performed safely and in conformance with all applicable regulations.

D. The Contractor shall determine the safety hazards involved in prosecuting the Work and the precautions necessary to conduct the Work safely. If the Contractor is unsure as to any special hazards which may be unique to the various processes and facilities at the project site, it shall be Contractor's responsibility to determine such information prior to beginning the Work.

E. The Contractor shall bear all risks associated with performing the Work and shall fully indemnify and hold harmless the Owner and Engineer.

1.02 SPECIAL REQUIREMENTS – Not Used.

END OF SECTION

SECTION 01610
TRANSPORTATION & HANDLING

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall provide transportation of all equipment, materials and products furnished under these Contract Documents to the Work site. In addition, the Contractor shall provide preparation for shipment, loading, unloading, handling and preparation for installation and all other work and incidental items necessary or convenient to the Contractor for the satisfactory prosecution and completion of the Work.

B. All equipment, materials and products damaged during transportation or handling shall be repaired or replaced by the Contractor at no additional cost to the Owner prior to being incorporated into the Work.

1.02 TRANSPORTATION

A. All equipment, materials and products shall be suitably boxed, crated or otherwise protected during transportation.

B. Where equipment, materials or products will be installed using cranes or hoisting equipment, the Contractor shall ensure that the weights of the equipment or material do not exceed the capacity of the cranes or hoisting equipment.

C. Small items and appurtenances such as gauges, valves, switches, instruments and probes which could be damaged during shipment shall be removed from the equipment prior to shipment, packaged and shipped separately. All openings shall be plugged or sealed to prevent the entrance of water or dirt.

1.03 HANDLING

A. All equipment, materials and products shall be carefully handled to prevent damage or excessive deflections during unloading or transportation.

B. Lifting and handling drawings and instructions furnished by the manufacturer or supplier shall be strictly followed. Eyebolts or lifting lugs furnished on the equipment shall be used in handling the equipment. Shafts and operating mechanisms shall not be used as lifting points. Spreader bars or lifting beams shall be used when the distance between lifting points exceeds that permitted by standard industry practice.

C. Under no circumstances shall equipment or products such as pipe, structural steel, castings, reinforcement, lumber, piles, poles, etc., be thrown or rolled off of trucks onto the ground.

D. Slings and chains shall be padded as required to prevent damage to protective coatings and finishes.

END OF SECTION

SECTION 01611
STORAGE & PROTECTION

PART 1 - GENERAL

1.01 SCOPE

A. The work under this Section includes, but is not necessarily limited to, the furnishing of all labor, tools and materials necessary to properly store and protect all materials, equipment, products and the like, as necessary for the proper and complete performance of the Work.

1.02 STORAGE AND PROTECTION

A. Storage

1. Maintain ample way for foot traffic at all times, except as otherwise approved by the Engineer.
2. All property damaged by reason of storing of material or accessing the site shall be properly replaced at no additional cost to the Owner.
3. Packaged materials shall be delivered in original unopened containers and so stored until ready for use.
4. All materials shall meet the requirements of these Specifications at the time that they are used in the Work.
5. Store products in accordance with manufacturer's instructions.

B. Protection

1. Use all means necessary to protect the materials, equipment and products of every section before, during and after installation and to protect the installed work and materials of all other trades.
2. All materials shall be delivered, stored and handled to prevent the inclusion of foreign materials and damage by water, breakage, vandalism or other causes.
3. Substantially constructed weathertight storage sheds, with raised floors, shall be provided and maintained as may be required to adequately protect those materials and products stored on the site which may require protection from damage by the elements.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary for the approval of the Engineer and at no additional cost to the Owner.

D. Equipment and products stored outdoors shall be supported above the ground on suitable wooden blocks or braces arranged to prevent excessive deflection or

bending between supports. Items such as pipe, structural steel and sheet construction products shall be stored with one end elevated to facilitate drainage.

E. Unless otherwise permitted in writing by the Engineer, building products and materials such as cement, grout, plaster, gypsumboard, particleboard, resilient flooring, acoustical tile, paneling, finish lumber, insulation, wiring, etc., shall be stored indoors in a dry location. Building products such as rough lumber, plywood, concrete block and structural tile may be stored outdoors under a properly secured waterproof covering.

F. Tarps and other coverings shall be supported above the stored equipment or materials on wooden strips to provide ventilation under the cover and minimize condensation. Tarps and covers shall be arranged to prevent ponding of water.

1.03 EXTENDED STORAGE

A. In the event that certain items of major equipment such as air compressors, pumps and mechanical aerators have to be stored for an extended period of time, the Contractor shall provide satisfactory long-term storage facilities which are acceptable to the Engineer. The Contractor shall provide all special packaging, protective coverings, protective coatings, power, nitrogen purge, desiccants, lubricants and exercising necessary or recommended by the manufacturer to properly maintain and protect the equipment during the period of extended storage.

1.04 OWNER FURNISHED EQUIPMENT

A. The Contractor shall provide storage and protection for all Owner furnished equipment and materials, including extended storage as specified above.

END OF SECTION

SECTION 01701

CONTRACT CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

A. Administrative provisions for Substantial Completion and for final acceptance.

1.02 RELATED REQUIREMENTS

A. Section 01340 – Shop Drawings, Product Data and Samples

B. Section 01720 – Record Documents

C. Section 01730 – Operation and Maintenance Data

D. Section 01740 – Warranties and Bonds

1.03 SUBSTANTIAL COMPLETION

A. When the Contractor considers the work substantially complete, he shall prepare a punch list of uncompleted items and send to the Engineer for review. At the same time, the Contractor shall request in writing that the Engineer schedules a pre-final inspection.

B. The Engineer will review the punch list submitted by the Contractor and determine if the project is substantially complete.

C. If the Engineer determines that the project is not substantially complete, he will notify the Contractor in writing which items need to be finished before the project can be considered substantially complete. The Contractor shall continue working to complete all punch list items and resubmit a revised punch list when he considers the work is substantially complete.

D. When the Engineer determines that the work is substantially complete, he will schedule a pre-final inspection with the Owner, Contractor and Engineer. A final punch list will be prepared at this time.

E. After all punch list items have been completed, the Contractor shall send a request in writing to the Engineer to schedule a final inspection. When all punch list items are complete, the Engineer will issue a certificate of substantial completion.

1.04 FINAL COMPLETION

A. When the Contractor considers that all of the work is complete, he shall submit the following certificates:

1. All work has been completed and inspected for compliance with the Contract Documents and all deficiencies listed with the certificate of substantial completion have been corrected.
2. All equipment and systems have been tested, adjusted and are fully operational.
3. Owner's personnel have been fully instructed in the operation of all equipment (include sign off for each system).
4. Work is complete and ready for final inspection.

B. Should Engineer's inspection find work incomplete, he will promptly notify Contractor in writing listing observed deficiencies.

C. Contractor shall remedy deficiencies and send a request for another final inspection.

D. When Engineer finds work is complete, he will process final pay request documents.

1.05 REINSPECTION FEES

A. Should status of completion of work require reinspection by Engineer due to failure of work to comply with Contractor's claims on pre-final or final inspection, the Owner will back charge the Contractor for each extra reinspection required of the Engineer. The Contractor shall reimburse the Owner by certified check prior to final payment of retainage.

1.06 CLOSEOUT SUBMITTALS

A. Evidence of Compliance with Requirements of Governing Authorities –

1. Certificate of Occupancy as required by local codes.
2. Certificates of Inspection approvals required for plumbing, mechanical and electrical systems as required by local codes if applicable.
3. Project acceptance and punchlist items as required by Macon Water Authority Inspector.

B. Project Record Documents – Under provisions of Section 01720.

C. Operation and Maintenance Data – Under provisions of Section 01730.

D. Warranties and Bonds – Under provisions of Section 01740.

E. Keys and Keying Schedule.

F. Evidence of Payment and Release of Liens – In accordance with Conditions of the Contract.

G. Consent of Surety to Final Payment – Consent of Surety is to be sent by Surety directly to Carter Engineering Group to the attention of the Project Engineer.

1.07 APPLICATION FOR FINAL PAYMENT

A. Prior to application for final payment, the Contractor shall give the Engineer a list of all additions or deletions not previously approved by change order.

B. The Engineer will review this list and prepare a Final Closeout Change Order for the items that are justified by the terms of the contract or approved by field order.

C. After approval of the Final Closeout Change Order the Contractor may submit his application for final payment.

PART 2 – PRODUCTS: Not Used.

PART 3 – EXECUTION: Not Used.

END OF SECTION

SECTION 01710
CLEANING

PART 1 - GENERAL

1.01 SCOPE

A. This Section covers the general cleaning which the Contractor shall be required to perform both during construction and before final acceptance of the Project unless otherwise shown on the Drawings or specified elsewhere in these Specifications.

1.02 QUALITY ASSURANCE

A. Daily, and more often if necessary, conduct inspections verifying that requirements of cleanliness are being met.

B. In addition to the standards described in this Section, comply with all pertinent requirements of governmental agencies having jurisdiction.

1.03 HAZARDOUS MATERIAL AND WASTE

A. The Contractor shall handle hazardous waste and materials in accordance with applicable local, state, and federal regulations. Waste shall also be disposed of in approved landfills as applicable.

B. The Contractor shall prevent accumulation of wastes which create hazardous conditions.

C. Burning or burying rubbish and waste materials on the site shall not be allowed.

D. Disposal of hazardous wastes or materials into sanitary or storm sewers shall not be allowed.

1.04 DISPOSAL OF SURPLUS MATERIALS

A. Unless otherwise shown on the Drawings, specified or directed, the Contractor shall legally dispose off the site all surplus materials and equipment from demolition and shall provide suitable off-site disposal site.

PART 2 - PRODUCTS

2.01 CLEANING MATERIALS AND EQUIPMENT

A. Provide all required personnel, equipment and materials needed to maintain the specified standard of cleanliness.

2.02 COMPATIBILITY

A. Use only the cleaning materials, methods and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as approved by the Engineer.

PART 3 - EXECUTION

3.01 PROGRESS CLEANING

A. General

1. Do not allow the accumulation of scrap, debris, waste material and other items not required for construction of this Work.
2. At least each week, and more often if necessary, completely remove all scrap, debris and waste material from the job site.
3. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the environment.

B. Site

1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage.
2. Restack materials stored on site weekly.
3. At all times maintain the site in a neat and orderly condition which meets the approval of the Engineer.

3.02 FINAL CLEANING

A. Definitions: Unless otherwise specifically specified, "clean" for the purpose of this Article shall be interpreted as the level of cleanliness generally provided by commercial building maintenance subcontractors using commercial quality building maintenance equipment and materials.

B. General: Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris and waste. Conduct final progress cleaning as described in 3.01 above.

C. Site: Unless otherwise specifically directed by the Engineer, hose down or pressure wash all paved areas on the site and all public sidewalks directly adjacent to the site; rake clean other surfaces of the grounds. Completely remove all resultant debris.

D. Post-Construction Cleanup: All evidence of temporary construction facilities, haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other evidence of construction, as directed by the Engineer.

E. Restoration of Landscape Damage: Any landscape feature damaged by the Contractor shall be restored as nearly as possible to its original condition at the Contractor's expense. The Engineer will decide what method of restoration shall be used.

F. Timing: Schedule final cleaning as approved by the Engineer to enable the Owner to accept the Project.

3.03 CLEANING DURING OWNER'S OCCUPANCY

Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning of the occupied spaces shall be as determined by the Engineer in accordance with the Supplementary Conditions of the Contract Documents.

END OF SECTION

SECTION 01720
RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SCOPE

A. The work under this Section includes, but is not necessarily limited to, the compiling, maintaining, recording and submitting of project record documents as herein specified.

B. Record documents include, but are not limited to:

1. Drawings;
2. Specifications;
3. Change Orders and other modifications to the Contract;
4. Engineer field orders or written instructions, including Requests for Information (RFI) and Clarification Memorandums;
5. Reviewed shop drawings, product data and samples;
6. Test records.

C. The Contractor shall maintain on the Project site throughout the Contract Time an up to date set of Record Drawings.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Storage

1. Store documents and samples in the Contractor's field office, apart from documents used for construction.
2. Provide files and racks for storage of documents.
3. Provide locked cabinet or secure storage space for storage of samples.

B. File documents and samples in accordance with format of these Specifications.

C. Maintenance

1. Maintain documents in a clean, dry, legible condition and in good order.
2. Do not use record documents for construction purposes.
3. Maintain at the site for the Owner one copy of all record documents.

D. Make documents and samples available at all times for inspection by Engineer.

E. Failure to maintain the Record Documents in a satisfactory manner may be cause for withholding of a certificate for payment.

1.03 QUALITY ASSURANCE

A. Unless noted otherwise, Record Drawings shall provide dimensions, distances and coordinates to the nearest 0.1 foot.

B. Unless noted otherwise, Record Drawings shall provide elevations to the nearest 0.01 foot for all pertinent items constructed by the Contractor.

C. The Contractor shall employ a currently registered professional engineer or land surveyor to prepare the Record Drawings from a post-construction, field run survey. The Record Drawings shall provide elevations to the nearest 0.01 foot for all manhole inverts, manhole frames and other pertinent items constructed by the Contractor. The Record Drawings shall provide dimensions, distances, and coordinates to the nearest 0.01 foot and horizontal angles to the nearest 10 seconds.

1.04 RECORDING

A. Label each document "PROJECT RECORD" in neat, large printed letters.

B. Recording

1. Record information concurrently with construction progress.
2. Do not conceal any work until required information is recorded.

1.05 RECORD DRAWINGS

A. See specific requirement specified under Section 00800 – Supplementary Conditions, Policy “C”.

B. Legibly mark drawings to record actual construction, including:

1. All Construction
   a. Changes of dimension and detail.
   b. Changes made by Requests for Information (RFI), field order, clarification memorandums or by change order.
   c. Details not on original Drawings.
2. Site Improvements, Including Underground Utilities
   a. Horizontal and vertical locations of all exposed and underground abandoned utilities and appurtenances, both newly abandoned pipe and those utilities encountered, referenced to permanent surface improvements.
   b. Location of and dimensions of roadways and parking areas, providing dimensions to back of curb when present.
   c. The locations shall be referenced to at least two easily identifiable, permanent landmarks (e.g., power poles, valve markers, etc.) or

benchmarks.

d. The Record Drawings shall include the horizontal angle and distance between manhole covers.

3. Structures
   a. Depths of various elements of foundation in relation to finish first floor datum or top of wall.
   b. Location of internal and buried utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

1.06 SPECIFICATIONS

A. Legibly mark each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
2. Changes made by Requests for Information (RFI), field order, clarification memorandums, or by Change Order.

1.07 SUBMITTAL

A. At contract closeout, deliver Record Documents to the Engineer for the Owner.

B. Accompany submittal with transmittal letter, in duplicate, containing:

1. Date
2. Project title and number
3. Contractor's name and address
4. Title and number of each record document
5. Signature of Contractor or Contractor's authorized representative
6. Name and address of firm preparing record document
7. Stamp by a professional engineer or land surveyor

END OF SECTION

SECTION 01740
WARRANTIES & BONDS

PART 1 - GENERAL

1.01 PROJECT MAINTENANCE AND WARRANTY

A. Maintain and keep in good repair the Work covered by these Drawings and Specifications until acceptance by the Owner.

B. The Contractor shall warrant for a period of one year from the date of Owner's written final acceptance of the Project that the completed Work is free from all defects due to faulty products or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments or other work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect throughout the warranty period.

C. The Contractor shall not be obligated to make replacements which become necessary because of ordinary wear and tear, or as a result of improper operation or maintenance, or as a result of improper work or damage by another Contractor or the Owner, or to perform any work which is normally performed by a maintenance crew during operation.

D. In the event of multiple failures of major consequences prior to the expiration of the one year warranty described above, the affected unit shall be disassembled, inspected and modified or replaced as necessary to prevent further occurrences. All related components which may have been damaged or rendered non-serviceable as a consequence of the failure shall be replaced. A new 12 month warranty against defective or deficient design, workmanship, and materials shall commence on the day that the item is reassembled and placed back into operation. As used herein, “multiple failures” shall be interpreted to mean two or more successive failures of the same kind in the same item or failures of the same kind in two or more items. Major failures may include, but are not limited to, cracked or broken housings, piping, or vessels, excessive deflections, bent or broken shafts, broken or chipped gear teeth, premature bearing failure, excessive wear or excessive leakage around seals. Failures which are directly and clearly traceable to operator abuse, such as operations in conflict with published operating procedures or improper maintenance, such as substitution of unauthorized replacement parts, use of incorrect lubricants or chemicals, flagrant over-or under-lubrication and using maintenance procedures not conforming with published maintenance instructions, shall be exempted from the scope of the one year warranty. Should multiple failures occur in a

given item, all products of the same size and type shall be disassembled, inspected, modified or replaced as necessary and rewarranted for one year.

E. The Contractor shall, at Contractor's own expense, furnish all labor, materials, tools and equipment required and shall make such repairs and removals and shall perform such work or reconstruction as may be made necessary by any structural or functional defect or failure resulting from neglect, faulty workmanship or faulty materials, in any part of the Work performed by the Contractor. Such repair shall also include refilling of trenches, excavations or embankments which show settlement or erosion after backfilling or placement.

F. Except as noted on the Drawings or as specified, all structures such as embankments and fences shall be returned to their original condition prior to the completion of the Contract. Any and all damage to any facility not designated for removal, resulting from the Contractor's operations, shall be promptly repaired by the Contractor at no cost to the Owner.

G. The Contractor shall be responsible for all road and entrance reconstruction and repairs and maintenance of same for a period of one year from the date of final acceptance. In the event the repairs and maintenance are not made immediately and it becomes necessary for the owner of the road to make such repairs, the Contractor shall reimburse the owner of the road for the cost of such repairs.

H. In the event the Contractor fails to proceed to remedy the defects upon notification within 15 days of the date of such notice, the Owner reserves the right to cause the required materials to be procured and the work to be done, as described in the Drawings and Specifications, and to hold the Contractor and the sureties on Contractor's bond liable for the cost and expense thereof.

I. Notice to Contractor for repairs and reconstruction will be made in the form of a registered letter addressed to the Contractor at Contractor's home office.

J. Neither the foregoing paragraphs nor any provision in the Contract Documents, nor any special guarantee time limit implies any limitation of the Contractor's liability within the law of the place of construction.

END OF SECTION

SECTION 02225

Excavation, Trenching and Backfill for Utility Systems

PART 1 - GENERAL

1.01 SCOPE

A. Furnish all labor, materials, equipment and incidentals necessary to perform all excavation, trenching and backfill required to complete the work shown on the Drawings and specified herein. The work shall include, but is not limited to; stripping of topsoil, excavation for structures, vaults, ducts and pipes; all backfilling, embankment and grading; disposal of waste and surplus materials; and all related work such as sheeting, bracing and dewatering.

B. Topsoil excavated under this Section shall be salvaged by the Contractor for use as specified under Section 02920.

C. Obtain materials required for backfill, fill, or embankments in excess of that available on the site from other sources. Include all costs of obtaining off-site materials in the contract price.

1.02 RELATED WORK

A. Section 02530 – Sanitary Sewer Collection System

1.03 REFERENCES

A. American Society for Testing and Materials.

1.04 MEASUREMENT AND PAYMENT

A. There will be no separate measurement or payment for excavation, trenching and backfilling.

1.05 TESTING SERVICES

A. The Contractor shall obtain the service of a certified testing service to perform all compaction tests specified herein. The cost of these services shall be at Contractor's expense and shall be included in the price bid for the project item to which the testing applies.

B. Soil testing shall be performed by an accredited testing laboratory selected by the Contractor and approved by the Owner in accordance with Section 01410. Tests shall be performed in accordance with applicable ASTM or AASHTO standard methods, unless otherwise specified.

C. All materials to be used in the work shall be tested prior to the use to show conformance with the requirements of these specifications. Test reports shall be delivered to the Engineer in duplicate prior to use of any material in the work.

D. Materials being used in the work, which have been tested previously, may be subjected to further tests from time to time and may be rejected if found defective. Rejected materials shall be removed from the project immediately, notwithstanding the results of former tests to which they have been subjected.

E. Soil tests shall be performed on subgrades prior to the placement of fill or backfill materials. Tests shall also be performed immediately after the placement of each layer of fill or backfill materials to show conformance with the field density and optimum moisture requirements of these specifications. Not less than one set of tests shall be performed for every 800 sq. ft. of area for each layer. No additional layers shall be placed until the density of each layer has been approved.

F. If the Engineer determines, based on tests reports and inspections, that subgrades or layers which have been placed are below the specified density, the Contractor shall provide additional compaction and testing at no additional expense to the Owner.

1.05 PROTECTION

A. Sheeting and Bracing

1. Furnish, put in place, and maintain such sheeting and bracing as may be required to support the sides of excavations, to prevent any movement which could in any way diminish the ridge of the excavation below that necessary for proper construction, and to protect adjacent structures from undermining or other damage. If the Engineer is of the opinion that at any points sufficient or proper supports have not been provided, he may order additional supports put in at the expense of the Contractor, and compliance with such order shall not relieve or release the Contractor from his responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed. Where soil cannot be properly compacted to fill a void, lean concrete shall be used as backfill at no additional expense to the Owner. Sheeting and Bracing requirements are further defined in OSHA Standards,

Subpart P, Part 1926 of the Code of Federal Regulations.

2. The Contractor shall construct the sheeting outside the neat lines of the foundation unless indicated otherwise to the extent he deems it desirable for his method of operation. Sheeting shall be plumb and securely braced and tied in position. Sheeting and bracing shall be adequate to withstand all pressures to which the trench will be subjected. Any movement or bulging which may occur shall be corrected by the Contractor at his own expense so as to provide the necessary clearances and dimensions.

3. Where sheeting and bracing is required to support the sides of excavations, the Contractor shall engage a Professional Engineer, registered in the State of Georgia to design the sheeting and bracing. The sheeting and bracing installed shall be in conformity with the design, and certification of this shall be provided by the Professional Engineer.

4. The Contractor shall leave in place to be embedded in the backfill all sheeting and bracing not shown on the Drawings but which the Engineer may direct him in writing to leave in place at any time during the progress of the work for the purpose of preventing injury to structures, utilities, or property, whether public or private. The Engineer may direct that timber used for sheeting and bracing be cut off at any specified elevation. The Contractor will be paid for such sheeting directed by the Engineer to be left in place in accordance with the General Conditions. All timber sheeting to be left in place shall be treated.

5. All sheeting and bracing not left in place shall be carefully removed in such manner as not to disturb utilities, or property. All voids left or caused by withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose, or otherwise as acceptable to Engineer and Owner.

6. The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his part to issue such orders, and his failure to exercise his right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work on the part of the Contractor to leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.

7. No sheeting is to be withdrawn if driven below mid-diameter of any pipe, and under no circumstances shall any sheeting be cut off at a level lower than 1 ft above the top of any pipe. The cost of said sheeting shall be part of the base bid.

B. Dewatering and Drainage

1. The Contractor shall at all times during construction provide and maintain proper equipment and facilities to remove all water entering excavations, and shall keep such excavations dry so as to obtain a satisfactory undisturbed subgrade foundation condition until the fills, structures or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural levels. The Contractor shall engage a Geotechnical Engineer, Registered in the State of Georgia, where required, to design the dewatering system. The Contractor shall submit to the Engineer for review the design of the dewatering systems prior to commencing work.

2. The Contractor shall furnish, install, maintain, operate and remove a temporary dewatering system consisting of trenches, sump pits, deep wells, well points, or other methods as required to lower and control the groundwater level so that the pipes may be installed in the dry. The Contractor shall assume full responsibility for the design and installation of an adequate dewatering system. The Contractor shall, at his own expense, correct all damage resulting from inadequacy of the dewatering system or from flooding of the construction site from other causes.

3. The Contractor shall maintain the water level below the excavated area for the various phases of the work continuously and shall make such provisions as may be necessary to avoid interruptions due to weather, labor strikes, power failures, or other delays. He shall provide and have ready for immediate use at all times diesel or gasoline powered standby pumping units to serve the system in case of failure of the normal pumping units.

4. Piping and boiling, or any form of uncontrolled seepage, in the bottom or sides of the excavation shall be prevented at all times. If for any reason the dewatering system is found to be inadequate to meet the requirements set forth herein, the Contractor shall at his own expense make such additions, changes and/or replacements as

necessary to provide a satisfactory dewatering system.

5. Dewatering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation. Well or sump installations shall be constructed with proper filters to prevent drawing of finer grained soil from the surrounding ground.

6. Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, and pumped from the excavation to maintain a bottom free from standing water.

7. The Contractor shall take all additional precautions to prevent uplift during construction. The Contractor shall maintain the groundwater level below the pipe so flotation is prevented.

8. Drainage water shall be disposed of through a desilting basin which will prevent the discharge of sediment into any surface waters or existing drains, and to prevent flow or seepage back into the excavated area.

9. Flotation shall be prevented by the Contractor by maintaining a positive and continuous operation of the dewatering system. The Contractor shall be fully responsible and liable for all damages which may result from failure of this system.

10. Removal of dewatering equipment shall be required. The material and equipment constituting the system shall be removed by the Contractor.

11. The Contractor shall take all necessary precautions to preclude the accidental discharge of fuel, oil, etc. in order to prevent adverse effects on groundwater quality.

C. Culverts and Ditches

1. Protect drainage culverts from damage. If damaged, restore to satisfactory condition at no cost to the Owner.

2. If it is necessary to remove a culvert, do not replace until the proposed pipeline is installed and trench backfilled and compacted to the subgrade of the culvert. Replace culverts to the line and

grade established by the Owner.

3. Backfill minor drainage ditches so that the upper one foot of material between ditch banks is topsoil, loam, or clay.

4. Compact this material for the full ditch width to a minimum of 95% of maximum density as determined by ASTM D 698.

5. Ditches steeper than 2:1 slope shall be protected and reinforced with a synthetic fiber or grid material, Type III and rip-rap. Contractor has the option to use plain filter fabric on flatter slopes. Correct any ditch erosion occurring as a result of pipeline construction at no cost to the Owner.

D. Water, Gas, Telephone, Power, Cable

1. Protect all other utilities from damage. Notify utility owner prior to start of excavation as directed in the General Conditions and on the Contract Drawing. If, during the work the utility is damaged, notify the utility company and the Owner immediately. Do not attempt to repair or replace damaged utilities unless so directed by the utility company and approved by the Engineer. Payment for restoration of damaged utilities shall be the Contractor's responsibility.

1.06 JOB CONDITIONS

A. Soils

1. The Contractor shall examine the site and undertake his own soil borings prior to submitting his bid, taking into consideration all conditions that may affect his work. The Owner and Engineer will not assume responsibility for variations of subsoil quality or conditions at locations other than places shown and at the time the investigation was made. The Contractor shall accept the site in its existing condition and shall assume the risk of encountering whatever materials as may occur. The Contractor shall make his own determination of the soil structure and site conditions as it may affect the work.

B. Existing Utilities

1. Locate existing underground utilities in the areas of work. If

utilities are to remain in place, provide adequate means of protection during earthwork operations.

2. Should uncharted, or incorrectly charted, piping appear in the excavation, consult the Engineer and the owner of such piping or utility immediately for directions.

3. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

4. Demolish and completely remove from site existing underground utilities indicated on the Drawings to be removed.

C. Protection of Persons and Property

1. Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.

2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

1.07 SUBMITTALS

A. Submit to the Engineer for review in accordance with Section 01340 the proposed methods of construction, including dewatering, excavation, filling, compaction, and backfilling for the various portions of the work. Review shall be for method only. The Contractor shall remain responsible for the adequacy and safety of the methods.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Backfill materials shall be natural or processed mineral soils, blasted and crushed rock, or masonry rubble. Fill materials shall be free of all organic material, trash, snow, ice, frozen soil or other objectionable materials. Clay soils having natural in-place water content in excess of 30 percent are considered unsuitable for stockpiling and/or future use. Fill materials to be used have been classified under categories specified below.

B. Embedment materials listed here include a number of processed materials plus the soil types defined by the USCS Soil Classification Systems in ASTM D2487. These materials are grouped into categories according to their suitability for this application:

1. Class I: Angular 6 to 40 mm (1/4 to 1-1/2 inches), graded stone including a number of fill materials that have regional significance such as coral, slag, cinders, crushed stone, and crushed shells.

2. Class II: Coarse sands and gravels with maximum particle size of 40 mm (1-1/2 inches), including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil types GW, GP, SW and SP are included in this class.

3. Class III: Fine sand and clayey gravels, including fine sands, sand-clay mixtures, and gravel-clay mixtures. Soil types GM, GC, SM and SC are included in this class.

4. Class IV: Silt, silty clays and clays including inorganic clays and silts of medium to high plasticity and liquid limits. Soil types MH, CH and CL are included in this class. These materials are not to be used for initial backfill.

5. Class V: This class includes the organic soils OL, OH and PT as well as soils containing frozen earth, debris, rocks larger than 40 mm (1-1/2 inches) in diameter, and other foreign materials. These materials shall not be used for backfill.

C. Granular Fill for bedding shall be sound, hard, durable crushed stone meeting the gradation requirements shown on the plans for different building materials and types of pipe.

D. Riprap shall be sound, durable rock which is roughly rectangular shape and of suitable quality to ensure permanence in the condition in which it is to be used. Rounded stones, boulders, sandstone or similar soft stone will not be acceptable. Material shall be free from overburden, spoil, shale, and organic material. Each load of riprap shall be reasonably well graded from the smallest to the maximum size specified and shall conform to State of Georgia Department of Transportation Standard Specifications Section 805. Riprap shall consist of a durable field or quarry stone shaped roughly as rectangular blocks. Riprap shall weigh between 50-100 lbs.

each with at least 60 percent weighing over 100 lbs. and no more than 10 percent shall weigh 50 lbs. or Less. One dimension of each exposed riprap shall be not less than 12-in. The joints in the riprap shall be filled with spalls of suitable size to construct a solid, stable slope, free from large voids and defects.

E. Sand shall conform to ASTM Standard C33 for concrete sand.

PART 3 - EXECUTION

3.01 EXCAVATION

A. Contractor shall strip and stockpile all topsoil for subsequent respreading on the site.

B. The Contractor shall proceed with caution in the excavation and preparation of the trench so that the exact location of underground structures in the trench zone may be determined before being damaged. The Contractor shall be held responsible for the repair or replacement of such structures when broken or otherwise damaged because of Contractor's operations.

C. The Contractor shall make explorations and excavations at no additional charge to the Owner to determine the location of existing underground structures.

D. Utilities and other piping shall be laid in open trenches as shown and specified. Trenches shall be excavated to the designated lines and grades, beginning at the outlet end and progressing toward the upper end in each case. Trenches for pipe shall be shaped to the lower 1/3 of the pipe and provide uniform and continuous bearing. Bell holes shall be dug to allow ample room for working fully around each joint.

E. Trenches shall be of minimum width to provide ample working space for making joints and shall be not less than pipe diameter + 18 inches. Sides of trenches shall be closely vertical to top of pipe and shall be sheet piled and braced where soil is unstable four feet above the top of the pipe, trenches may be sloped. The ridge of the trench above this level shall be laid back in accordance with OSHA standards to provide for a safe work area.

F. Trenches shall be excavated on the alignments shown on the Plans, and to the depth and grade necessary to accommodate the pipes at the elevations

shown. Where elevations of the invert or centerline of a pipe are shown at the ends of a pipe, the pipe shall be installed at a continuous grade between the two elevations.

G. Excavation in excess of the depth required for proper shaping shall be corrected by bringing to grade the invert of the ditch with compacted coarse, granular material at no additional expense to the Owner. Bell holes shall be excavated to relieve bell of all load, but small enough to ensure that support is provided throughout the length of the pipe barrel.

H. Excavation in excess of the depths required for manholes and other structures shall be corrected by placing a subfoundation of 1500 psi concrete, at no additional expense to the Owner.

I. If trenches are excavated to widths in excess of those specified, or if the trench walls collapse, the pipe shall be laid in accordance with the next better class of bedding at the expense of the Contractor.

3.02 TRENCHES

A. Trenches shall be maintained in a safe condition to prevent hazardous conditions to persons working in or around the trench.

B. Braced and sheeted trenches and open trenches shall comply with all State and Federal Laws and Regulations, and local ordinances relating to safety, life, health and property.

C. The top portion of the trench may be excavated with sloping or vertical sides to any width which will not cause damage to adjoining structures, roadways, utilities, etc. The bottom of the trenches shall be graded to provide uniform bearing and support each section of the pipe at every point along its entire length, except for the portions of the pipe sections excavated for bell holes and for the sealing of pipe joints. Bell holes and depressions for joints shall be dug after the trench bottom has been graded and in order that the pipe rests upon the trench bottom for its full length and shall be only of such length, depth and width for making the particular type of joints. The bottom of the trench shall be rounded so that at least the bottom one-third of the pipe shall rest on crushed stone bedding for the full length of the barrel as jointing operations will permit. This part of the excavation shall be done manually only a few feet in advance of the pipe laying by workmen skilled in this type of work.

D. The sides of all trenches and excavation for structures shall be held by stay

bracing, or by skeleton or solid sheeting and bracing according to conditions encountered, to protect the excavation, adjoining property and for the safety of personnel. Bracing and shoring may be removed when the level of the backfilling has reached the elevation to protect the pipe work and adjacent property. When sheeting or shoring above this level cannot be safely removed, it may be left in place. Timber left in place shall be cut off at least 2 feet below the surface. No sheeting below the level of the top of the pipe may be removed.

3.03 PILING EXCAVATED MATERIALS

A. All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing roadways.

3.04 LIMIT TO LENGTH OF OPEN TRENCH

A. Pipe trenches shall not be excavated more than 200 feet in advance of pipe laying and all work shall be performed to cause the least possible inconvenience to the public. Adequate temporary bridges or crossings shall be constructed and maintained where required to permit uninterrupted vehicular and pedestrian traffic.

3.05 REMOVAL OF UNSUITABLE MATERIAL

A. Should overdepth excavation be necessary to remove unsuitable material and to replace with satisfactory material, the Contractor will be paid for this work in accordance with Section 01025 for removal and replacement of unsuitable material, based on the following requirements:

1. When the trench is excavated to the plan depth or as required by these Specifications, and soft or other material not suitable for bedding purposes is encountered in the trench, the Contractor shall immediately notify the Engineer and the testing company for inspection and measurement of the unsuitable material to be removed.

2. No overdepth excavation or backfilling of the overdepth excavated trench shall start until proper measurements of the trench have been taken by the Engineer for the determination of the quantity in cubic yards of unsuitable material excavated. Backfill material and backfilling shall conform to the requirements specified in 3.08 below.

3. No payment will be made for any overdepth excavation of soft unstable material due to the failure of the Contractor to provide adequate means to keep the trench dry.

4. No payment will be made for any overdepth excavation of the unsuitable material and replacement not inspected and measured by the Engineer or testing company prior to excavation.

3.06 BEDDING OF SEWER

A. Pipe shall be laid on foundations prepared in accordance with ANSI/AWWA C600 as modified herein, and in accordance with the various classes of bedding required by the trench width and trench depth for the size of pipe to be laid. Bedding shall be included in the lineal foot price bid for pipe line construction.

B. Embedment shall be of the type shown on the plans for the utility system in which it is used.

C. Bell Holes: Bell holes shall be provided in all classes of bedding to relieve pipe bells of all load, but small enough to ensure that support is provided throughout the length of the pipe barrel.

D. Coarse Granular Bedding: Coarse Granular Bedding material shall consist of crushed stone as shown for individual areas on the plans. Bedding material shall be placed on a flat bottom trench and thoroughly compacted by tamping or slicing with a flat blade shovel. Compacted bedding material shall be extended up the sides of the pipe to the heights shown for the various classes of bedding.

E. Over Width Excavation: If trenches are excavated to widths in excess of those specified below, or if trench walls collapse, pipe shall be laid in accordance with the requirements for at least the next better class of bedding at the expense of the Contractor.

F. Borrow Backfill: Borrow backfill will be required if there is not sufficient suitable material available from other parts of the work to backfill the trenches. Borrow backfill from approved borrow pits shall be used. Only those soils in the borrow pits that meet the specified requirements for suitable material shall be used.

3.07 BACKFILLING

A. Backfilling consists of placing suitable materials removed during the excavation into the excavated areas, placing embedment materials and compacting the same to a density equal to or greater than what exists before excavation or as specified herein.

B. Under backfilling information is also included removal of excess materials and debris from the site, leveling all depressions caused by operation of equipment and maintaining the backfilled areas until accepted by the Owner.

C. All backfill material shall be free of stones, concrete and clay lumps larger than 1/3 cubic foot. Roots, stumps and rubbish which will decompose will not be permitted in the backfill. Backfill material shall have its moisture content corrected, as may be necessary before being placed in the trench to bring the moisture content to approximately "optimum" for good compaction. Any rock, stone, concrete, clay lumps larger than 1/3 cubic foot in volume, rubbish and debris shall be removed from the site and disposed of by the Contractor in a lawful manner at no additional cost to the Owner.

D. Backfilling operations in this work are referred to herein as Backfilling at the Pipe Zone, Type "A" and Type "B".

E. Backfilling in the excavated areas below parts of proposed structures, under structures or in present roadways, future roadways or parking areas as shown on the plans shall be referred to hereinafter as Type "A" Backfilling.

F. Where trenches are located outside of structures, present roadways, future roadways or parking areas as shown on the Plans, the backfilling shall be referred to hereinafter as Type "B" Backfilling. Type “B” Backfilling will not be allowed on this project.

G. Backfilling at the Pipe Zone: Throughout the entire construction, backfilling at the pipe zone shall include bedding and shall be as follows: Backfill material shall be placed below, around each side, and over the top of the pipe, in approximately horizontal layers to a height of 12 inches over the top of the pipe. Layers shall be of such thickness to facilitate the required compaction. This backfill shall be well compacted by using mechanical tamping equipment in such manner as not to damage the pipe, pipe joints or shift the pipe alignment. Workmen shall not be permitted to walk over the pipe until at least 12 inches of compacted fill has been placed over the pipe. The Contractor shall not use water to obtain

compaction except for adding water to the backfill material before placing in the trench to bring the moisture content to approximately "optimum" for good compaction.

H. Type "A" Backfilling: Type "A" backfilling consists of placing sand and gravel or other suitable materials excavated from the trench in the trench in 6 inch thick layers from a point 12 inches above the top of the pipe and mechanically tamped or compacted by rolling until the backfill density after compaction is equal to 95 percent of the maximum density obtainable at optimum moisture content as determined by the Standard Proctor Test (ASTM D698). The upper two feet of the trench shall be compacted to 98 percent of the maximum density obtainable at optimum moisture content as determined by the Standard Proctor Test (ASTM D698). In roadways, base material shall be compacted to 100% of the maximum density obtainable at optimum moisture content as determined by the Modified Proctor Test (ASTM D1557). No water shall be used to secure compaction except for adding water to the backfill material before placing in the trench to bring moisture content approximately "optimum" for good compaction. Each 6 inch thick layer shall be mechanically tamped before additional backfill material is placed in the excavated area.

I. Type "B" Backfilling: Not used on this project.

3.08 PROTECTION OF WATER SUPPLY PIPES

A. Horizontal Separation: Sewers and force mains shall be laid at least 10 feet horizontally from any existing or proposed water main. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10 foot separation, such deviation may allow installation of the sewer or force main closer to the water main, provided that the water main is in a separate trench or on a undisturbed earth shelf located on the side of the sewer or force main and at an elevation so the bottom of the water main is at least 18 inches above the top of the sewer or force main.

B. Crossings: Sewers and force mains crossing water mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer or force main. This shall be the case where the water main is either above or below the sewer or force main. The crossing shall be arranged so that the sewer or force main joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer or force main, adequate structural support shall be provided for the sewer or force main to prevent damage to the water main.

C. Special Conditions: When it is impossible to obtain proper horizontal and vertical separation as stipulated above, both the water main and sewer main shall be constructed on ductile iron pipe with ductile iron pipe extending for a distance of 10 feet on each side of the point of crossing on both the water main and sewer, and shall be pressure tested to assure water tightness prior to backfilling.

3.09 UTILITY CONSTRUCTION IN OTHER EXCAVATION

A. Where utilities are required to be constructed in areas also requiring excavation and backfill for other work, coordinate the work so that the parts come together properly, and the construction of the various parts can be done without damage to other parts. Place bedding which will form bearing for pipes, using suitable material and shaping to the lower 1/3 of the pipe to provide uniform and continuous bearing. Compaction of backfill material which will form bearing shall be equal to that specified hereinbefore under Type "A" Backfilling. After the pipe or other utility is placed, backfilling shall proceed as specified hereinbefore following the requirements specified under "Backfilling at the Pipe Zone," "Type 'A' Backfilling."

3.10 TESTING

A. General: The Contractor shall select a qualified independent testing laboratory for the purpose of identifying soils, checking densities, and classifying soils materials during construction. All testing will be paid for by the Contractor. Copies of all test results shall be furnished to the Engineer in duplicate.

B. Moisture-Density Tests: Testing shall be in accordance with ASTM D698 and ASTM 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 to the Engineer.

C. Field Density Tests: Tests shall be made in accordance with ASTM D698 and ASTM D1557. Tests shall be made in accordance with the following minimum schedule or as required by the soils technician or as may be directed by the Engineer:

1. One test for each 2'-3' lift of backfill for each 300 feet of trench or fraction thereof.

D. Submittals

1. The soils technicians will submit formal reports of all compaction tests and retests. The reports are to be furnished to the Owner and the Engineer as soon as possible upon completion of the required tests.

2. This report information is to include but not be limited to the following:

   a. Date of the test and date submitted.
   b. Location of test (Station Number and Depth).
   c. Wet weight, moisture content and dry weight of field sample.
   d. Description of soil.
   e. 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.
   f. Ratio of field dry density to maximum lab dry density expressed as a percentage.
   g. Comments concerning the field density passing or failing the specified compaction.
   h. Comments about recompaction if required.

E. Compaction Results

1. If any compaction test reveals that fill or backfill is not compacted as specified, the Contractor shall scarify and recompact as required to achieve the specified density. Additional compaction tests shall be made to verify proper compaction. These additional tests required due to failure of the original test shall be paid for by the Contractor at no additional cost to the Owner.

2. The soils technician is to advise the Engineer and the Contractor's Superintendent immediately of any compaction tests failing to meet the specified minimum requirements. No additional backfill is to be placed on a lift with any portion failing.

3.11 CONSTRUCTION ALONG HIGHWAYS, STREETS AND ROADWAYS

A. Excavation, Trenching and Backfilling Operations: Excavation, trenching and backfilling along highways, streets and roadways shall be in accordance with the applicable regulations of the State Department of Transportation with reference to construction operations, safety, traffic control, road maintenance and repair.

B. Protection of Traffic: Provide suitable signs, barricades and lights for protection of traffic, in locations where traffic may be endangered by construction operations. All signs removed by reason of construction shall be replaced as soon as condition which necessitated such removal has been cleared. No highway, street or roadway shall be closed without first obtaining permission from the proper authorities.

C. Construction Operations: The Contractor shall construct all work along highways, streets and roadways using the following sequence of construction operations, so as to least interfere with traffic:

1. Stripping: Where the pipe line is laid along road shoulders, sod, topsoil and other material suitable for shoulder restoration shall be stripped and stockpiled for replacement.

2. Trenching, Laying and Backfilling: Excavate trenches, install pipeline and backfill. The trench shall not be opened any further ahead of pipe laying operations than is necessary for proper laying operations. Trenches shall be progressively backfilled and consolidated and excess material removed immediately.

3. Shaping: Immediately after completing backfilling operations, reshape any damage to cut and fill slopes, side ditch lines, and replace top soil, sod and any other materials removed from shoulders.

D. Excavated Material: Excavated material shall not be placed along highways, streets, and roadways in such manner as to obstruct traffic. Roadways and pavement will be maintained free of earth material and debris.

E. Drainage Structures: All side ditches, culverts, cross drains and other drainage structures shall be kept clear of excavated material and be free to drain at all times.

F. Maintaining Highways, Streets, Roadways and Driveways

1. The Contractor shall furnish a road grader which shall be available for use at all times for maintaining highways, streets and roadways in the work area. All such streets, highways and roadways shall be maintained in suitable condition until completion and final acceptance of the work.

2. Repair all driveways that are cut or damaged. Maintain them in suitable condition until completion and final acceptance of the work.

3.12 REMOVING AND RESETTING FENCES

A. Where existing fences must be removed to permit construction, the Contractor shall remove such fences. As construction progresses, reset the fences in their original location and to their original condition. All costs of removing and re-setting fences and such temporary works as may be required shall be included in the prices for the utility line, unless noted otherwise in the Bid Form.

3.13 PROTECTING TREES, SHRUBBERY AND LAWNS

A. Trees and shrubbery along trench lines shall not be disturbed unless absolutely necessary. Trees and shrubbery necessary to be removed shall be properly heeled-in and re-planted. Heeling-in and re-planting shall be done under the direction of an experienced nurseryman.

B. Where utility trenches cross established lawns, sod shall be cut, removed, stacked and maintained in suitable condition until replaced. Topsoil underlying lawn areas shall likewise be removed and kept separate from general excavated materials. Removal and replacement of sod shall be done under the direction of an experienced nurseryman.

3.14 REMOVE AND REPLACE PAVEMENT

A. Pavement and base course which must be removed for constructing sewers, manholes, force mains, water lines, and all other appurtenances in streets shall be replaced as specified on the Drawings.

1. The top 18 inches of subgrade material immediately under the paving base and also road shoulder shall be carefully removed and kept separate from the rest of the excavated material. This material

shall be placed in the top 18 inches of the backfill. Compact all trenches in 6 inch layers to a density not less than 98 percent at ± 3 percent of optimum moisture content as determined by the Modified Proctor Test or Standard Proctor Test as directed by these Specifications. Further compaction shall be accomplished by leaving the backfilled trench open to traffic while maintaining the surface level with crushed stone or gravel. Settlement in trenches shall be refilled with crushed stone or gravel, and such maintenance shall continue until replacement of pavement.

2. Where utility lines are constructed on unpaved streets, roads or easements, the top 18 inches of soil shall be stripped and windrowed separate from the excavation from trenches. After the line has been installed and the backfill completed within 18 inches of the original grade, the salvaged surfacing shall be replaced. This work shall be considered as general clean up along with the removal of surplus excavated materials from the site and the restoring of the surface outside trench limits to its original condition, the cost of which shall be included in the price bid for the utility line.

3.15 WALKS, DRIVES, CONCRETE CURB AND GUTTER

A. Walks and drives removed or damaged during the course of construction shall be replaced with Class "A" Concrete at the same thickness as removed. They will be cut to a neat edge with a masonry saw after backfilling and compacting trench in 6 inch layers to a density not less than 98 percent at ± 3 percent of optimum moisture content as determined by the Standard Proctor Test.

B. Concrete curb and gutter sections removed or damaged during the course of construction shall be replaced in full sections with concrete having a compressive strength of at least 3,000 psi.

3.16 MEASUREMENT AND PAYMENT

A. The work specified in this Section will not be measured for direct payment except those items specifically stated in this Section and for which bid prices are requested in the Bid Proposal.

END OF SECTION

SECTION 02230
Site Clearing

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Furnish all necessary labor, equipment, material and transportation and performing all operations necessary for removal of surface debris, trees, shrubs, and other plant life.

1.02 RELATED WORK

A. Section 02370 – Soil Erosion Control

B. Section 02225 – Excavation, Trenching & Backfill for Utility Systems

1.03 REFERENCED STANDARDS

A. Conform to Bibb County code for disposal of debris. All stumps and debris shall be removed from the site.

B. Coordinate clearing work with the appropriate utility companies.

PART 2 – PRODUCTS - NOT USED

PART 3 – EXECUTION

3.01 PREPARATION

A. Verify that existing plant life designated to remain is tagged or identified.

B. All items shall be removed by the Contractor and disposed of offsite at the Contractor's expense.

3.02 CLEARING & GRUBBING

A. Clear areas required for access to site and execution of Work and as shown on the Drawings. Clearing shall consist of the felling and cutting of trees into sections, and the satisfactory disposal of the trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within the area to be cleared. Trees, stumps, roots, brush, and other vegetation in areas to be cleared shall be removed completely from the site, except such trees and vegetation as may be indicated or directed to be left standing. Trees designated to be left standing within the cleared areas shall be trimmed of dead branches 1-1/2

inch or more in diameter. Limbs and branches to be trimmed shall be neatly cut close to the trunk of the tree or main branches. Cuts more than 1-1/2 inch in diameter thus made shall be painted with approved treewound paint. Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations, by the erection of timber barriers or by such other means as the circumstances require. Such barriers must be placed and be approved by the Contractor before construction observations can proceed. Clearing shall also include the removal and disposal of structures that obtrude, encroach upon, or otherwise obstruct the work.

B. Grubbing shall consist of the removal and disposal of stumps, roots larger than one (1) inch in diameter, and matted roots from the designated grubbing areas. This material, together with logs and other organic or metallic debris not suitable for building of pavement subgrade or building pads, shall be excavated and removed to a depth of not less than 18-inches below the original surface level of the ground in embankment areas and not less than 2-feet below the finished earth surface in excavated areas. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform with the original adjacent surface of the ground.

3.03 PROTECTION

A. All trees on the site will be removed except those marked specifically on the plans to remain during construction. All trees not to be removed will be protected from injury to their roots and to their top to a distance of three (3') feet beyond the drip-line and no grading, trenching, pruning, or storage of materials may go in this area except as provided by a stakeout by a Owner's representative. The Contractor will pay a penalty for any tree removed from the site has been marked specifically to remain. The Contractor also will pay for any tree which dies due to damage during construction. This applies to all trees on the site whether or not they are shown on the plans.

B. The Contractor shall not be held accountable for damages to trees resulting from placement of fill or removal of soils where such action is required by the contract documents. Any tree, the trunk of which is within 10 feet of any footing or trench, shall be exempt from these penalties except that the Contractor shall exercise all reasonable precautions to preserve even these trees. The contractor agrees to pay penalties as established below in the event that he or any of his subcontractors causes the loss or removal of trees designated to be saved under the provisions of the Agreement.

The penalty is as follows:

Tree Diameter at a Point 4 Fee Above Existing Grade	Penalty
6" – 7"	$300.00
7" – 8"	$375.00
8" – 11"	$550.00
12" – 20"	$800.00
21" and larger	$1,000.00

C. Trees to be graded by the Owner's representative as to variety, condition and site importance with the above figures acting as a maximum penalty with the lowest assessment amount to be no less than one-half of the above penalty figures.

D. Protect bench marks, survey control points, and existing structures from damage or displacement.

E. Protect all utilities that remain.

F. Clearing operations shall be conducted so as to prevent damage by falling trees to trees left standing, to existing structures and installations, and to those under construction, and so as to provide for the safety of employees and others.

3.04 REMOVAL

A. Where indicated or directed, trees and stumps shall be removed from areas outside those areas designated for clearing and grubbing. The work shall include the felling of such tress and the removal of their stumps and roots. Trees shall be disposed of as hereinafter specified.

B. Remove debris, rock, and other extracted plant life from site.

C. Remove all old and abandoned fencing and remnants of old structure which previously occupied the site.

3.05 DISPOSAL

A. Disposal of trees, branches, snags, brush, stumps, etc., resulting from the clearing and grubbing shall be the responsibility of the Contractor and shall be disposed of by removal from the site of this work. All costs in connection with disposing of the material will be at the Contractor's expense. The Contractor shall be responsible for compliance with all local and State laws and regulations relative to the disposal of materials. All

liability of any nature resulting from the disposal of the cleared and grubbed material shall become the responsibility of the Contractor. The disposal of all materials cleared and grubbed will be in accordance with the rules and regulations of the State of Georgia. No material will be burned.

END OF SECTION

SECTION 02370
Soil Erosion Control

PART 1 - GENERAL

1.01 SCOPE

A. Erosion control shall be employed during the construction period and shall include all measures required to prevent soil erosion from the site until permanent erosion control measures are installed. Work shall be accomplished through, but not limited to, the use of berms, dikes, sediment barriers, sediment traps, sediment basins, silt fences, temporary grasses, check dams, mulching, construction exits and slope drains.

B. Erosion control measures described herein shall be continued until such time as permanent planting and restoration of natural areas is effectively in control of erosion from project site.

C. Failure to install and maintain temporary erosion control measures throughout the construction period may be cause to halt construction by governing authorities until such measures are correctly installed and operational. Activity covered in this contract is regulated by the State's Erosion and Sediment Control act and NPDES General Permit for Construction Activity.

1.02 RELATED WORK

A. Construction Drawings.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM).

B. Contractor shall comply with applicable codes, rules, ordinances, regulations, and laws of local, municipal, state or federal authorities having jurisdiction over project.

C. Contractor shall comply with the State's Erosion and Sedimentation Control Act (latest amendment) and NPDES General Permit for Construction Activity.

D. "Manual for Erosion and Sediment Control in Georgia" published by the State Soil and Water Conservation Committee of Georgia.

PART 2 - PRODUCTS

2.01 FILTER FABRIC

A. Filter fabric for silt fences shall be pervious synthetic polymer filaments forming a stable network so that fibers retain their relative positions. Filter fabric shall be of the type recommended by its manufacturer for the intended application. The filter fabric shall meet the following requirements:

1.	Minimum Grab Strength	150 lbs (by ASTM D 1682)
2.	Elongation	25%
3.	Retention Efficiency	75%

B. Silt fence shall be constructed in accordance with details shown on Drawings or may be a prefabricated proprietary type subject to approval by Engineer.

C. Filter Fabric to be installed under this contract is noted on the plans.

2.02 HAY BALE BARRIERS

A. Hay bales shall be well compacted straw, standard size, wire bound. Hay bales may be used as an alternate to silt fence as approved by Engineer. Hay bale check dams shall include silt fence installation as indicated on the plans.

2.03 GRASS

A. Grassing on this project will be the responsibility of the General Contractor.

2.04 FERTILIZER AND SOIL AMENDMENTS-As required to establish permanent grassing.

2.05 MULCH

A. Dry straw or hay of good quality, free of weed seed – spread at a rate of 2-1/2 tons per acre.

B. Wood waste, chips, sawdust or bark spread 2 to 3 inches deep (about 6 to 9 tons per acre).

C. Erosion control matting or netting, such as excelsior, jute, textile and plastic matting, and netting applied in accordance with manufacturer’s recommendations.

2.06 CHEMICALS FOR DUST CONTROL – Not Used.

2.07 EROSION CONTROL BLANKETS:

A. 4:1 – 3:1 Slopes: Use straw fiber blankets sewn between two photo-degradable nets. Blankets shall be S150 as manufactured by North American Green, Curlex II as manufactured by American Excelsior Company, or Landlok S2 as manufactured by SI Geosolutions.

B. 2½:1 and Steeper Slopes: Use erosion control fabric intended for permanent installation on slopes. Fabric shall have (2) U.V. stable nets. Top net shall be 5 lb. black and bottom net shall be 3 lb. black. Nets shall be stitched on 1½" centers. Fabric shall be P300P as manufactured by North American Green or pre-approved equal.

A. Waterways and Swales: Use blankets of curled wood or coconut fiber matrix sewn between two heavy-wieght, UV stabilized nets. Blankets shall be C125 as manufactured by North American Green, Curlex III as manufactured by American Excelsior Company, or Landlok C2 as manufactured by SI Geosolutions.

2.08 RIP-RAP STONE

A. All rip-rap stone shall meet Georgia Department of Transportation Specifications.

PART 3 – EXECUTION

3.01 GENERAL

A. All disturbed soil areas except those to support paving shall be graded and protected from erosion by grassing. Storm water conveyance systems shall have sediment barriers installed at all entrances, intersections, change in direction and discharge points.

B. Erosion control shall be directed toward and have the purpose of controlling soil erosion at its potential source. Downstream sediment entrapment measures shall be employed, but only as a backup to primary control at the source.

C. A continuing program of installation and maintenance of sediment control measures shall be employed during the construction period.

D. Erosion Control Schedule

1. Prior to the pre-construction conference, Contractor shall submit to the Engineer his proposed erosion control plan for the project in accordance with requirements of this section. The schedule shall be based on an analysis of the project conditions and shall be in written form. This schedule shall specifically indicate the sequence of trenching and backfilling, construction of permanent erosion control features and the

proposed uses of temporary erosion control features. Schedule shall also include proposed methods to prevent pollution of streams, lakes and rivers and other water resources.

2. Contractor shall outline his proposed methods of controlling erosion and preventing pollution on public and construction access roads, staging areas and waste disposal areas.
3. No work shall be started until the aforementioned plans and schedules have been accepted by Engineer. Contractor will be responsible for accomplishment of work in accordance with accepted plans and schedules. Engineer may approve changes made necessary by unforeseen circumstances that are beyond the control of Contractor.

E. Engineer has the authority to limit the surface area of erodible earth materials exposed by clearing and grubbing, the surface area of erodible earth exposed by excavation and backfill operations and to direct Contractor to provide immediate permanent or temporary erosion and pollution control measures to prevent contamination of adjacent streams or other water courses.

F. Clearing and grubbing operations shall be so scheduled and performed that grading operations and permanent erosion control features can immediately follow thereafter, if the project conditions permit, otherwise temporary erosion control measures will be required between successive construction stages.

G. Engineer will require Contractor to limit the area of excavation, trenching and pipe laying operations in progress commensurate with Contractor's capability and progress in keeping finish grading, mulching, seeding and other permanent and/or temporary measures current with accepted schedule.

3.02 TEMPORARY GRASSING AND MULCHING

A. Where staged construction or other conditions not controlled by Contractor prohibit the completion of work in a continuous manner; Contractor shall apply temporary mulch to an erodible area.

B. Areas to be left exposed for periods longer than 14 days shall have temporary grass seed planted until such times as final grassing is accomplished.

C. Areas to be mulched need not be to finished grade. Mulch may be placed on slopes as steep as 2:1 using a tractor to imbed the mulch into the slope.

D. Spread wood waste uniformly on slopes that are 3:1 and flatter. No anchoring is needed.

E. Commercial matting and netting. Follow manufacturer's specifications included with the material.

3.02 GRASSING

A. Permanent grassing shall match the existing adjacent lawn area.

3.04 SEDIMENT TRAPS

A. Sediment traps shall be installed by the General Contractor as indicated on the plans and repaired if disturbed or destroyed by Utility installed operations.

3.05 SILT FENCES

A. Temporary silt fences installed by others shall be installed by the General Contractor as indicated on the plans.

3.06 GRADING OPERATIONS

A. Grading operations shall be scheduled so that ground surface will be disturbed for the shortest possible time before permanent construction is installed. Large areas shall be maintained as flat as possible to minimize soil transport through surface flow.

B. Wherever steeper slopes or abrupt changes in grade are required, a diversion or berm shall be constructed at the top of slope to cause surface water to flow along the diversion to a control point to be transported down slope in a slope drain. In no case shall surface water be allowed to flow uncontrolled down slopes.

3.07 CONSTRUCTION IN STREAM BEDS

A. Unless otherwise approved in writing by Engineer, construction operations in rivers, streams and impoundments shall be restricted to those areas that must be entered for the construction of temporary or permanent structures. As soon as conditions permit, rivers, streams and impoundments shall be promptly cleared of all false-work, sheeting or piling which are to be removed, debris and other obstructions. Frequent fording of live streams with construction equipment will not be permitted; therefore, temporary bridges or other structures shall be used whenever an appreciable number of stream crossings are necessary. Unless otherwise approved in writing by Engineer, mechanized equipment shall not be operated in live streams except as may be required to construct channel changes and temporary or permanent structures, and to remove temporary structures.

3.08 RUN-OFF EROSION AND SEDIMENTATION CONTROLS

A. During construction, route run-off through sedimentation barriers and check dams as practical.

B. Contractor shall maintain sedimentation devices in functional condition. Sedimentation barriers and check dams shall be cleaned out when these devices are at least 60 percent of their capacity. Defective materials in barriers and check dams shall be replaced.

C. Contractor shall establish sedimentation barriers at the toe of slopes under construction. These barriers may be relocated and reused after permanent slope stabilization becomes established. As they are relocated, any defective materials shall be replaced. In addition, all debris and silt at previous location will be removed.

D. A crushed stone construction exit pad as detailed on the plans shall be located at all access points to site from public streets in accordance with details shown on drawings. All construction vehicles leaving construction site shall have mud cleaned from their tires at these points to protect public streets from the transportation of sediment from site.

3.09 DUST CONTROL

A. Dust raised from vehicular traffic will be controlled by wetting down the site with water. There shall be no separate payment to the Contractor for dust control measures. Any costs connected thereto shall be a subsidiary responsibility of the Contractor.

3.10 CLEANUP AND REMOVAL

A. At the time, that permanent erosion control is effective, temporary devices and their accumulated sediments shall be removed.

END OF SECTION

SECTION 02530
Sanitary Sewer Collection System

PART 1 GENERAL

1.01 SCOPE

A. This section of the Specifications describes products to be incorporated into the sanitary sewer to within 5' of the new buildings, or as shown on the plans, and requirements for the installation and use of these items. The contractor shall furnish all products and perform all labor necessary to fulfill the requirements of these Specifications. It includes but is not limited to the construction of the following items.

1. Sewer Pipes
2. Manholes
3. Connection to Existing System
4. All necessary appurtenances to collect the wastewater and deliver it to the existing system.

1.02 RELATED WORK

A. Other work required for the construction of the sanitary sewer collection system is specified in the following specifications:

Section No.	Title
02225	Excavation, Trenching and Backfilling for Utilities
02230	Site Clearing
02370	Soil Erosion Control
02920	Grassing
09746	AGRU Sure Grip Concrete Protective Liner

1.03 MEASUREMENT AND PAYMENT

A. Measurement:

1. Sewer: Measurement of the sanitary sewer installation will be on a per foot basis per the various sizes and types shown on the plans.

B. Payment:

1. Sewer: Payment for installing sanitary sewer will be on a lump sum basis for complete installation of the sanitary sewer system.

1.04 REFERENCES

A. ASTM D 3740-94a – Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

B. ASTM E 329-93b – Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

C. ANSI/AWWA C 150/A-21.50-96 – Thickness Design of Ductile Iron Pipe.

D. ANSI/AWWA C 151/A-21.51-91 – Ductile Iron Pipe, Centrifugally Cast, for Water or Other Liquids.

E. ASTM A 746-95 – Ductile Iron Gravity Sewer Pipe.

F. ASTM D 139-93a – Electric-Fusion (Arc) Welded Steel Pipe (NPS 4 and over).

G. ASTM C 478-94 – Precast Reinforced Concrete Manhole Sections.

H. ACI 318-89 – Building code Requirements for Reinforced Concrete.

I. ASTM C 39-94 – Compressive Strength of Cylindrical Concrete Specimens.

J. ASTM C 890-91 – Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.

K. ASTM C 891-90 – Installation of Underground Precast Concrete Utility Structures.

L. ASTM C 913-89 – Precast Concrete Water and Wastewater Structures.

M. ASTM A 615/A 615 M-95b – Deformed and Plain Billet – Steel Bars for Concrete Reinforcement.

N. AASHTO T 191-91 – Density of Soil in-Place by the Sand-Cone Method.

O. ASTM D 2922-91 – Test Methods for Density of Soil and Soil Aggregate in Place By Nuclear Methods (Shallow Depths).

P. ASTM D 1557-91 – Laboratory Compaction Characteristics of Soil Using Modified Effort.

Q. ASTM D 1556-90 – Density and Unit Weight of Soil in Place by the Sand Cone Method.

R. ANSI/AWWA C 111/A 21.11-95 – Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings.

S. ASTM A 377-95 – Index and Specifications for Ductile Iron pressure Pipe and Fittings.

T. ANSI/AWWA C 600-93 – Installation of Ductile Iron Water Mains and their appurtenances.

U. ASTM C890-73 (Latest Revision) – Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete for Water and Wastewater Structures.

V. ASTM C891-78 (Latest Revision) – Standard Practice for Installation of Underground Precast concrete Utility Structures.

W. ASTM C913-79 (Latest Revision) – Precast Concrete Water and Wastewater Structures.

X. *2004 Edition of the Recommended Standards for Wastewater Facilities, Great Lakes – Upper Mississippi River Board of State Public Health and Environmental Manages, Section 38.31.*

Y. ASTM F794 (Latest Revision) – Standard Specification for PVC Gravity Sewer Pipe and Fittings Based on a Controlled Inside Diameter.

1.05 OPTIONS

A. The specifications describe several materials. Where manufacturer's and models of equipment are named in the specification, it is intended that these are to describe the quality and function required. The Contractor may use equipment or materials of other manufacturers provided they are reviewed and accepted by the Engineer and the Owner as meeting the specifications prior to the bid date.

B. The Contractor will furnish the Engineer and the Owner a description of all materials before ordering. The Engineer and Owner will review the Contractor's submittals and provide in writing an acceptance or rejection of material. However, an acceptance of any material by the Engineer does not relieve the Contractor of his responsibility to meet the requirements of the construction plans or these specifications.

1.06 QUALITY ASSURANCE

A. Material and equipment shall be the standard product of a manufacturer who has manufactured them for a minimum of 2 years and who provides published data on the quality and performance of the project.

B. A Subcontractor for any part of the work must have experience on similar work and if required, furnish the Engineer with a list of projects and the Owners or Engineers who are familiar with his competence.

C. Devices, equipment, structures, and systems not designated by the Engineer that the Contractor wishes to furnish shall be designed either by a registered professional engineer or by someone the Engineer approved as qualified. If required, complete design calculations and assumptions shall be furnished to the Engineer or the Owner before acceptance.

D. All testing of the piping shall be made by the Contractor with equipment qualified by the Owner, Engineer, or utility company and in the presence of the Engineer, Owner and utility company. The Engineer or his representative reserves the right to accept or reject testing equipment.

E. Soil testing shall be done by a testing laboratory regularly engaged in soil testing, and shall be approved by the Engineer prior to engagement. Mill certificates of test on materials made by manufacturers will be accepted provided the manufacturer maintains an adequate testing laboratory, makes regularly scheduled tests that are spot checked by an outside laboratory, and furnishes satisfactory certificates with the name of the one making the test.

1.07 PRODUCT DELIVERY, STORAGE & HANDLING

A. Shall be as described in Section 01611 –Protection and Storage.

1.08 ALTERNATIVES

A. The intention of these specifications is to produce the best system for the Owner. If the Contractor suggests that alternate material, equipment or procedures will improve the results at no additional costs, the Engineer and the Owner will examine the suggestion and if it is accepted, it may be used. The basis upon which acceptance of an alternate will be given is its value to the Owner, and not for the convenience of the Contractor.

1.09 GUARANTEE

A. The contractor shall guarantee the quality of the materials, equipment, and workmanship for 12 months after acceptance of the completed Project. Defects discovered during that period shall be repaired by the Contractor, at no cost to the Owner. The Performance bond shall reflect this guarantee.

B. The manufacturers of equipment, valves, pumps, controls, measuring devices and special equipment shall test the equipment at field conditions for compliance with the specifications. The manufacturer shall guarantee his product to be free from defects in material and factory workmanship for a period of 1 year from date of

acceptance of the completed project, provided the product is properly installed, serviced and operated under normal conditions according to the manufacturer's instructions. The manufacturer shall furnish the Engineer with a certificate that the equipment meets the specifications and will perform as required. The manufacturer shall furnish four field trips to the project by a service representative during the first year after completion of the Project at no cost to the Owner.

1.10 EXISTING UTILTIES

A. All known utility facilities are shown schematically on plans, and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown on plans will not relieve the contractor of his responsibility under this requirement. "Existing Utilities Facilities" means any utility that exists on the projects in its original, relocated or newly installed position. The Contractor will be held responsible for the cost of repairs to damaged underground facilities: even when such facilities are not shown on the plans. The Contractor shall contact all utility companies prior to beginning work and request an accurate field location of their respective utility lines. Call Before You Dig (800) 282-7411 Utilities Protection Center 72 Hours Prior to Digging.

B. Damage to any part of the existing utility system facilities by the Contractor or Subcontractors, that is repaired by the user's and Owner's forces, shall be charged to the Contractor on the basis of time and material, plus 30% for overhead and administration.

1.11 JOB CONDITIONS

A. The installation of the wastewater collection system must be coordinated with other work on the site. Generally, the wastewater pipes will be installed first and shall be backfilled and protected so that subsequent excavating and backfilling of other utilities does not disturb them. The Contractor shall replace or repair any of the damaged pipe or structure.

1.12 SEQUENCING AND SCHEDULING – NOT USED

1.13 ACCEPTANCE OF PORTIONS OF WORK

A. The Owner reserves the right to accept and use any portion of the work whenever it is considered in the public interest to do so.

1.14 RECORD DATA

A. It will be required of the Contractor to keep accurate, legible records of the location of any deviations from the construction drawings, any additional items or structures to the construction drawings. These records will be made available to

the Engineer before his inspection for incorporation into the Engineer's Record Drawings.

PART 2 PRODUCTS

Products and materials used in the work shall conform to the following:

2.01 SANITARY SEWER PIPE

A. Ductile Iron Pipe – Shall conform to ANSI A21.50 (AWWA C-150) latest revision, ANSI A21.51 (AWWA C-151) latest revision, and ASTM A746. All pipe, except specials, shall be furnished in nominal lengths of 18 to 20 feet. All ductile iron pipes and fittings shall be bituminous coated on the outside, and cement lined on the inside. Sizes shall be as shown on the drawings. All pipe shall be a minimum of Pressure Class 350.

1. Coating on the outside shall be an asphaltic coating approximately 1 mil thick. The finished coating shall be continuous, smooth, neither brittle when cold or sticky when exposed to the sun, and shall be strongly adherent to the iron.

B. Polyvinyl Chloride Pipe- Shall be installed in accordance with the requirements of ASTM D 2321.

1. PVC Gravity sewer pipe shall be manufactured in accordance with ASTM D 1784, AWWA C905, DR 21 for 36 inches in diameter.

2.02 PIPE JOINTS (GRAVITY SEWER)

A. Ductile Iron Pipe (D.I.) – Shall be flexible rubber gasket Type II, or mechanical joint Type III, with retainer glands, conforming to ASA Specification A21.11.

B. Polyvinyl Chloride Gravity Sewer-Shall be flexible rubber bell and spigot type joints with elastomeric gasket.

C. Transition Joints – The transition between sewer pipes of different materials shall be Ford mechanical joint couplings, or MWA approved equal.

2.03 FORCE MAIN – Not Used.

2.04 MANHOLES

A. Precast Concrete Manholes – shall be Precast reinforced concrete manholes that meet the requirements of ASTM C478 and the details contained in the project drawings. The minimum compressive strength of the concrete in Precast sections shall be 4000 psi.

1. Joints – shall be tongue and groove sealed with flexible gaskets or mastic sealant. Gaskets shall be O-Ring or Type A or B "Tylox" equivalent to ASTM C443; mastic shall be "Ram-nek" with primer. The "Ram-nek" primer shall be applied to all contact surfaces of the manhole joint at the factory in accordance with the manufacturer's instructions.

2. Manhole Boots – Provide Neoprene boot seal where sewer enters the manhole. Holes for pipes entering and leaving the manholes shall be core-drilled at the plant location or in the field.

B. Brick and Mortar – Brick shall be whole and hard burned, conforming to ASTM C 32 Grade MS. Mortar shall be made of one part Portland cement and two parts clean sharp sand. Cement shall be Type I and shall conform to ASTM C 150. Sand shall meet ASTM C 144.

C. Frames and Covers – Cast iron manhole frames and covers shall meet the requirements of ASTM A 48 for Class 35 B gray iron and all applicable local standards. All castings shall be tough, close grained, smooth and free from blow holes, blisters, shrinkage, strains, cracks, cold shots and other imperfections. No casting will be accepted which weighs less than 95 percent of the design weight. Shop drawings must indicate the design weight and provide sufficient dimensions to permit checking. All castings shall be thoroughly cleaned in the shop and given two coats of approved bituminous paint before rusting begins.

1. Manhole frames and covers shall be as shown on the Standard Detail Drawings.

2. All frames and covers shall have machined horizontal bearing surfaces.

3. All manholes shall have standard frames and covers except where specifically shown otherwise on the Drawings.

D. Manhole Steps – no steps in MWA Standard Manholes.

E. Pipe Connections – Shall have flexible watertight joints at the point of entry of any sewer main into the manhole. The joint shall be wedged rubber shape equivalent to "Press Wedge II," or a rubber sleeve equivalent to "Kor-N-Seal" or "Lock-Joint."

2.05 TEES-NOT USED

2.06 LATERALS-NOT USED

2.07 STONE BACKFILL

A. Shall be graded crushed granite #57or #78 stone as required on the plans.

2.08 SAND BACKFILL

A. Shall be clean sand free of clay and organic material. Not more than 10% shall pass the No. 100 sieve.

2.09 BORROW – See Section 02300-Earthwork.

2.10 METAL DETECTION

A. Detection tape shall be composed of a solid aluminum foil encased in a protective plastic jacket. Tapes shall be color coded in accordance with APWA color codes with the following legends: Sanitary Sewerage Systems, Safety Green, "Caution: Sewer Line Buried Below". Colors may be solid or striped. Tape shall be permanently printed with no surface printing allowed. Tape width shall be minimum 2-inches when buried less than 10-inches below the surface. Tape width shall be minimum 3-inches when buried greater than 10-inches and less than 20-inches. Detection tape shall be equal to Lineguard Type III Detectable or Allen Systems Detectatape.

2.11 AIR RELEASE VALVES – NOT USED

2.12 CONCRETE PIERS – Construct concrete piers as shown on the Drawings and in accordance with the following requirements.

A. Material – Concrete shall have a compressive strength of not less than 3000 psi, with not less than 5.5 bags of cement per cubic yard and a slump between 3 and 5 inches. For job mixed concrete, submit the concrete mix design for approval by the Engineer. Ready-mixed concrete shall be mixed and transported in accordance with ASTM C94. Reinforcing steel shall conform to the requirement of ASTM A615, grade 40.

B. Bearing – Earth or Rock

i. Earth – Where excavation reveals undisturbed earth subsurface, construct piers with spread footing foundations as shown on the drawings.

ii. Rock – Where excavation reveals level or benched rock having a minimum safe bearing value of 20,000 psf, construct piers with foundations bearing directly on rock. Drill a minimum of four holes into the rock under each pier and grout dowels into place to anchor the pier to the rock. Hole and dowel sizes shall be as shown on the drawings.

PART 3 EXECUTION

3.01 ON-SITE OBSERVATION

A. The Engineer shall have the right to require that any portion of the work be done in his presence and if any work is covered up after such instruction, it shall be exposed by the Contractor for observation. However, if the Contractor notifies the Engineer that such work is scheduled and the Engineer fails to appear within 48 hours, the Contractor may proceed without him. All work done and materials furnished shall be subject to review by the Engineer or Project Representative. All improper work shall be reconstructed and all materials which do not conform to the requirements of the specifications shall be removed from the work upon notice being received from the Engineer for the rejection of such materials. The Engineer shall have the right to mark rejected materials so as to distinguish them as such.

3.02 HANDLING MATERIALS

A. Unloading: Furnish equipment and facilities for unloading, handling, distributing and storing pipe, fittings, valves and accessories. Make equipment available at all times for use in unloading. Do not drop or dump materials. All materials dropped or dumped will be subject to rejection without additional justification.

B. Handling: Handle pipe, fittings, valves and accessories carefully to prevent shock or damage. Handle pipe by rolling on skids, forklift, or front loader. Do not use material damaged in handling.

C. Distribution: Distribute and place pipe and materials to not interfere with traffic. Do not string pipe more than 300 feet beyond the area where pipe is being laid. Do not obstruct drainage ditches.

D. Storage: Store all pipe which cannot be distributed along the route. Make arrangements for the use of suitable storage areas. Do not interfere with other contractors right to access.

3.03 CONSTRUCTION ALONG HIGHWAYS, STREETS AND ROADWAYS

Install pipelines and accessories along highway, streets and roadways in accordance with the applicable regulations of the County, City and/or the Department of Transportation with reference to construction operations, safety, traffic control, road maintenance and repair.

A. Protection of Traffic: Provide and maintain suitable signs, barricades and lights for protection of traffic.

Replace all highway signs removed for construction as soon as possible. Do not close or block any highway, street, or roadway without first obtaining permission from the proper authorities.

Provide flagmen to direct and expedite the flow of traffic.

B. Construction Operations: Perform all work along highways, streets and roadways to least interfere with traffic.

1. Stripping: Where the pipe line is laid along road shoulders, strip and stockpile all sod, topsoil and other material suitable for shoulder restoration.

2. Trenching, Laying and Backfilling: Do not open the trench any further ahead of pipe laying operations than is necessary. Backfill and remove excess material immediately behind laying operations. Complete excavation and backfill for any portion of the trench in the same day.

3. Shaping: Reshape damaged slopes, side ditches, and ditch lines immediately after completing backfilling operations. Replace topsoil, sod and any other materials removed from shoulders.

C. Excavated Materials: Do not place excavated material along highways, streets and roadways in a manner which obstructs traffic. Sweep all scattered excavated materials off of the pavements.

D. Drainage Structures: Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material and free to drain at all times.

E. Maintaining Highways, Streets, Roadways and Driveways: Maintain streets, highways, and roadways in suitable condition for movement of traffic until completion and final acceptance of the work. Use steel running plate to maintain traffic until pavement is completed.

3.04 EXISTING UNDERGROUND UTILITIES AND OBSTRUCTIONS

A. It is the responsibility of the Contractor to locate all existing utilities along the path of his construction. The drawings shall indicate underground utilities or obstructions that are known to exist. Where these or unforeseen underground utilities are encountered, the location and alignment of the watermain may be changed, upon written approval of the Engineer and Owner, to avoid interference.

3.05 CONNECTIONS TO EXISTING PIPE LINES

A. Before laying pipe, the Contractor shall locate the points of connection to existing pipe lines and uncover as necessary for the Engineer and Owner to confirm the nature of the connections to be made. The Contractor shall furnish materials and make the connection to all existing pipelines. The Contractor will be observed during construction of tie-ins by the Owner and the Engineer. The Contractor shall use all available practices and resources to minimize the time the customers are without service. The Contractor shall notify affected customers of a service outage at least 72 hours in advance by newspapers, letters to customers and door hangers in affected area.

3.06 PIPE DISTRIBUTION

A. Pipe shall be distributed and placed in such a manner that will not interfere with traffic.

B. No pipe shall be strung further along the route than 300 feet beyond the area in which the Contractor is actually working without written permission from the Owner and/or Engineer. The Owner and/or Engineer reserves the right to reduce this distance to a maximum distance of 200 feet in residential and commercial areas based on the effects of the distribution to the adjacent property owners.

C. No street or roadway may be closed for unloading of pipe without first obtaining permission from the proper authorities. The Contractor shall furnish and maintain proper warning signs and obstruction lights for the protection of traffic along highways, streets and roadways upon which pipe is distributed.

D. No distributed pipe shall be placed inside drainage ditches.

E. Distributed pipe shall be placed as far as possible from the roadway pavement, but no closer than five feet from the roadway pavement, as measured edge-to-edge.

F. Contractor shall not excavate sanitary sewer trenches more than 400 feet in advance of pipe laying.

3.07 LOCATION AND GRADE

A. The Drawings show the alignment and grade of the gravity sewer and the position of manholes and other appurtenances. The slope shown on the gravity sewer profile and/or called for in the Specifications is the slope of the invert of the pipe.

B. After the Contractor locates and marks the manhole centerlines or baselines of the gravity sewer, the Contractor shall perform clearing and grubbing.

3.08 LAYING AND JOINTING PIPE AND ACCESSORIES

A. Lay all pipe and fittings to accurately conform to the lines and grades established by the construction drawings.

B. Pipe Installation:

1. Proper implements, tools and facilities shall be provided for the safe performance of the Work. All pipe, fittings and valves shall be lowered carefully into the trench by means of slings, ropes or other suitable tools or equipment in such a manner as to prevent damage to sewer materials and protective coatings and linings. Under no circumstances shall sewer materials be dropped or dumped into the trench.

2. All pipe, fittings, valves and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the Owner and/or Engineer, who may prescribe corrective repairs or reject the materials.

3. All lumps, blisters and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and free from dirt, sand, grit or any foreign materials before the pipe is laid. No pipe which contains dirt shall be laid.

4. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing or other materials shall be placed in the pipe at any time.

5. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

6. It is common practice to lay pipe with the bells facing the direction in which work is progressing.

7. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade shall not be permitted.

C. Alignment and Gradient:

1. Lay pipe straight in alignment and gradient or follow true curves, where shown on the Drawings, as nearly as practicable. Do not deflect any joint more than the maximum deflection recommended by the manufacturer.

2. Maintain a transit, level and accessories on the job to lay out angles and ensure that deflection allowance are not exceeded.

3. The Contractor shall check the invert elevation at each manhole and the gravity sewer invert elevation at least three times daily, start, mid-day and end of day. Elevations shall be checked more frequently if more than 100 feet of pipe is installed in a day or if the gravity sewer is being constructed at minimum slope.

4. The Contractor shall check the horizontal alignment of the gravity sewer at the same schedule as for invert elevations.

5. Should any installed pipe have its alignment, grade, or joints disturbed after placement, it shall be taken up and relaid.

D. Expediting of Work: Excavate, lay the pipe, and backfill as closely together as possible. Do not leave unjointed pipe in the trench overnight. Backfill and compact the trench as soon as possible after laying and jointing is completed. Cover the exposed end of the installed pipe each day at the close of work and at all other times when work is not in progress. If necessary to backfill over the end of an uncompleted pipe or accessory, close the end with a suitable plug, either push-on, mechanical joint, restrained joint or as approved by the Owner and/or Engineer.

E. Joint Assembly:

1. Push-on, mechanical, flange and restrained type joints shall be assembled in accordance with the manufacturer's recommendations.

2. Each restrained joint shall be inspected by the Contractor to insure that it has been "homed" 100%.

F. Cutting Pipe:

1. Cut ductile iron pipe using an abrasive wheel saw.

2. Cut PVC pipe using a suitable saw.

3. Remove all burrs and smooth the end before jointing.

4. The Contractor shall cut the pipe and bevel the end, as necessary, to provide the correct length of pipe necessary for installing the fittings, valves, accessories and closure pieces in the correct location. Only push-on or mechanical joint pipe shall be cut.

G. Fitting Installation:

1. Fittings, plugs and caps shall be set and joined to the pipe in the manner specified in this Section for cleaning, laying and joining pipe.

3.09 SEPARATION BETWEEN WATER & SANITARY SEWER

A. Parallel separation shall be 10 feet horizontal between sanitary sewers and any existing or proposed water mains. Deviation may be authorized for closer installation provided that the sewer is laid in a separate trench such that the bottom of the water main is at least 18 inches above the top of the sewer. Sanitary sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches of vertical clearance, both water and sewer line. Where there is less than 18 inches of vertical clearance, both water and sewer lines shall be ductile iron for one full length each side of the crossing with the water pipe joints located as far as possible from the sewer crossing.

3.10 EXCAVATING, TRENCHING AND BACKFILLING

Refer to Section 02225

3.11 CONNECTION TO AN EXISTING MANHOLE

A. Connection to an existing manhole shall be made by mechanically coring into the wall structure of the manhole. Cored opening shall be sized to properly accommodate a rubber boot seal as specified in this section.

3.12 CONNECTION AND REPAIRS TO AN EXISTING SEWER MAIN

A. Where connections or repairs are required, Contractor shall only use solid sleeves and provide all materials and labor necessary to make the connection or repair to the existing pipeline, excluding service lines 6” or smaller.

3.13 MANHOLE AND PRECAST CONCRETE PRODUCT CONSTRUCTION

A. Construct manholes as shown on the Standard Detail Drawings.

B. Precast Concrete: Handle sections carefully to prevent cracking or chipping. Provide uniform bedding of the bottom section to prevent uneven loading. Install gaskets and joint sealants in accordance with manufacturer’s recommendations to produce a water tight structure.

C. Brick: Bed the bottom and sides of every brick in mortar. Apply a smooth coat of mortar, ¾-inch thick, on the inside and outside.

D. Inverts: Form channels as shown on the Drawings, rounded, and troweled smooth. Maintain consistent grade through the invert. Use sand-cement grout.

E. Top Elevations: Build manholes outside of paved areas to 18-inches above finished grade unless otherwise shown on the Drawings or directed by the Owner and/or Engineer. Build manholes in paved areas to existing grades.

F. Drop Connections: Manholes requiring drop connections are shown on the Drawings. Construct drop connections of the same materials as the upstream sewer and in accordance with the details shown on the Drawings.

G. Frames and Covers: Frames and Covers shall be securely mortared to the cone section.

H. Seal all manhole joints and lift holes, both inside and out, with grout. Between Precast sections, this is in addition to joint sealant.

I. Invert Elevations: The invert elevations shown on the Drawings shall be for the invert at the centerline of the Precast concrete manhole. Prior to setting the laser or other vertical alignment control system for the sewer upstream of the manhole, the Contractor shall verify the elevation of the sewer installed at the manhole.

J. Manholes shall be constructed such that their walls are plumb.

K. Floor doors shall be integrally cast into the top slab, and shall be cast into the concrete in accordance with the manufacturer's recommendations.

L. Interior surfaces of the new manholes shall be lined with a Agru Sure Grip HDPE liner (See Specification Section 09746).

3.14 CONCRETE COLLARS

A. Construct collars as shown on the Drawings.

3.15 DETECTION TAPE

A. Detection tape shall be provided over all sewers constructed by the open cut method.

3.16 THRUST RESTRAINT – Not Used

3.17 INSPECTION AND TESTING

A. Clean and flush lines prior to testing. Clean and test lines before requesting final acceptance. Where any obstruction is met, clean the sewers by means of rods, swabs or other instruments. When requested by the Owner and/or Engineer, flush out lines and manholes before final inspection.

B. Gravity Sewers: Pipe lines shall be straight and show a uniform grade between manholes. Correct any discrepancies discovered during inspection. Televising of the sewer lines is required by the Macon Water Authority prior to final acceptance after other tests are completed. See Supplementary Conditions Section B for Policy.

1. Infiltration Tests: Not Included.

2. Exfiltration Tests:

a. Low-Pressure Air Test:

1. Prior to air testing, the section of sewer between manholes shall be thoroughly cleaned and wetted. Immediately after cleaning or while the pipe is water soaked, the sewer shall be tested with low-pressure air. At the Contractor's option, sewers may be tested in lengths between manholes or in short sections (25 feet or less) using inflatable balls pulled through the line from manhole to manhole. Air shall be slowly supplied to the plugged sewer section until internal air pressure reaches approximately 4.0 psi. After this pressure is reached and the pressure allowed to stabilize (approximately two to five minutes), the pressure may be reduced to 3.5 psi before starting the test. If a 1.0 psi drop does not occur within the test time, then the line has passed the test. If the pressure drops more than 1.0 psi during the test time, the line is presumed to have failed the test, and the Contractor will be required to locate the failure, make necessary repairs, and retest the line. Minimum test time for various pipe sizes, in accordance with ASTM C 828 is as follows:

Nominal Pipe Size, Inches	T (Time Min/100) Feet
6	0.7
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4
21	3.0
24	3.6

ASTM requirements for 24" and smaller pipe is extrapolated for larger diameter pipe, as follows:

Nominal Pipe Size, Inches	T (Time Min/100 Feet), extrapolated
30	4.8
36	6.0

2. Required test equipment, including inflatable balls, braces, air hose, air source, timer, rotameter as applicable, cut-off valves, pressure reducing valve, 0-15 psi pressure gauge, 0-5 psi pressure gauge with gradations in 0.1 psi and accuracy of ± two percent, shall be provided by the Contractor. Testing equipment shall be equal to Cherne Air-Loc Testing Systems.

3. The Contractor shall keep records of all tests made. Copy of such records will be given to the Owner and/or Engineer. Such records shall show date, line number and stations, operator, and such other pertinent information as required by the Owner and/or Engineer.

4. The Contractor is cautioned to observe proper safety precautions in performance of the air testing. It is imperative that plugs be properly secured and that care be exercised in their removal. Every precaution shall be taken to avoid the possibility of over-pressurizing the sewer line.

b. Deflection Test:

1. Test PVC gravity sewer for excessive deflection by passing a mandrel through the pipe. Deflection of the pipe shall not exceed the following:

Nominal Pipe Diameter	Maximum Allowable Deflection
≤ 12-inches	5%
15 to 30-inches	4%
> 30-inches	3%

2. The mandrel size shall be based upon 95% of the maximum possible inside diameter for the type of pipe being tested, taking into account the allowable manufacturing tolerances of the pipe. The mandrel shall have an odd number of legs, or vanes, with a quantity of such equal to or greater than nine. The legs of the mandrel shall be permanently

attached to the mandrel. A mandrel with variable sizes shall not be allowed. The mandrel shall be constructed of steel aluminum or other material approved by the Owner and/or Engineer, and shall have sufficient rigidity so the legs of the mandrel will not deform when pulling through a pipe. The mandrel dimensions shall be checked by the Owner and/or Engineer before use by the Contractor.

3. Excavate and install properly any section of pipe not passing this test. Re-test until results are satisfactory.

4. The test shall be performed within the first 30 days of installation and during final inspection, at the completion of this contract.

5. The mandrel shall be performed in accordance with ASTM D 3034, F679, or 2122.

c. Closed Circuit Television: Per Supplementary Conditions Section B.

C. Manholes: Prior to testing manholes for water tightness, all lift holes shall be plugged with a non-shrink grout, all joints between Precast sections shall be properly sealed and all pipe openings shall be temporarily plugged and properly braced. Each manhole shall pass the following tests:

1. Vacuum Tests: The manhole, after proper preparation as noted above, shall be vacuum tested prior to backfilling. The test head shall be placed at the inside of the top of the cone section and the compression head inflated to 40 psi to effect a seal between the vacuum base and the manhole structure. Connect the vacuum pump to the outlet port with the valve open. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9-inches. The manhole shall pass if the time is greater than 60 seconds for 48-inch diameter manholes. If the manhole fails the initial test, necessary repairs shall be made with non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained. Vacuum testing equipment shall be equal to that as manufactured by P.A. Glazier, Inc. or Cherne Industries.

D. Re-Testing: Any alterations made to pipeline or manholes performed after initial testing shall be re-tested and pass again, regardless of initial test results.

E. Notification: Owner and/or Engineer shall be notified 24-hours in advance prior to Contractor performing any testing.

3.18 PROTECTION AND RESTORATION OF WORK AREA

A. General: Return all items and all areas disturbed, directly or indirectly by work under these Specifications, to their original condition or better, as quickly as possible after work is started.

1. The Contractor shall plan, coordinate, and prosecute the work such that disruption to personal property and business is held to a practical minimum.

2. All construction areas abutting lawns and yards of residential or commercial property shall be restored promptly. Backfilling of underground facilities, ditches, and disturbed areas shall be accomplished on a daily basis as work is completed. Finishing, dressing, and grassing shall be accomplished immediately thereafter, as a continuous operation within each area being constructed and with emphasis placed on completing each individual yard or business frontage. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.

3. Handwork, including raking and smoothing, shall be required to ensure that the removal of roots, sticks, rocks, and other debris is removed in order to provide a neat and pleasing appearance.

B. Man-Made Improvements: Protect, or remove and replace with the Owner and/or Engineer's approval, all fences, walkways, mail boxes, pipe lines, drain culverts, power and telephone lines and cables, property pins and other improvements that may be encountered in the work.

C. Cultivated Growth: Do not disturb cultivated trees or shrubbery unless approved by the Owner and/or Engineer. Any such trees or shrubbery which must be removed shall be heeled in and replanted under the direction of an experienced nurseryman.

D. Cutting of Trees: Do not cut trees for the performance of the work except as absolutely necessary. Protect trees that remain in the vicinity of the work form damage from equipment. Do not store spoil from excavation against the trunks. Remove excavated material stored over the root system of trees within 30 days to allow proper natural watering of the root system. Repair any damaged tree over 3-inches in diameter, not to be removed, under the direction of an experienced nurseryman. All trees and brush that require removal shall be promptly and completely removed from the work area and disposed of by the Contractor. No stumps, wood piles, or trash piles will be permitted on the work site.

E. Disposal of Rubbish: Dispose of all materials cleared and grubbed ruing the construction of the project in accordance with the applicable codes and rules of the appropriate city and/or county, state and federal regulatory agencies.

D. Swamps and Other Wetlands:

1. The Contractor shall not construct permanent roadbeds, berms, drainage structures or any other structures which alter the original topographic features within the easement.

2. All temporary construction or alterations to the original topography will incorporate measures to prevent erosion into the surrounding swamp or wetland. All areas within the easement shall be returned to their original topographic condition as soon as possible after work is completed in the area. All materials of construction and other non-native materials shall be disposed by the Contractor.

3. The Contractor shall provide temporary culverts or other drainage structures, as necessary, to permit the free migration of water between portions of a swamp, wetland or stream which may be temporarily divided by construction.

4. The Contractor shall not spread, discharge or dump any fuel oil, gasoline, pesticide, or any other pollutant to adjacent swamps or wetlands.

END OF SECTION

SECTION 02531
SANITARY SEWER FORCE MAIN

PART 1 – GENERAL

1.01 SCOPE

A. This section of the Specifications describes products to be incorporated into the sanitary sewer and requirements for the installation and use of these items. The contractor shall furnish all products and perform all labor necessary to fulfill the requirements of these Specifications. It includes, but is not limited to the construction of the following items.

1. Force Main
2. Connection to Existing System
3. All necessary appurtenances to collect the wastewater and deliver it to the existing system.

1.02 RELATED WORK

A. Other work required for the construction of the sanitary sewer collection system is specified in the following specifications:

Section No.	Title
02225	Excavation, Trenching and Backfilling for Utilities
02230	Site Clearing
02370	Soil Erosion Control
02920	Grassing

1.03 MEASUREMENT AND PAYMENT – No separate measurement or payment will be made for installation of items associated with this work.

1.04 REFERENCES

A. ASTM D 3740-94a – Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

B. ASTM E 329-93b – Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

C. ANSI/AWWA C 150/A-21.50-96 – Thickness Design of Ductile Iron Pipe.

D. AWWA C906 – High Density Polyethylene Pipe and Fittings, 4 in. – 63 in.

E. ASTM D 2737 – Standard Specification for Polyethylene Plastic Tubing.

F. ASTM D 2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping.

G. ASTM C 478-94 – Precast Reinforced Concrete Manhole Sections.

H. ACI 318-89 – Building code Requirements for Reinforced Concrete.

I. ASTM C 39-94 – Compressive Strength of Cylindrical Concrete Specimens.

J. ASTM C 890-91 – Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.

K. ASTM C 891-90 – Installation of Underground Precast Concrete Utility Structures.

L. ASTM C 913-89 – Precast Concrete Water and Wastewater Structures.

M. ASTM A 615/A 615 M-95b – Deformed and Plain Billet – Steel Bars for Concrete Reinforcement.

N. AASHTO T 191-91 – Density of Soil in-Place by the Sand-Cone Method.

O. ASTM D 2922-91 – Test Methods for Density of Soil and Soil Aggregate in Place By Nuclear Methods (Shallow Depths).

P. ASTM D 1557-91 – Laboratory Compaction Characteristics of Soil Using Modified Effort.

Q. ASTM D 1556-90 – Density and Unit Weight of Soil in Place by the Sand Cone Method.

R. ANSI/AWWA C 111/A 21.11-95 – Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings.

S. ASTM A 377-95 – Index and Specifications for Ductile Iron pressure Pipe and Fittings.

T. ANSI/AWWA C 600-93 – Installation of Ductile Iron Water Mains and their appurtenances.

U. ASTM C890-73 (Latest Revision) – Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete for Water and Wastewater Structures.

V. ASTM C891-78 (Latest Revision) – Standard Practice for Installation of Underground Precast concrete Utility Structures.

W. ASTM C913-79 (Latest Revision) – Precast Concrete Water and Wastewater Structures.

X. *1990 Edition of the Recommended Standards for Wastewater Facilities, Great Lakes – Upper Mississippi River Board of State Public Health and Environmental Manages, Section 38.31*.

1.05 OPTIONS

A. The specifications describe several materials. Where manufacturers and models of equipment are named in the specification, it is intended that these are to describe the quality and function required. The Contractor may use equipment or materials of other manufacturers provided they are reviewed and accepted by the Engineer and the Owner as meeting the specifications prior to the bid date.

B. The Contractor will furnish the Engineer and the Owner a description of all materials before ordering. The Engineer and Owner will review the Contractor's submittals and provide in writing an acceptance or rejection of material. However, an acceptance of any material by the Engineer does not relieve the Contractor of his responsibility to meet the requirements of the construction plans or these specifications.

1.06 QUALITY ASSURANCE

A. Material and equipment shall be the standard product of a manufacturer who has manufactured them for a minimum of 2 years and who provides published data on the quality and performance of the project.

B. A Subcontractor for any part of the work must have experience on similar work and if required, furnish the Engineer with a list of projects and the Owners or Engineers who are familiar with his competence.

C. Devices, equipment, structures, and systems not designated by the Engineer that the Contractor wishes to furnish shall be designed either by a registered professional engineer or by someone the Engineer approved as qualified. If required, complete design calculations and assumptions shall be furnished to the Engineer or the Owner before acceptance.

D. All testing of the piping shall be made by the Contractor with equipment qualified by the Owner, Engineer, or utility company and in the presence of the Engineer, Owner and utility company. The Engineer or his representative reserves the right to accept or reject testing equipment.

E. Soil testing shall be done by a testing laboratory regularly engaged in soil testing, and shall be approved by the Engineer prior to engagement. Mill certificates of

test on materials made by manufacturers will be accepted provided the manufacturer maintains an adequate testing laboratory, makes regularly scheduled tests that are spot checked by an outside laboratory, and furnishes satisfactory certificates with the name of the one making the test.

1.07 PRODUCT DELIVERY, STORAGE & HANDLING

A. Shall be as described in Section 01611 –Protection and Storage.

1.08 ALTERNATIVES

A. The intention of these specifications is to produce the best system for the Owner. If the Contractor suggests that alternate material, equipment or procedures will improve the results at no additional costs, the Engineer and the Owner will examine the suggestion and if it is accepted, it may be used. The basis upon which acceptance of an alternate will be given is its value to the Owner, and not for the convenience of the Contractor.

1.09 GUARANTEE

A. The contractor shall guarantee the quality of the materials, equipment, and workmanship for 12 months after acceptance of the completed Project. Defects discovered during that period shall be repaired by the Contractor, at no cost to the Owner. The Performance bond shall reflect this guarantee.

B. The manufacturers of equipment, valves, pumps, controls, measuring devices and special equipment shall test the equipment at field conditions for compliance with the specifications. The manufacturer shall guarantee his product to be free from defects in material and factory workmanship for a period of 1 year from date of acceptance of the completed project, provided the product is properly installed, serviced and operated under normal conditions according to the manufacturer's instructions. The manufacturer shall furnish the Engineer with a certificate that the equipment meets the specifications and will perform as required. The manufacturer shall furnish four field trips to the project by a service representative during the first year after completion of the Project at no cost to the Owner.

1.10 EXISTING UTILTIES

A. All known utility facilities are shown schematically on plans, and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown on plans will not relieve the contractor of his responsibility under this requirement. "Existing Utilities Facilities" means any utility that exists on the projects in its original, relocated or newly installed position. The Contractor will be held responsible for the cost of repairs to damaged underground facilities: even when such facilities are not shown on the plans. The Contractor shall contact all utility companies prior to beginning work

and request an accurate field location of their respective utility lines. Call Before You Dig (800) 282-7411 Utilities Protection Center 72 Hours Prior to Digging.

B. Damage to any part of the existing utility system facilities by the Contractor or Subcontractors, that is repaired by the user's and Owner's forces, shall be charged to the Contractor on the basis of time and material, plus 30% for overhead and administration.

1.11 JOB CONDITIONS

A. The installation of the wastewater collection system must be coordinated with other work on the site. Generally, the wastewater pipes will be installed first and shall be backfilled and protected so that subsequent excavating and backfilling of other utilities does not disturb them. The Contractor shall replace or repair any of the damaged pipe or structure.

1.12 SEQUENCING AND SCHEDULING

A. The Contractor shall arrange his work so that all clearing and grubbing and blasting of rock shall be accomplished within the first 30 days of construction work.

1.13 ACCEPTANCE OF PORTIONS OF WORK

A. The Owner reserves the right to accept and use any portion of the work whenever it is considered in the public interest to do so.

1.14 RECORD DATA

A. It will be required of the Contractor to keep accurate, legible records of the location of any deviations from the construction drawings, any additional items or structures to the construction drawings. These records will be made available to the Engineer before his inspection for incorporation into the Engineer's Record Drawings.

PART 2 – PRODUCTS

Products and materials used in the work shall conform to the following:

2.01 SANITARY SEWER FORCE MAIN PIPE

A. PVC Pipe (AWWA C900, DR14) Pipe shall conform to AWWA C151, latest revision. Pipe shall be UL listed, FM approved.

B. HDPE Pipe (AWWA C906, DR9)

1. Method of Pipe Delivery – Piping shall be delivered to the job site in 20 or 40 linear foot sections for pipe greater than or equal to 5" diameter (nominal), and shall be delivered and installed from spools for pipe less than or equal to 4" in diameter (nominal).

2. Manufacturers:
   Manufacturers that are qualified and approved by the Project Engineer are listed below. Products from unapproved manufacturers are prohibited.

   ISCO Industries, LLC
   Performance Pipe, Inc.
   JM Eagle

   Materials used for the manufacture of polyethylene pipe and fittings shall be PE4710 high density polyethylene meeting cell classification 445574C per ASTM D 3350; and shall be listed in the name of the pipe and fitting Manufacturer in PPI1 TR-4, Recommended Hydrostatic Strengths and Design Stresses for Thermoplastic Pipe and Fittings Compounds, with a standard grade rating of 1600 psi at 73 degrees (F). The Manufacturer shall certify that the materials used to manufacture pipe and fittings meet these requirements.

3. Interchangeability of Pipe and Fittings: Polyethylene pipe and fittings shall be produced by the same Approved Manufacturer. Products made by sub-contractors or Manufacturer's distributor are not acceptable. Pipe and fittings from different Approved Manufacturers shall not be interchanged.

4. Polyethylene Pipe

   Polyethylene pipe shall be manufactured in accordance with ASTM D 3035, Polyethylene (PE) Plastic Pipe and shall be so marked. Each production lot of pipe shall be tested for (from material or pipe) melt index, density, % carbon, (from pipe) dimensions and either quick burst or ring tensile strength (equipment permitting). Pipe shall be DR-9 rated, or as shown in the Plans. Force Main and header piping shall be DIPS and DR-9 or of the DR called out in the plans.

5. Service Identification Stripes

   Permanent identification of piping service shall be provided by co-extending four equally spaced color stripes into the pipe outside surface. The striping material shall be the same material as the pipe material except for color. The following colors shall be used to identify piping service:

   Green stripes – sanitary sewer and force mains

Stripes printed on the pipe outside surface shall not be acceptable.

6. Polyethylene Fittings & Custom Fabrications

   Polyethylene fittings and custom fabrications shall be molded or fabricated by the pipe manufacturer. Butt fusion outlets shall be made to the same outside diameter, wall thickness, and tolerances as the mating pipe. All fittings and custom fabrications shall be fully rated for the same internal pressure as the mating pipe. Pressure de-rated fabricated fittings are prohibited.

7. Molded Fittings

   Molded fittings shall be manufactured in accordance with ASTM D 3261, Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing, and shall be so marked. Each production lot of molded fittings shall be subjected to the tests required under ASTM D 3261.

8. X-Ray Inspection

   The Manufacturer shall submit samples from each molded fittings production lot to x-ray inspection for voids, and shall certify that voids were not found.

9. Fabricated Fittings

   Fabricated fittings shall be made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock, or molded fittings. Fabricated fittings shall be rated for internal pressure service equivalent to the full service pressure rating of the mating pipe. Directional fittings 16" IPS and larger such as elbows, tees, crosses, etc., shall have a plain end inlet for butt fusion and flanged directional outlets. Part drawings shall be submitted for the approval of the Project Engineer.

10. Polyethylene Flange Adapters

    Flange adapters shall be made with sufficient through-bore length to be clamped in a butt fusion joining machine without the use of a stub-end holder. The sealing surface of the flange adapter shall be machined with a series of small v-shaped grooves to provide gasketless sealing, or to restrain the gasket against blow-out. Flanged transitions are acceptable only for above-ground connection.

11. Back-up Rings & Flange Bolts

Flange adapters shall be fitted with lap joint flanges pressure rated equal to or greater than the mating pipe. The lap joint flange bore shall be chamfered or radiused to provide clearance to the flange adapter radius. Flange bolts and nuts shall be Grade 2 or higher. Flanged transitions are acceptable only for above-ground connection.

12. HDPE Adapters for Buried Transitions

Buried HDPE pipe to be connected to mechanical joint, bell-type joint or restrained joint pipe shall be provided at all transitions from HDPE pipe to non-HDPE pipe. Such restrained transitions shall include clamps, adapter kits, and other manufacturer approved restraint items so that the connection is fully restrained. The transitions shall have stiffeners, shall be compatible with the pipe to be connected and shall be butt-fused to the HDPE pipe to be so connected.

2.02 PIPE JOINTS & FITTINGS

A. Fittings FOR PVC – All fitting shall be ductile iron, compact in weight and size, with restrained joints meeting the requirements of AWWA C110/ANSI A21.10, or AWWA C153/ANSI A21.4, and with a minimum rated working pressure of 250 psi. All fittings must be "Flex Ring" or "Flextite" with a "Fast-Grip" Gasket by American. Fittings shall be mechanical joint and have a nominal wall thickness of Class 54 Ductile Iron Pipe. They shall be furnished with a bituminous outside coating and lined with Protecto 401 Ceramic Epoxy or equal. Special adapters shall be provided, as recommended by the manufacturer, to adapt the PVC pipe to mechanical jointing with cast or ductile iron pipe, fittings or valves.

B. Fittings FOR HDPE PIPE – All fittings shall be butt-fused as described above.

C. Thrust Blocking – Concrete having compressive strength of not less than 3000 psi shall be used as a cradle or thrust blocking where shown on the plans or where directed by the Engineer. Bends exceeding 22-1/4 degrees, crosses with one opening plugged, and all tees shall be backed with concrete as a thrust block. Blocking shall be placed between solid ground and the fitting to be anchored; the area of bearing on the pipe and on ground in each instance shall be that shown on the plans. The blocking shall be so placed that the pipe fitting joints will be accessible for repair. No extra payment will be made for the thrust blocks.

2.03 PLUG VALVES

A. Plug valves shall be 100% Port Eccentric Plug Valves designed to meet the following standards:

- AWWA C517-05 Resilient-Seated Cast-Iron Eccentric Plug Valve
- ANSI flange drilled conforms to ANSI B16.1, Class 125 MJ joint end connections conform to ANSI/AWWA C11 1/A21.11.

B. Plug valve shall have a direct pressure, weatherproof nut actuator for buried use or chairwheel/chain where specified. Non-buried valves shall be handwheel or lever operated as space requires.

C. Interior and exterior of the valve shall be coated with an ANSI/NSF 61 approved two-part epoxy.

2.04 VALVE BOXES

A. All buried valves shall have cast iron two or three piece valve boxes with cast iron covers. Valve boxes shall be provided with suitable heavy bonnets and to extend to such elevation at or slightly above the finished grade surface as directed by the Engineer. The barrel shall be one or two-piece, screw type, having 5-1/4-inch shaft. Covers shall have "SEWER" cast into the top for all force mains and "DRAIN" cast into the top of all drain line. All valves shall have actuating nuts extended to within six inches of the top of valve box cover.

B. Valve boxes shall be provided with concrete base and valve nameplate with suitable anchors for casting in concrete. Nameplate shall be 3-inch diameter bronze disk with raised lettering 1/8-inch high as shown on the Drawings and manufactured by Shiedow Bronze Corporation, Kingwood, W. VA; or equal.

2.05 STONE BACKFILL

A. Shall be graded crushed granite #78 stone as required on the plans.

2.06 COMBINATION AIR VALVES (FOR FORCE MAINS)

A. Wastewater Combination Air Valves shall be automatic float operated valves designed to exhaust large quantities of air during the filling of a piping system and close upon liquid entry. The valve shall open during draining or if a negative pressure occurs. The valve shall also release accumulated air from a piping system while the system is in operation and under pressure. The valve shall perform the functions of both Wastewater Air Release and Wastewater Air/Vacuum Valves.

The valve body and cover shall be constructed of ASTM A126 Class B cast iron. The float, plug, guide shafts, and bushings shall be constructed of Type 316 stainless steel. Non-metallic guides and bushings are not acceptable. Resilient seats shall be Buna-N.

The exterior of the valve shall be coated with a universal alkyd primer.

Wastewater Combination Air Valves shall be CRISPIN or VALMATIC or approved equal stainless steel pressure body with outlet of size as shown on the plans. Where sizes are not shown, all pipes 14" in nominal diameter or smaller shall be fitted with 2" Wastewater Combination Air Valves, and larger pipes shall be fitted with 3" Wastewater Combination Air Valves.

2.07 METAL DETECTION

A. Detection tape shall be composed of a solid aluminum foil encased in a protective plastic jacket. Tapes shall be color coded in accordance with APWA color codes with the following legends: Sanitary Sewerage Systems, Safety Green, "Caution: Sewer Line Buried Below". Colors may be solid or striped. Tape shall be permanently printed with no surface printing allowed. Tape width shall be minimum 3-inches in width. Detection tape shall be equal to Lineguard Type III Detectable or Allen Systems Detectatape.

2.08 TRACER WIRE

A. Tracer Wire shall be bare 12 gage copper wire secure to pipe a minimum of three (3) times per joint of 10' O.C.

PART 3 – EXECUTION

3.01 ON-SITE OBSERVATION

A. The Engineer shall have the right to require that any portion of the work be done in his presence and if any work is covered up after such instruction, it shall be exposed by the Contractor for observation. However, if the Contractor notifies the Engineer that such work is scheduled and the Engineer fails to appear within 48 hours, the Contractor may proceed without him. All work done and materials furnished shall be subject to review by the Engineer or Project Representative. All improper work shall be reconstructed and all materials which do not conform to the requirements of the specifications shall be removed from the work upon notice being received from the Engineer for the rejection of such materials. The Engineer shall have the right to mark rejected materials so as to distinguish them as such.

3.02 HANDLING MATERIALS

A. Unloading: Furnish equipment and facilities for unloading, handling, distributing and storing pipe, fittings, valves and accessories. Make equipment available at all times for use in unloading. Do not drop or dump materials. All materials dropped or dumped will be subject to rejection without additional justification.

B. Handling: Handle pipe, fittings, valves and accessories carefully to prevent shock or damage. Handle pipe by rolling on skids, forklift, or front loader. Do not use material damaged in handling.

C. Distribution: Distribute and place pipe and materials to not interfere with traffic. Do not string pipe more than 300 feet beyond the area where pipe is being laid. Do not obstruct drainage ditches.

D. Storage: Store all pipe which cannot be distributed along the route. Make arrangements for the use of suitable storage areas. Do not interfere with other contractors right to access.

3.03 CONSTRUCTION ALONG HIGHWAYS, STREETS AND ROADWAYS

A. Install pipelines and accessories along highway, streets and roadways in accordance with the applicable regulations of the County, City and/or the Department of Transportation with reference to construction operations, safety, traffic control, road maintenance and repair.

1. Protection of Traffic: Provide and maintain suitable signs, barricades and lights for protection of traffic.
2. Replace all highway signs removed for construction as soon as possible. Do not close or block any highway, street, or roadway without first obtaining permission from the proper authorities.
3. Provide flagmen to direct and expedite the flow of traffic.

B. Construction Operations: Perform all work along highways, streets and roadways to least interfere with traffic.

1. Stripping: Where the pipe line is laid along road shoulders, strip and stockpile all sod, topsoil and other material suitable for shoulder restoration.
2. Trenching, Laying and Backfilling: Do not open the trench any further ahead of pipe laying operations than is necessary. Backfill and remove excess material immediately behind laying operations. Complete excavation and backfill for any portion of the trench in the same day.
3. Shaping: Reshape damaged slopes, side ditches, and ditch lines immediately after completing backfilling operations. Replace topsoil, sod and any other materials removed from shoulders.

C. Excavated Materials: Do not place excavated material along highways, streets and roadways in a manner which obstructs traffic. Sweep all scattered excavated materials off of the pavements.

D. Drainage Structures: Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material and free to drain at all times.

E. Maintaining Highways, Streets, Roadways and Driveways: Maintain streets, highways, and roadways in suitable condition for movement of traffic until completion and final acceptance of the work. Use steel running plate to maintain traffic until pavement is completed.

3.04 EXISTING UNDERGROUND UTILITIES AND OBSTRUCTIONS

A. It is the responsibility of the Contractor to locate all existing utilities along the path of his construction. The drawings shall indicate underground utilities or obstructions that are known to exist. Where these or unforeseen underground utilities are encountered, the location and alignment of the watermain may be changed, upon written approval of the Engineer and Owner, to avoid interference.

3.05 CONNECTIONS TO EXISTING PIPE LINES

A. Before laying pipe, the Contractor shall locate the points of connection to existing pipe lines and uncover as necessary for the Engineer and Owner to confirm the nature of the connections to be made. The Contractor shall furnish materials and make the connection to all existing pipelines. The Contractor will be observed during construction of tie-ins by the Owner and the Engineer. The Contractor shall use all available practices and resources to minimize the time the customers are without service. The Contractor shall notify affected customers of a service outage at least 24 hours in advance.

3.01 PIPE DISTRIBUTION

A. Pipe shall be distributed and placed in such a manner that will not interfere with traffic.

B. No pipe shall be strung further along the route than 300 feet beyond the area in which the Contractor is actually working without written permission from the Owner and/or Engineer. The Owner and/or Engineer reserves the right to reduce this distance to a maximum distance of 200 feet in residential and commercial areas based on the effects of the distribution to the adjacent property owners.

C. No street or roadway may be closed for unloading of pipe without first obtaining permission from the proper authorities. The Contractor shall furnish and maintain proper warning signs and obstruction lights for the protection of traffic along highways, streets and roadways upon which pipe is distributed.

D. No distributed pipe shall be placed inside drainage ditches.

E. Distributed pipe shall be placed as far as possible from the roadway pavement, but no closer than five feet from the roadway pavement, as measured edge-to-edge.

F. Contractor shall not excavate sanitary sewer trenches more than 400 feet in advance of pipe laying.

3.02 LOCATION AND GRADE

A. The Drawings show the alignment and grade of the force main and the position of other appurtenances. The slope shown on the gravity sewer profile and/or called for in the Specifications is the slope of the invert of the pipe.

B. After the Contractor locates and marks the manhole centerlines or baselines of the gravity sewer, the Contractor shall perform clearing and grubbing.

3.03 LAYING AND JOINTING PIPE AND ACCESSORIES

A. Lay all pipe and fittings to accurately conform to the lines and grades established by the construction drawings.

B. Pipe Installation:

1. Proper implements, tools and facilities shall be provided for the safe performance of the Work. All pipe, fittings and valves shall be lowered carefully into the trench by means of slings, ropes or other suitable tools or equipment in such a manner as to prevent damage to sewer materials and protective coatings and linings. Under no circumstances shall sewer materials be dropped or dumped into the trench.
2. All pipe, fittings, valves and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the Owner and/or Engineer, who may prescribe corrective repairs or reject the materials.
3. All lumps, blisters and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and free from dirt, sand, grit or any foreign materials before the pipe is laid. No pipe which contains dirt shall be laid.
4. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing or other materials shall be placed in the pipe at any time.
5. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.
6. It is common practice to lay pipe with the bells facing the direction in which work is progressing.
7. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade shall not be permitted.

C. Alignment and Gradient:

1. Lay pipe straight in alignment and gradient or follow true curves, where shown on the Drawings, as nearly as practicable. Do not deflect any joint more than the maximum deflection recommended by the manufacturer.
2. Maintain a transit, level and accessories on the job to lay out angles and ensure that deflection allowance are not exceeded.
3. The Contractor shall check the invert elevation at each manhole and the gravity sewer invert elevation at least three times daily, start, mid-day and end of day. Elevations shall be checked more frequently if more than 100 feet of pipe is installed in a day or if the gravity sewer is being constructed at minimum slope.
4. The Contractor shall check the horizontal alignment of the gravity sewer at the same schedule as for invert elevations.
5. Should any installed pipe have its alignment, grade, or joints disturbed after placement, it shall be taken up and relaid.

D. Expediting of Work: Excavate, lay the pipe, and backfill as closely together as possible. Do not leave unjointed pipe in the trench overnight. Backfill and compact the trench as soon as possible after laying and jointing is completed. Cover the exposed end of the installed pipe each day at the close of work and at all other times when work is not in progress. If necessary to backfill over the end of an uncompleted pipe or accessory, close the end with a suitable plug, either push-on, mechanical joint, restrained joint or as approved by the Owner and/or Engineer.

E. Joint Assembly:

1. Push-on, mechanical, flange and restrained type joints shall be assembled in accordance with the manufacturer's recommendations.
2. Each restrained joint shall be inspected by the Contractor to insure that it has been "homed" 100%.

F. Cutting Pipe:

1. Cut ductile iron pipe using an abrasive wheel saw.
2. Cut PVC pipe using a suitable saw.
3. Remove all burrs and smooth the end before jointing.
4. The Contractor shall cut the pipe and bevel the end, as necessary, to provide the correct length of pipe necessary for installing the fittings, valves, accessories and closure pieces in the correct location. Only push-on or mechanical joint pipe shall be cut.
5. House Connections: Install wyes or tees in locations designated on the plans for connection of service lines. Plug the branch of the wye or tee. Record the location of fittings installed on the Record Drawings.

G. Fitting Installation:

1. Fittings, plugs and caps shall be set and joined to the pipe in the manner specified in this Section for cleaning, laying and joining pipe.

3.04 SEPARATION BETWEEN WATER & SANITARY SEWER

A. Parallel separation shall be 10 feet horizontal between sanitary sewers and any existing or proposed water mains. Deviation may be authorized for closer installation provided that the sewer is laid in a separate trench such that the bottom of the water main is at least 18 inches above the top of the sewer. Sanitary sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches of vertical clearance, both water and sewer line. Where there is less than 18 inches of vertical clearance, both water and sewer lines shall be ductile iron for one full length each side of the crossing with the water pipe joints located as far as possible from the sewer crossing.

3.05 EXCAVATING, TRENCHING AND BACKFILLING

A. Refer to Section 02225.

3.06 CONNECTION TO AN EXISTING MANHOLE

A. Connection to an existing manhole shall be made by mechanically coring into the wall structure of the manhole. Cored opening shall be sized to properly accommodate a rubber boot seal as specified in this section.

3.07 CONNECTION AND REPAIRS TO AN EXISTING SEWER MAIN

A. Where connections or repairs are required, Contractor shall only use solid sleeves and provide all materials and labor necessary to make the connection or repair to the existing pipeline, excluding service lines 6” or smaller.

3.08 CONCRETE COLLARS

A. Construct collars as shown on the Drawings.

3.09 DETECTION TAPE

A. Detection tape shall be provided over all force main constructed by the open cut method.

3.10 TRACER WIRE

A. Tracer Wire shall be provided for all pipe constructed by open cut method.

3.11 THRUST RESTRAINT

A. Thrust restraint for force main should follow guidelines shown.

3.12 INSPECTION AND TESTING

A. Clean and flush lines prior to testing. Clean and test lines before requesting final acceptance. Where any obstruction is met, clean the sewers by means of rods, swabs or other instruments. When requested by the Owner and/or Engineer, flush out lines and manholes before final inspection.

B. Gravity Sewers: Pipe lines shall be straight and show a uniform grade between manholes. Correct any discrepancies discovered during inspection. Televising of the sewer lines is required by the Macon Water Authority prior to final acceptance after other tests are completed. See Supplementary Conditions Section B for Policy.

1. Infiltration Tests: Not Included.
2. Exfiltration Tests:
    a. Low-Pressure Air Test:
        1. Prior to air testing, the section of sewer between manholes shall be thoroughly cleaned and wetted. Immediately after cleaning or while the pipe is water soaked, the sewer shall be tested with low-pressure air. At the Contractor's option, sewers may be tested in lengths between manholes or in short sections (25 feet or less) using inflatable balls pulled through the line from manhole to manhole. Air shall be slowly supplied to the plugged sewer section until internal air pressure reaches approximately 4.0 psi. After this pressure is reached and the pressure allowed to stabilize (approximately two to five minutes), the pressure may be reduced to 3.5 psi before starting the test. If a 1.0 psi drop does not occur within the test time, then the line has passed the test. If the pressure drops more than 1.0 psi during the test time, the line is presumed to have failed the test, and the Contractor will be required to locate the failure, make necessary repairs, and retest the line. Minimum test time for various pipe sizes, in accordance with ASTM C 828 is as follows:

Nominal Pipe Size, Inches	T (Time Min/100) Feet
4	0.7
6	0.7
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4
21	3.0
24	3.6

2. Required test equipment, including inflatable balls, braces, air hose, air source, timer, rotameter as applicable, cut-off valves, pressure reducing valve, 0-15 psi pressure gauge, 0-5 psi pressure gauge with gradations in 0.1 psi and accuracy of ± two percent, shall be provided by the Contractor. Testing equipment shall be equal to Cherne Air-Loc Testing Systems.
3. The Contractor shall keep records of all tests made. Copy of such records will be given to the Owner and/or Engineer. Such records shall show date, line number and stations, operator, and such other pertinent information as required by the Owner and/or Engineer.
4. The Contractor is cautioned to observe proper safety precautions in performance of the air testing. It is imperative that plugs be properly secured and that care be exercised in their removal. Every precaution shall be taken to avoid the possibility of over-pressurizing the sewer line.

C. Force Main Pressure and Leakage Test:

1. All section of pipeline subject to internal pressure shall be pressure tested in accordance with AWWA C 600. A Section of line will be considered ready for testing after completion of all thrust restraint and backfilling. Each segment of pipeline between line valves shall be tested individually.

1. Test Preparation
   a. Flush pipeline section thoroughly at flow velocities adequate to remove debris from pipe and valve seats. Partially operate valves and hydrants to clean out seats. Provide correctly sized temporary outlets in number adequate to achieve flushing velocities.
   b. Provide temporary blocking, bulkheads, flanges and plugs as necessary, to assure all new pipe, valves and appurtenances will be pressure tested.

c. Before applying test pressure, air shall be completely expelled from the pipeline and all appurtenances. Unless permanent air vents are in place, insert temporary corporation stops at highpoints to expel air as line is filled with water.
d. Fill pipeline slowly with water. Provide a suitable pump with an accurate water meter to pump the line to the specified pressure. Differential pressure at valves and hydrants shall equal the maximum possible, but shall not exceed manufacturer's pressure rating.

2. Test Pressure: Test the pipeline at 150 psi measured at the lowest point for at least two hours. The test pressure shall not vary by more than 5 psi for the test duration. Should the pressure drop more than 5 psi at any time during the test period, the pressure shall be restored to the specified test pressure. Provide an accurate pressure gauge with graduation not less than 5 psi.

3. Leakage:
a. Leakage shall be defined as the quantity of water that must be pumped into the test section equal to the sum of the water, to maintain pressure with 5 psi of the specified test pressure for the test duration plus water required to return line to test pressure at the end of the test. Leakage shall be the total cumulative amount measured on a water meter.
b. The Owner assumes no responsibility for leakage occurring through existing valves.

4. Test Results: No test section shall be accepted if the leakage exceeds the limits determined under Section 4 of AWWA C 600. The leakage test shall be repeated until the test section is accepted. All visible leaks shall be repaired regardless of leakage test results.

5. Completion: After a pipeline structure has been accepted, relieve test pressure. Record type, size and location of all outlets on record drawings.

D. Manholes: Prior to testing manholes for water tightness, all lift holes shall be plugged with a non-shrink grout, all joints between Precast sections shall be properly sealed and all pipe openings shall be temporarily plugged and properly braced. Each manhole shall pass one of the following tests:

1. Vacuum Tests: The manhole, after proper preparation as noted above, shall be vacuum tested prior to backfilling. The test head shall be placed at the inside of the top of the cone section and the compression head inflated to 40 psi to effect a seal between the vacuum base and the manhole structure. Connect the vacuum pump to the outlet port with the valve open. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9-inches. The manhole shall pass if

the time is greater than 60 seconds for 48-inch diameter manholes. If the manhole fails the initial test, necessary repairs shall be made with non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained. Vacuum testing equipment shall be equal to that as manufactured by P.A. Glazier, Inc. or Cherne Industries.

E. Re-Testing: Any alterations made to pipeline or manholes performed after initial testing shall be re-tested and pass again, regardless of initial test results.

F. Notification: Owner and/or Engineer shall be notified 24-hours in advance prior to Contractor performing any testing.

3.13 PROTECTION AND RESTORATION OF WORK AREA

A. General: Return all items and all areas disturbed, directly or indirectly by work under these Specifications, to their original condition or better, as quickly as possible after work is started.

1. The Contractor shall plan, coordinate, and prosecute the work such that disruption to personal property and business is held to a practical minimum.
2. All construction areas abutting lawns and yards of residential or commercial property shall be restored promptly. Backfilling of underground facilities, ditches, and disturbed areas shall be accomplished on a daily basis as work is completed. Finishing, dressing, and grassing shall be accomplished immediately thereafter, as a continuous operation within each area being constructed and with emphasis placed on completing each individual yard or business frontage. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.
3. Handwork, including raking and smoothing, shall be required to ensure that the removal of roots, sticks, rocks, and other debris is removed in order to provide a neat and pleasing appearance.

B. Man-Made Improvements: Protect, or remove and replace with the Owner and/or Engineer's approval, all fences, walkways, mail boxes, pipe lines, drain culverts, power and telephone lines and cables, property pins and other improvements that may be encountered in the work.

C. Cultivated Growth: Do not disturb cultivated trees or shrubbery unless approved by the Owner and/or Engineer. Any such trees or shrubbery which must be removed shall be heeled in and replanted under the direction of an experienced nurseryman.

D. Cutting of Trees: Do not cut trees for the performance of the work except as absolutely necessary. Protect trees that remain in the vicinity of the work form

damage from equipment. Do not store spoil from excavation against the trunks. Remove excavated material stored over the root system of trees within 30 days to allow proper natural watering of the root system. Repair any damaged tree over 3-inches in diameter, not to be removed, under the direction of an experienced nurseryman. All trees and brush that require removal shall be promptly and completely removed from the work area and disposed of by the Contractor. No stumps, wood piles, or trash piles will be permitted on the work site.

E. Disposal of Rubbish: Dispose of all materials cleared and grubbed ruing the construction of the project in accordance with the applicable codes and rules of the appropriate city and/or county, state and federal regulatory agencies.

D. Swamps and Other Wetlands:

1. The Contractor shall not construct permanent roadbeds, berms, drainage structures or any other structures which alter the original topographic features within the easement.
2. All temporary construction or alterations to the original topography will incorporate measures to prevent erosion into the surrounding swamp or wetland. All areas within the easement shall be returned to their original topographic condition as soon as possible after work is completed in the area. All materials of construction and other non-native materials shall be disposed by the Contractor.
3. The Contractor shall provide temporary culverts or other drainage structures, as necessary, to permit the free migration of water between portions of a swamp, wetland or stream which may be temporarily divided by construction.
4. The Contractor shall not spread, discharge or dump any fuel oil, gasoline, pesticide, or any other pollutant to adjacent swamps or wetlands.

END OF SECTION

SECTION 02532

SUPPLEMENTARY TECHNICAL STANDARDS
RESTORATION OF MANHOLES

PART 1 - GENERAL:

1.01 DESCRIPTION:

A. The work consists of spray applying a cementitious mix to the walls and benches of manholes in the Macon Water Authority jurisdiction, resulting in monolithic liner of a minimum one-half inch thickness. The applicator, approved and trained by the manufacturer shall furnish all labor, equipment and materials for installing Strong-Seal High Performance, Sewpercoat, or equivalent to the inside and outside of manholes. The installation shall be in accordance with the manufacturer's recommendations and Macon Water Authority criteria.

1.02 DEFINITION:

A. The term applicator as used herein shall describe a private contractor hired to perform designated manhole restoration with personnel trained for the specific application.

PART 2 - MATERIALS:

2.01 STRONG-SEAL HIGH PERFORMANCE:

A. A propriety pre-blended mixture of acid resistant cement, chemically active aggregates, fiberglass rods, and other additives specifically selected for special properties as manufactured by StrongLite Products Corporation and designated Strong-Seal High Performance or an approved equivalent.

2.02 SEWPERCOAT:

A. A proprietary pre-blended mixture of acid resistant ready to use mortar specifically designed to withstand corrosion related to hydrogen sulfide as well as abrasion as manufactured by LaFarge Calcium Aluminates, Inc. The material is designated as Sewpercoat.

2.03 FLEX-SEAL:

A. A propriety corrosion resistant aromatic flexible urethane resin to be applied internally to the wall of the adjustment ring. The material is specifically known as Flex-Seal Utility Sealant as manufactured by Sealing Systems, Inc. or an approved equal.

2.04 WATER:

A. Water mixed with these materials shall be clean and potable.

2.05 OTHER MATERIALS:

A. No other material shall be used in conjunction with or added to the selected material.

PART 3 – PROPERTIES:

3.01 PHYSICAL:

A. The density at placement shall be a minimum 95 pounds per cubic foot (pcf). The comprehensive strength, ASTM C-495 Standard, after a minimum of 28 days will be 3300 pounds per square inch (psi)

3.02 CHEMICAL:

A. The materials are formulated with a calcium cement for use in severe hydrogen sulfate environments, particularly when the product is in direct contact with acidic solutions.

PART 4 - APPLICATION:

4.01 INTERNAL:

A. The adjustment ring area under the casting shall receive a thickened flexible urethane to achieve a minimum thickness of 120 mils. The mil thickness is directly related to the expansion associated within the territories climate. The liner shall be applied by spray, brush, or trowel three inches above the bottom of the frame, and shall cover the entire adjustment ring area to three inches below the bottom adjustment ring.

4.02 EXTERNAL:

A. The adjustment ring area under the casting shall receive a thickened flexible urethane to achieve a minimum thickness of 120 mils. The mil thickness is directly related to the expansion associated within the territories climate. The liner shall be applied by spray, brush, or trowel two inches wide over the flange of the frame, and shall cover the entire adjustment ring areas to three inches below the bottom adjustment ring.

4.03 PREPARATION:

A. Place covers over invert before prepping.

1. All foreign materials shall be removed from the manhole walls and bench using high pressure water supply (minimum 1200 psi). Loose and protruding brick, mortar and concrete shall be removed using a mason hammer, chisel, and/or scrapers. Remove all the existing manhole steps. Fill any voids at least one hour prior to spray application of the first coat.

2. Active leaks shall be stopped using products specifically for that purpose and according to manufacturer's recommendations. Some leaks may require grouting to stop the inflow. Apply according to Strong Systems or equivalent manufacturer's grouting instructions.

3. After all preparation has been completed remove all loose material.

4. The ring adjustment area and the lower three inches on the casting frame and the top three inches of the cone/slab must be prepared according to the manufacturer's instructions.

5. All preparation methods shall be in accordance with manufacturer's instructions.

4.04 MIXING:

A. Any product used will be mixed according to manufacturer's instructions.

CAUTION: DO NOT OVER MIX AND DO NOT RUN PUMP EMPTY

B. Re-mixing or tempering will not be permitted. Rebound materials shall not be reused.

4.05 SPRAYING:

A. Any product used will be sprayed according to manufacturer's instructions.

4.06 TESTING

A. At least two three inch diameter by six inch tall cylinders of the cementitious material shall be taken from each day's work with the date, location, and job recorded on each. The cylinders shall be sent to a testing lab where a twenty-eight day compression test will be made and recorded.

B. Manholes: Prior to testing manholes for water-tightness all lift holes shall be plugged with a non-shrink grout, all joints between pre-cast sections

shall be properly sealed and all pipe openings shall be temporarily plugged and properly braced. Each manhole shall pass the following test.

1. Vacuum Test: The manhole, after proper restoration as noted above, shall be vacuum tested. The test head shall be placed at the inside of the top of the cone section and the compression head inflated to 40 psi to affect a seal between the vacuum base and the manhole structure. Connect the vacuum pump to the port with the valve open. A vacuum of five inches of Mercury shall be drawn in the manhole and the time measured for the vacuum to decay four inches. The manhole shall pass the test if the time is greater than 60 seconds for 48 inch diameter manholes, If the manhole fails the initial test, necessary repairs shall be made. Retesting shall proceed until a satisfactory test is obtained. Vacuum testing equipment shall be equal to that as manufactured by P.A. Glazier, Inc., or approved equivalent.

2. Flex-Seal Utility Sealant Test: American Society for Testing and Materials (ASTM) annual book of Standards.

ASTMD412	Test Method for Tensile Properties and Elongation
ASTMD903	Test Method for Adhesive Strength
ASTMC1244-93	Vacuum Test 10 inches for two minutes

PART 5 - MEASUREMENT AND PAYMENT

5.01 Manhole restoration will be measured on a vertical foot basis as in the bid and Section 1025 and paid at the unit price in the bid.

END OF SECTION

SECTION 02534

TECHNICAL REQUIREMENTS AND SPECIFICATIONS FOR LINING OF CONCRETE and BRICK STRUCTURES WITH CORROSION RESISTANT POLYMER LINER SYSTEM

PART 1 – GENERAL

Product Description: The lining system shall be a spray-applied polymer monolithic surfacing system for use in rehabilitation of sanitary sewer manholes and pump stations. The lining system shall be one of the following products:

- Tnemec Epoxy Series
- Or Pre-Approved Equal

This specification is for polymer manhole lining systems (i.e. epoxy and polyurethane type systems). The manufacturer of the lining shall furnish an affidavit attesting to the successful use of its material as a lining for concrete structures for a minimum period of 5 years in wastewater conditions recognized as corrosive or otherwise detrimental to concrete. The product must have an equivalent of 10,000 vertical feet (VF) of 48" or larger sanitary sewer manholes installation history.

Prior pre-approval is required to determine if the prospective product may be bid on this project. Without prior pre-approval within the specified time frame a product may be rejected as unacceptable. This time frame allows the Engineer ample time to determine if the proposed product is an acceptable alternative.

Interior Surfacing System

This specification covers work, materials, equipment and tools including specially developed application equipment as required for installation and testing of a field applied unique monolithic interior manhole surfacing system. The use of specialized application equipment combined with rigorous surface preparation requirements shall be used to apply the products without the use of solvents. Product application requirements and procedures described include surface preparation, mixing, application, material handling and storage, qualification of the applicator and application quality control.

SUBMITTALS

All submittals shall be submitted in accordance to the applicable portions of these specifications. Submittals must be stamped by a P.E. licensed in the State of Georgia.
Qualification and Performance Responsibility of Applicator:
Applicator shall provide documentation that Applicator is an approved installer and licensed by the monolithic surfacing manufacturer and specialized equipment supplier.

QUALITY ASSURANCE

The Applicator shall apply the system and be responsible for the complete performance of the system, including materials, application and quality control. The Applicator shall initiate and

enforce quality control procedures consistent with applicable ASTM standards. The Applicator shall use an adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts. These workmen shall be completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section. The Applicator shall use approved equipment adequate in size, capacity and number sufficient to accomplish the work in a timely manner.

DELIVERY, STORAGE, AND HANDLING

Materials are to be kept dry, protected from weather and stored under cover and stored between 50 deg F and 100 deg F. Materials should not be stored near flame, heat or strong oxidants. Protective coating materials are to be handled according to their material safety data sheets.

PART 2 – PRODUCTS AND APPLICATION EQUIPMENT

INTERIOR SURFACING SYSTEM

The interior surfacing system shall be continuously bonded to all brick, mortar, concrete, chemical sealant, grout, pipe and other surfaces inside the manhole according to ASTM C882 testing and therefore shall be designed for hydrostatic loading.

The finished system shall provide the following minimum coverage:

New Manhole and Wetwells	250 Mils
Existing Manhole and Wetwell Rehab	350 Mils

The cured surfacing shall be monolithic with proper sealing connections to all unsurfaced areas and shall be placed and cured in conformance with the recommendations of the monolithic surfacing system manufacturer. When cured, the system shall form a continuous, tight-fitting, hard, impermeable surfacing that is suitable for sewer system service and chemically resistant to any chemicals, bacteria or vapors normally found in domestic sewage. The system shall effectively seal the interior surfaces of the manhole and prevent any penetration or leakage of groundwater infiltration. The system shall be compatible with the thermal conditions of the existing sewer manhole surfaces.

PROTECTIVE COATING APPLICATION EQUIPMENT

The contractor shall use equipment designed for use in the spray or spin-cast application of the specified system approved for use by the monolithic surfacing system manufacturer.

PART 3 – EXECUTION

PRE-COAT INSPECTION

All surfaces including benches, joints, lift holes and walls shall be made smooth and suitable for application of the interior surfacing system. All benches and inverts shall be in place and complete. Active flows shall be dammed, plugged or diverted as required to ensure that the liquid flow is maintained below the surfaces to be coated. Installation of the protective coating shall not commence until the concrete substrate has properly cured.

SURFACE PREPARATION

Applicator shall inspect all surfaces specified to receive the monolithic surfacing system prior to surface preparation. Applicator shall notify Owner of any noticeable disparity in the surfaces that may interfere with the proper preparation or application of the monolithic surfacing system. All concrete that is not sound or has been damaged by chemical exposure shall be restored to a sound concrete surface. All contaminants including: all oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants shall be removed. Surface preparation method(s) shall be based upon the conditions of the substrate and the requirements of the monolithic surfacing system to be applied. Surfaces to receive protective coating shall be cleaned to produce a sound concrete surface with adequate profile and porosity to provide a strong bond between the monolithic surfacing system and the substrate. The first procedure upon entering each structure will be to blast all specified surfaces by low pressure water cleaning.

APPLICATION OF FIELD APPLIED INTERIOR SURFACING SYSTEM

Application procedures shall conform to the recommendations of the interior surfacing system manufacturer, including material handling, mixing, and environmental controls during application, safety, and equipment. The equipment shall be specially designated to accurately ratio and apply the specified materials and shall be regularly maintained and in proper working order. The specified materials must be applied by an approved installer of the monolithic surfacing system. The walls and bench of the manhole shall be lined with the monolithic surfacing system to provide a thickness as previously specified based on the condition of the existing structure. The cured surfacing shall be monolithic with proper sealing connections to all unsurfaced areas and shall be placed and cured in accordance with the recommendations of the monolithic surfacing system manufacturer.

TESTING AND INSPECTION

During application a wet film thickness gage, meeting ASTM D4414 – Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages, shall be used to ensure a monolithic coating and uniform thickness during application. The Engineer and Applicator shall make a final visual inspection. Any deficiencies in the finished system shall be marked and repaired according to the procedures set forth herein by Applicator.

END OF SECTION

SECTION 02920
GRASSING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Ground preparation, seeding, planting grass, fertilizing, and mulching of graded areas behind structures, over pipelines, in rights-of-way, roadway shoulders, and any other disturbed area.

B. Seed Protection.

C. Maintaining seeded areas until final acceptance.

1.02 RELATED SECTIONS

A. Section 02500 – Excavation, Trenching, and Backfilling for Utility Systems

B. Section 02370 – Erosion and Sedimentation Control

1.03 MEASUREMENT AND PAYMENT

A. There will be no separate measurement or payment for Grassing as outlined in the bid form.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging and location of packaging. Damaged packages are not acceptable.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer. Damaged bags are not acceptable.

C. All materials shall be acceptable to Engineer prior to use.

1.05 PLANTING DATES

A. This specification provides for the establishment of a permanent grass cover between the dates of March 1 and September 30. If finished earth grades are not completed in time to permit planting and establishment of the permanent grass during the favorable season between the dates specified above unless otherwise accepted, the Contractor will be required to plan a temporary cover to protect the new graded areas from erosion and to keep windblown dust to a minimum. The

temporary cover shall be planted between October 1 and February 28 unless otherwise permitted.

PART 2 – PRODUCTS

2.01 SEED

A. As shown on Plans.

B. All seed shall conform to all Georgia State Laws and to all requirements and regulations of the State of Georgia Department of Agriculture.

C. The varieties of seed shall be individually packaged or bagged, and tagged to show name of seed, net weight, origin, germination, lot number, and other information required by the State of Georgia Department of Agriculture.

D. The Engineer reserves the right to test, reject, or accept all seed before seeding.

2.02 FERTILIZER

A. Balanced commercial fertilizer of approved type, conforming to state fertilizer laws.

2.03 SEEDING SCHEDULE

A. As shown on Plans.

B. In areas where existing grass is to be matched, contractor shall sow seed at the rate and dates recommended by seed distributor.

2.04 LIME

A. Agricultural grade, ground limestone.

2.05 ACCESSORIES

A. Straw Mulch: Oat or wheat straw free from weeds, foreign matter detrimental to plant life, and in dry condition.

B. Excelsior Mulch: Excelsior mulch shall consist of wood fibers cut from sound, green timber. The average length of the fibers shall be 4 to 6 inches. The cut shall be made in such a manner as to provide maximum strength of fiber, but at a slight angle to the natural grain of the wood so as to cause splintering of the fibers when weathering in order to provide adherence to each other and to the soil.

C. Wood cellulose fiber shall be made from wood chip particles manufactured particularly for discharging uniformly on the ground surface when dispersed by a hydraulic water sprayer. It shall remain in uniform suspension in water under agitation and blend with grass seed and fertilizer to from homogenous slurry. The mulch fibers shall intertwine physically to form a strong moisture holding mat on the ground surface an allow rainfall to percolate into the underlying soil. The mulch shall be heat processed so as to contain no germination or growth-inhibiting factors. It shall be dyed (non-toxic) an appropriate color to facilitate metering of material.

2.06 PRODUCT REVIEW

A. The Contractor shall provide the Engineer with a complete description of all products before ordering. The Engineer will review all products before they are ordered.

PART 3 – EXECUTION

3.01 PREPARATION

A. The areas to be seeded shall be made smooth and uniform and shall conform to the finished grade indicated on the plans and blend in with adjacent grades.

B. Remove foreign materials, plants, roots, stones, and debris from surfaces to be seeded.

C. Grassing areas, if not loose, shall be loosened to a minimum depth of 3 inches before fertilizer, seed, or sod is applied.

3.02 STAND OF GRASS

A. Before acceptance of the seeding performed for -the establishment of permanent vegetation, the Contractor will be required to produce a satisfactory stand of perennial grass whose root system shall be developed sufficiently to survive dry periods and the winter weather and be capable of re-establishment in the spring.

B. Before acceptance of the seeding performed for the establishment of temporary vegetation, the Contractor will be required to produce a stand of grass sufficient to control erosion for a given area and length of time before the next phase of construction or the establishment of permanent vegetation is to commence.

3.03 SEEDING DATES

A. Seeding shall be performed during the periods and at the rates specified in the seeding schedules. Seeding work may, at the discretion of the Contractor, be performed throughout the year using the schedule prescribed for the given period.

Seeding work shall not be conducted when the ground is frozen or excessively wet. The Contractor will be required to produce a satisfactory stand of grass regardless of the period of the year the work is performed.

3.04 APPLYING LIME AND FERTILIZER

A. Following advance preparation and placing selected material for shoulders and slopes, lime, if called for based on soil tests and fertilizer, shall be spread uniformly over the designated areas and shall be thoroughly mixed with the soil to a depth of approximately 2 inches. Fertilizer shall be applied at the rate of 500 pounds per acre for the initial application unless otherwise directed by the Engineer. Lime shall be applied at the rate determined by the soil test. Unless otherwise provided, lime will not be applied for temporary seeding. In all cases where practicable, acceptable mechanical spreaders shall be used for spreading fertilizer. On steep slopes subject to slides and inaccessible to power equipment, the slopes shall be adequately scarified. Fertilizer may be applied on steep slopes by hydraulic thuds as a mixture of fertilizer and seed. When fertilizer is applied with combination seed and fertilizer drills, no further incorporation will be necessary. The fertilizer and seed shall be applied together when Wood Cellulose Fiber Mulch is used. Any stones larger than 2½ inches in any dimension, larger clod, roots, or other debris brought to the surface shall be removed.

3.05 SEEDING

A. Seed shall be sown within 24 hours following the application of fertilizer and lime and preparation of the seedbed as specified in Section 3.4. Seed shall be uniformly sown at the rate specified by the use of acceptable mechanical seed drills. Rotary hand seeders, power sprayers or other satisfactory equipment may be used on steep slopes or on other areas that are inaccessible to seed drills.

B. The seed shall be covered and lightly compacted by means of cultipacker or light roller if the drill does not perform this operation. On slopes inaccessible to compaction equipment, the seed shall be covered by dragging spiked chains, by light harrowing, or by other satisfactory methods.

C. Apply water with fine spray immediately after each area has been sown.

D. Do not sow seed when ground is too dry, during windy periods or immediately following a rain.

E. If permitted by the special provisions, wood cellulose fiber mulch or excelsior fiber mulch may be used.

3.06 SEED PROTECTION (STRAW MULCH)

A. All seeded areas seeded with permanent grasses shall be uniformly mulched in a continuous blanket immediately following seeding and compacting operations, using at least 2 tons of straw per acre.

3.07 SEED PROTECTION (EXCELSIOR MULCH)

A. Seed shall be sown as specified in Section 3.5. Within 24 hours after the covering of seed, excelsior mulch shall be uniformly applied at the rate of 2 tons per acre. The mulch may be applied hydraulically or by other acceptable methods. Should the mulch be placed in a dry condition, it shall be thoroughly wetted immediately after placing. The Engineer may require light rolling of the mulch to form a tight mat.

3.08 SEED PROTECTION (WOOD CELLULOSE FIBER MULCH)

A. After the lime has been applied and ground prepared as specified in Section 3.4, wood cellulose fiber muck shall be applied at the rate of 1,500 pounds per acre in a mixture of seed and fertilizer. Hydraulic equipment shall be used for the application of fertilizer, seed and slurry of the prepared wood pulp. This equipment shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix a slurry of the specified amount of fiber, fertilizer, seed and water. The slurry distribution lines shall be equipped with a set of hydraulic spray nozzles, which will provide an even distribution of the slurry on the various areas to be seeded. The slurry tank shall have a minimum capacity of 1,000 gallons.

B. The seed, fertilizer, wood pulp mulch, and water shall all be combined into the slurry tank for distribution of all ingredients in one operation by the hydraulic seeding method specified herein. The materials shall be combined in a manner recommended by the manufacturer. The slurry mixture shall be so regulated that the amounts and rates of application shall result in a uniform application of all materials at rates not less than the amount specified. Using the color of the wood pulp as a guide, the equipment operator shall spray the prepared seedbed with a uniform visible coat. The slurry shall be applied in a sweeping motion, in an arched stream so as to fall like rain, allowing the wood fibers to build upon each other until an even coat is achieved.

3.09 SODDING

A. Sod shall be placed between March 1 and December 1.

B. Sod shall be placed within 48 hours of cutting.

C. Sod shall be moist when laid and placed on moist ground. The sod shall be carefully placed by hand, beginning at the toe of slopes and working upwards. The length of the strips shall be at right angles to the flow of surface water. All joints shall be tightly butted and end joints shall be staggered at least 12 inches. The sod shall be immediately pressed firmly into the ground by tamping or rolling. Fill all joints between strips with fine screened soil. Sod on slopes shall be pegged with sod pegs to prevent movement. The sod shall be watered, mowed, weeded, repaired or otherwise maintained, to insure the establishment of a uniform healthy stand of grass until acceptance.

3.10 MAINTENANCE

A. Maintain seeded surfaces until final acceptance.

B. Maintenance shall consist of providing protection against traffic, watering to ensure uniform seed germination and to keep surface of soil damp, and repairing any areas damaged as a result of construction operations or erosion.

3.11 ACCEPTANCE

A. Before acceptance of the seeding performed for the establishment of permanent vegetation, the Contractor will be required to produce a satisfactory stand of perennial grass whose root system shall be developed sufficiently to survive dry periods and the winter weather and be capable of re-establishment in the spring.

END OF SECTION

SECTION 03000

ABANDONMENT GROUTING OF SEWER MAINS & MANHOLES

PART 1 -GENERAL

1.01 DESCRIPTION

A. This item shall govern the in place abandonment of approximately 3,000 l.f. of existing 18 inch sanitary sewer pipe as noted on the plans and shall include all work necessary to gain access to, prepare and place stabilized fill.

1.02 ABANDONMENT BY GROUT FILLING

A. The 18 inch sanitary sewer pipe to be abandoned in place shall be filled by pumping LDCC or flowable fill into the main. The main shall be completely filled as shown on the plans, leaving no voids or air spaces. The LDCC or flowable fill shall be as specified herein.

B. A pressure grout pump of suitable size shall be utilized in the grouting of the existing sewer pipe. Unless otherwise approved by the Engineer, the grout shall be pumped into the sewer pipe in an up-slope manner to remove trapped air or water and from the inlet (injection) end to the exit end (vent). Samples of any outgoing water/fluids (exit end) shall be made until the LDCC mix collected is the same as the LDCC being injected.

C. The grouting method shall adequately provide for the removal and legal disposal of existing sewer materials and fluids in the system.

1.03 SUBMITTALS

A. Submittals shall be made in accordance with the General Conditions. The Contractor shall submit a comprehensive grouting plan which details all of the means and methods for completing this work. The grouting plan, including the flowable fill or LDCC mix design shall be reviewed and approved by the Engineer prior to initiating the grouting program. Manufacturer's specifications, catalog cut sheets, and other engineering data shall also be submitted to demonstrate compliance with the specified requirements.

1.04 QUALITY ASSURANCE

A. A Georgia licensed utility contractor shall perform the pressure grouting of pipes and supply the LDCC or flowable fill. The utility contractor shall demonstrate pressure grouting experience on similar projects and provide references of completed products.

B. Provide mix design of LDCC of flowable fill.

C. Only use skilled workmen who are thoroughly trained, experienced, and familiar with the project requirements and the specified requirements and methods for proper performance of this work. The specialized batching, mixing and placing equipment shall be approved by the Engineer in a submittal made by the material supplier.

D. Wet density testing shall be performed during construction. During placement the flowable fill or LDCC wet density shall be checked and adjustments made as required to obtain the specified wet density at the point of placement. At hourly intervals during placement, monitor the wet density and adjust as necessary to maintain the specified wet density. During placement, collect samples for subsequent dry density and compressive strength testing by the Engineer.

PART 2 - MATERIALS

2.01 LOW DENSITY CELLULAR CONCRETE/GROUT (LDCC):

A. Low Density Cellular Concrete/Grout (LDCC) is light weight concrete/grout with a Portland cement base containing many small air cells uniformly distributed throughout the concrete/grout matrix. Simple and precise control of the volume of the air cells, produced mechanically by means of special foaming agents and equipment, results in controlled density over a broad range of 20 to 120 pcf. LDCC may also contain fine and coarse aggregates. The microscopic, uniformly dispersed air cells result in excellent workability and pumpability.

B. LDCC for pipe abandonment shall have a minimum 28-day compressive strength of 100 psi and a minimum wet density at the point of placement of 30 pcf.

C. LDCC products shall conform to:

Portland Cement	ASTM C-150
Water	Potable, clean, free of oil, acid, alkalies or other salts
Aggregates	ASTM C-33
Admixtures	ASTM C-494 or ASTM C-937
Pozzolans	ASTM C-618 and non-deleterious to the cellular foam
Cellular Foam	ASTM C-796 and ASTM C-869

2.02 FLOWABLE FILL

A. Shall be per Georgia Department of Transportation Specification Section 600 for Excavatable Flowable Fill.

B. Flowable fill is a mixture of Portland cement, fly ash, fine aggregate, air entraining admixture and water containing a low cementitious content for reduced strength development.

C. Mix Design Proportion Range:

1	Cement Type I	75-1000 lbs/yd^3 (45-60 kg/m^3)
2	Fly Ash	-
3	Water	*
4	** Air	15 to 35%
5	** 28-Day Compressive Strength	Maximum 100 psi (690 kPa)
6	** Unit Weight (Wet)	90-100 lbs/ft^3 (1440-1600 kg/m^3)
7a	* Mix designs shall produce a consistency that will result in a flowable self-leveling product at time of placement.	
8a	**The requirements for percent air, compressive strength, and unit weight are for laboratory designs only and are not intended for jobsite acceptance requirements.	

D. Related Georgia Department of Transportation Specifications incorporated for use in flowable fill are as follows:
1. Section 500 – Concrete Structure
2. Section 801 – Fine Aggregate
3. Section 830 – Portland Cement
4. Section 831 – Admixtures
   a. High air generators or foaming agents may be used in lieu of conventional air entraining admixtures and may be added at the jobsite and mixed according to manufacturers recommendation.
5. Section 880 - Water

PART 3 - EXECUTION

3.01 GROUTING OF SANITARY SEWER

A. Pump out sewer pipe to appropriate sanitary facilities prior to beginning fill placement. During placement of fill, compensate for irregularities in sewer pipe, such as obstructions, open joints, or broken pipe to ensure no voids remain unfilled.

B. Abandonment of the sewer line shall be accomplished by injecting the LDCC or flowable fill with sufficient pressure to completely fill the pipe. The method of installation shall be able to meet the requirements of completely filling the existing sewer force main. The method shall provide for the release of air and water.

C. The Contractor is responsible for the selection of the methods and materials to be used. Appropriate bulkheads shall be installed and approved by the Engineer to inject and retain the flowable fill or LDCC. LDCC or flowable fill shall be injected in an upslope manner to remove trapped air. Additional portals shall be installed for proper venting or verification of abandonment.

D. The Contractor shall repair any surface features damaged during abandonment.

E. The Contractor shall examine the areas and conditions under which the abandonment work shall be performed and correct any conditions detrimental to timely and proper completion of work. Work shall not proceed until satisfactory conditions are established.

F. The pipe to be filled shall be dewatered prior to selected fill placement. Dewatering will require pumping water and discharging to an existing sanitary facility.

G. Avoid freezing before the initial set of the selected material. Do not place mix in temperatures below 32 degrees F or when freezing temperatures are expected in less than 24 hours.

H. Use only the Engineer approved proportioning, mixing and pumping equipment. Mix the materials according to the mix design and convey promptly to the injection location. Avoid excessive handling of the LDCC or flowable fill.

I. LDCC shall have a minimum wet density of 30 pcf at the point of placement and a minimum 28-day compressive strength of 100 psi.

J. Flowable fill shall have a minimum wet-density of 90 pcf and a minimum 28-day compressive strength of 100 psi.

K. LDCC shall be field mixed thoroughly prior to injection. Install bulkheads, injection pipes, vent pipes, and valves as needed to inject the LDCC.

3.02 FIELD QUALITY CONTROL

A. Provide batch plant tickets for each truck delivery of flowable fill. Note on tickets addition of admixtures at site.

B. Check flow characteristics and workability of fill as placement proceeds.

C. Obtain at least three test cylinders for each 50 yards of material for determination of 56-day compressive strength and bleeding. Acceptance and placement will be based on average strength of three tests.

3.03 PROTECTION OF PERSONS AND PROPERTY

A. Provide safe working conditions for employees throughout demolition and removal operations. Observe safety requirements for work below grade.

B. Maintain safe access to adjacent property and buildings. Do not obstruct roadways, sidewalks or passageways adjacent to work.

END OF SECTION

SECTION 15200
Valves and Appurtenances

PART 1 – GENERAL

1.01 SCOPE

A. Furnish all labor, materials, equipment and incidentals required and install complete and ready for operation all valves and appurtenances as shown on the Drawings and as specified herein.

B. All valves complete with pneumatic or manual operators as required shall be furnished by a single manufacturer and shall be coordinated with instrumentation and controls.

1.02 RELATED WORK

A. Piping is included in Division 2.

1.03 DESCRIPTION OF SYSTEMS

A. All of the equipment and materials specified herein are intended to be standard for use in controlling the flow of water, sludge, chemicals, etc., depending on the applications.

1.04 QUALIFICATIONS

A. All of the types of valves and appurtenances shall be products of well established reputable firms who are fully experienced, reputable and qualified in the manufacture of the particular equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these specifications as applicable.

1.05 SUBMITTALS

A. Submit to the Engineer within 30 days after execution of the contract a list of materials to be furnished, the names of the suppliers and the date of delivery of materials to the site.

B. Complete shop drawings of all valves and appurtenances shall be submitted to the Engineer for approval in accordance with the requirements by Section 01300 and the General Conditions.

1.06 TOOLS

A. Special tools, if required for normal operation and maintenance shall be supplied with the equipment.

PART 2 - PRODUCTS

2.01 GENERAL

A. All valves and appurtenances shall be of the size shown on the drawings shall be from one manufacturer.

B. All valves and appurtenances shall have the name of the maker and the working pressure for which they are designed cast in raised letters upon some appropriate part of the body.

2.02 GATE VALVES: Not Used

2.03 CHECK VALVES

A. Check Valves shall be Surgebuster® Swing Check Valves suitable for cold working pressures of 250 psig in water, wastewater, abrasive, and slurry service. The check valve shall be of the full body type, with a domed access cover and only two moving parts, the flexible disc and the disc accelerator.

B. The valves shall be designed, manufactured and tested in accordance with American Water Works Association Standards ANSI/AWWA C508. Manufacturer shall have a quality management system that is certified to ISO 9000 by an accredited, certifying body.

C. Valves shall be provided with flanges in accordance with ANSI B16.1, Class 125.

D. The valve body shall be full flow equal to nominal pipe diameter at all points through the valve. The seating surface shall be on a 45 degree angle to minimize disc travel. A threaded port with pipe plug shall be provided on the bottom of the valve to allow for field installation of a backflow actuator, air cushion or hydraulic cushion without special tools or removing the valve from the line. The top access port shall be full size, allowing removal of the disc without removing the valve from the line. The access cover shall be domed in shape to provide flushing action over the disc for operating in lines containing high solids content. A threaded port with pipe plug shall be provided in the access cover to allow for field installation of a mechanical, disc position indicator.

E. The disc shall be of one-piece construction, precision molded with an integral o-ring type sealing surface, and contain alloy steel and nylon reinforcement in the flexible hinge area. The flex portion of the disc shall be warranted for twenty five years. Non-Slam closing characteristics shall be provided through a short 35 degree disc stroke and a disc accelerator to provide a cracking pressure of 0.3 psig. The disc accelerator shall be of one piece construction and provide rapid closure of the valve in high head applications. The disc accelerator shall be enclosed within the valve and shall be field adjustable and replaceable without removal of the valve from the line. The disc accelerator shall be securely held in place by being captured between the cover and disc. It shall be formed with a large radius to allow smooth movement over the disc surface.

F. The manufacturer shall demonstrate a minimum of five (5) years experience in the manufacture of resilient, flexible disc check valves with air and hydraulic cushions. All valves shall be hydrostatically tested and seat tested to demonstrate zero leakage. When requested the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals. The exterior and interior of the valve shall be coated with an ANSI/NSF 61 approved fusion bonded epoxy coating.

G. Surgebuster® Swing Check Valves shall be Series #7200 as manufactured by Val-Matic® Valve & Manufacturing Corporation, Elmhurst, IL. USA

2.04 PLUG VALVES

A. Plug valves shall be 100% Port Eccentric Plug Valves designed to meet the following standards:

- AWWA C517-05 Resilient-Seated Cast-Iron Eccentric Plug Valve
- ANSI flange drilled conforms to ANSI B16.1, Class 125 MJ joint end connections conform to ANSI/AWWA C11 1/A21.11.

B. Plug valve shall have a direct pressure, weatherproof nut actuator for buried use or chairwheel/chain where specified. Non-buried valves shall be handwheel or lever operated as space requires.

C. Interior and exterior of the valve shall be coated with an ANSI/NSF 61 approved two-part epoxy.

2.05 VALVE BOXES

A. All buried valves shall have cast iron two or three piece valve boxes with cast iron covers. Valve boxes shall be provided with suitable heavy bonnets and to extend to such elevation at or slightly above the finished

grade surface as directed by the Engineer. The barrel shall be one or two-piece, screw type, having 5-1/4-inch shaft. Covers shall have "WATER" cast into the top for all water mains and "DRAIN" cast into the top of all drain line. All valves shall have actuating nuts extended to within six inches of the top of valve box cover.

B. Valve boxes shall be provided with concrete base and valve nameplate with suitable anchors for casting in concrete. Nameplate shall be 3-inch diameter bronze disk with raised lettering 1/8-inch high as shown on the Drawings and manufactured by Shiedow Bronze Corporation, Kingwood, W. VA; or equal.

2.06 FLANGED ADAPTORS

A. Flanged adaptors where shown on the Drawings shall be "Uni-Flange" as manufactured by Uni-Flange Corporation, Series 400.

B. Flange shall be ductile iron designed to meet the requirements of ANSI D16. Set screw shall be AISI 4140 steel, heat treated, zinc

C. Where shown on the Drawings adaptor shall be harnessed.

2.07 FLEXIBLE COUPLINGS

A. Flexible couplings shall be either the split type or the sleeve Type as shown on The Drawings or needed to make connections as directed by the engineer.

1. Split type coupling shall be used with all interior piping and with exterior piping as noted on the Drawings. The couplings shall be mechanical type for radius groove piping. The couplings shall mechanically engage and lock grooved pipe ends in a positive couple and allow for angular deflection and contraction and expansion.

2. Couplings shall consist of malleable iron, ASTM Specification A47, Grade 32510 housing clamps in two or more parts, a single chlorinated butyl composition sealing gasket with a "C" shaped cross-section and internal sealing lips projecting diagonally inward, and two or more oval track head type bolts with hexagonal heavy nuts conforming to ASTM Specification A183 and A194 to assemble the housing clamps. Bolts and nuts shall be 316 Stainless Steel.

3. Victaulic type couplings and fittings may be used in lieu of flanged joints if approved by the Engineer. Pipes shall be radius grooved

as specified for use with the Victaulic couplings. Flanged adapter connections at fittings, valves, and equipment shall be Victaulic Vic Flange Style 741, equal by Gustin-Bacon Group, Division of Certain-Teed Products, Kansas City, Kansas, or equal.

4. Sleeve type couplings shall be used where shown on the Drawings. The couplings shall be of steel and shall be Dresser Style 38, Smith Blair Style 413, Baker Allsteel, or equal. The coupling shall be provided with 316 Stainless Steel bolts and nuts unless indicated otherwise.

5. All couplings shall be furnished with the pipe stop removed.

6. Couplings shall be provided with gaskets of a composition suitable for exposure to the liquid within the pipe.

7. If the Contractor decides to use victaulic couplings in lieu of flanged joints, he shall be responsible for supplying supports for the joints.

2.08 HOSE BIBBS

A. "Hose Bibs" shall be Post type, one inch, non freezing hydrant, suitable for 2' bury as manufactured by Zurn, Josam or equal. Bibs shall have a bronze casing, bronze interior parts and non-turning operation rod with free-floating compression closure valve. The bib shall be equipped with a tapped drain port in the valve housing and 18 inch long decorative cast aluminum shield around casing.

2.09 PRESSURE GAUGES

A. Pressure Gauges shall be installed on the discharge piping of all pumps proposed for this project. Each pressure gauge shall be direct mounted, polished stainless steel case with a 3--1/2-inch diameter dial and furnished with an acrylic plastic window, 1/4-inch shut-off valve, and be glycerin filled with bronze or stainless steel tube. All gauges shall be weatherproofed. The face dial shall be white finished aluminum with jet black graduations and figures. The face dial shall indicate the units of pressure being measured (e.g. feet, inches, etc.) or be dual scale. Socket material shall be bronze.

B. Pressure gauges shall be equal to Ashcroft Model 1009, or approved equal. Ranges shall be suitable to the application and will be as approved by the Engineer.

2.10 PIPE SLEEVE SEALS

A. A watertight seal at all wall sleeves shall be obtained using expandable rubber seal rings equal to Link-Seal as shown on the Drawings. These seal rings shall be the modular mechanical type consisting of synthetic rubber links shaped to continuously fill the annual space between the pipe and wall sleeve. Links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and nut. After the seal assembly is positioned in the sleeve, tightening of the bolts shall cause the rubber sealing sleeve. The watertight seal shall be effective against a hydrostatic head of at least 40 feet. The seal shall also be constructed so as to provide electrical insulation between the pipe and wall, thus reducing chances of cathodic reaction between these two members.

2.11 MAGNETIC FLOW METER

A. Magnetic flow meters provided for this project shall be non-intrusive electromagnetic flow meters providing calibrated accuracy of 0.03%..

B. Meter shall be provided with a hard rubber liner.

C. Meter shall be the Rosemont #8750W.

D. Primary flowhead shall have a housing rated for complete submergence (NEMA 6P).

2.12 ELECTRIC VALVE ACTUATORS FOR WASTEWATER: Not Used

2.13 PINCH VALVE: Not Used.

2.14 AIR VALVES

A. Wastewater Combination Air Valves shall be automatic float operated valves designed to exhaust large quantities of air during the filling of a piping system and close upon liquid entry. The valve shall open during draining or if a negative pressure occurs. The valve shall also release accumulated air from a piping system while the system is in operation and under pressure. The valve shall perform the functions of both Wastewater Air Release and Wastewater Air/Vacuum Valves and shall be furnished as a single body or dual body type as indicated on the plans.

B. Valves shall be manufactured and tested in accordance with American Water Works Association (AWWA) Standard C512.

C. Manufacturer shall have a quality management system that is certified to ISO 9001 by an accredited certifying body.

D. Connections

1. Single body valves sizes 4 in. and smaller shall have full size NPT inlets and outlets equal to the nominal valve size. The body inlet connections shall be hexagonal for a wrench connection. The body shall have 2" NPT cleanout and 1" NPT drain connection on the side of the casting.

2. Dual body valves sizes 4 in. through 6 in. shall have bolted flanged inlets and NPT outlets. 8 in. valves shall have flanged inlets and outlets. Flanges shall be in accordance with ANSI B16.1 for Class 125 iron flanges.

3. The valves shall have three additional NPT connections for the addition of backwash accessories.

E. Design

1. Both single and dual body valves shall provide an extended body with a through flow area equal to the nominal size. Floats shall be unconditionally guaranteed against failure including pressure surges. A resilient bumper shall be provided on 4 in. and larger sizes to cushion the float during sudden opening conditions. The seat shall provide drop tight shut off to the full valve pressure rating.

2. Dual body valves shall consist of a Wastewater Air Release Valve piped to a Wastewater Air/Vacuum Valve with full-ported brass ball valve.

    a. The Wastewater Air Release Valve shall have an extended leverage mechanism with sufficient mechanical advantage so that the valve will open under full operating pressure. An adjustable threaded resilient orifice button shall be used to seal the precision discharge orifice in the cover.

    b. The Wastewater Air/Vacuum Valve sizes 4" and larger shall have a cover fitted to the valve body by means of a machined register to maintain concentricity between the top and bottom guide bushings at all times. The tandem float assembly shall have a hexagonal guide shaft supported in the body by circular bushings to prevent binding from debris. The upper float shall be protected against direct water impact by an internal baffle. The seat shall be a minimum of 0.5 in. thick on 2 in. and larger valves and secured in such a manner as to prevent distortion.

3. Single body valves shall have a full port orifice, a double guided plug, and an adjustable threaded orifice button. The plug shall be protected against direct water impact by an internal baffle and an extended float stem. The plug shall have a precision orifice drilled through the center stem. The float shall include a sensitivity skirt to minimize spillage.

4. Dual body valves 8 in. in size shall have the outlets to both the air release valve and the air vacuum valve piped to the exterior of the manhole as indicated in the plans.

F. Materials

1. The valve body and cover shall be constructed of ASTM A351 Grade CF8M stainless steel.

2. The float, plug, guide shafts, and bushings shall be constructed of Type 316 stainless steel. Non-metallic guides and bushings are not acceptable. Resilient seats shall be Buna-N.

3. Piping 8 in. and larger that is used to vent the air vacuum valve to the exterior of the manhole shall be flanged ductile iron pipe with a Protecto 401 lining and coating. 1 in. piping used to vent the valve to the exterior of the manhole shall be type M copper.

G. Manufacturer

1. The manufacturer shall demonstrate a minimum of (5) years experience in the manufacture of wastewater air valves. The valves shall be manufactured and tested in accordance with AWWA C512. When requested, the manufacturer shall provide test certificates, dimensional drawings, parts list drawings, and operation and maintenance manuals.
2. The exterior of the valve shall be coated with a universal alkyd primer.

3. Wastewater Combination Air Valves shall be Series 800 (single body) or Series 49A/300 (dual body) as manufactured by Val-Matic Valve and Manufacturing Corporation, Elmhurst, II, USA or approved equal.

2.15 HATCHES

A. Hatches shall be reinforced for 300 pounds per square foot loading. Cover shall be ¼" aluminum diamond plate cover equipped with cast aluminum flush lifting handle and 316 stainless steel hold-open arm with red vinyl grip that automatically keeps the cover in its open/upright position. Manufacturer shall guarantee against defects in materials and

workmanship for a period of ten years. Round Hatches for installation on air release valve manholes shall be model RPS as manufactured by USF Fabrication, Inc. Hatches for Valve Vaults and Metering Pits shall be 2-door custom vault covers by Placer Waterworks, Inc. Miscellaneous hatches used on other concrete structures shall be as specified in the Plans.

PART 3 - EXECUTION

3.01 INSTALLATION

A. All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the Engineer before they are installed.

B. After installation, all valves and appurtenances shall be tested at least 2 hours at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any point proves to be defective, it shall be repaired to the satisfaction of the Engineer.

C. Install all floor boxes, brackets, extension rods, guides, the various types of operators and appurtenances as shown on the Drawings that are in masonry floors or walls, and install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the Contractor shall check all plans and figures which have a direct bearing on their location and he shall be responsible for the proper location of these valves and appurtenances during the construction of the structures.

D. Pipe for use with flexible couplings shall have plain ends as specified in the respective pipe sections in Division 15.

E. Flanged and mechanical joints under water or exposed to weather shall be made with type 304 stainless steel bolts, nuts and washers.

F. Prior to assembly of split couplings, the grooves as well as other parts shall be thoroughly cleaned. The ends of the pipes and outside of the gaskets shall be moderately coated with petroleum jelly, cup grease, soft soap or graphite paste, and the gasket shall be slipped over one pipe end. After the other pipe has been brought to the correct position, the gasket shall be centered properly over the pipe ends with the lips against the pipes. The housing sections then shall be placed. After the bolts have been inserted, the nuts shall be tightened until the housing sections are firmly in contact, metal-to-metal, without excessive bolt tension.

G. Prior to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly for a distance of 8 inches. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6 inches from the end, and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid. The gaskets and followers shall then be pressed evenly and firmly into the middle ring flares. After the bolts have been inserted and all nuts have been made up finger tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts.

H. Pressure gauges shall not be installed until after the substantial completion date unless otherwise requested by the Owner.

I. Valve boxes with concrete bases shall be installed as shown on the Drawings. Mechanical joints shall be made in the standard manner. Valve stems shall be vertical in all cases. Place cast iron box over each stem with base bearing on compacted fill and top flush with final grade. Boxes shall have sufficient bracing to maintain alignment during backfilling. Knobs on cover shall be parallel to pipe. Remove any sand or undesirable fill from valve box.

3.02 SHOP PAINTING

A. Ferrous surfaces of valves and appurtenances shall receive an exterior coating of rust-inhibitive primer as specified in Section 09900. Interior coatings shall be the manufacturer's standard except that valves on raw and potable water lines shall be coated with paints approved by both EPA and AWWA for potable water service. All pipe connection openings shall be capped after shop painting to prevent the entry of foreign matter prior to installation.

3.03 FIELD PAINTING

A. All metal valves and appurtenances specified herein and exposed to view will be painted as part of the work in Section 09900. All exposed pipe joints on pipe, valves and fittings shall be caulked 360 degrees prior to painting.

3.04 INSPECTION AND TESTING

A. Completed pipe shall be subjected to hydrostatic pressure tests for four (4) hours at full working pressure. All leaks shall be repaired and lines retested as approved by the Engineer. Prior to testing, the gravity pipelines shall be supported in an approved manner to prevent movement during tests.

END OF SECTION