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SECTION 00100
Instructions to Bidders

1.01 CONTRACT DOCUMENTS

A. The Contract Documents include the Contract Agreement, Invitation to Bid, Instructions to Bidders, Contractor's Bid (including all documentation accompanying the Bid and any post-Bid documentation required by the Owner prior to the Notice of Award), Bonds, all Special Conditions, General Conditions, Supplementary Conditions, Specifications, Drawings, and addenda, together with written amendments, change orders, field orders and the PM/CM's written interpretations and clarifications issued in accordance with the General Conditions on or after the date of the Contract Agreement.

B. Shop drawing submittals reviewed in accordance with the General Conditions, geotechnical investigations and soils reports, and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site, are not Contract Documents.

C. The Contract Documents shall define and describe the complete work to which they relate.

1.02 DEFINITIONS

A. Where the following words or the pronouns used in their stead occur herein, they shall have the following meaning:

1. "Owner" shall mean Rockdale County, Georgia, party of the first part to the Contract Agreement, or its authorized and legal representatives.

2. "Program Manager/Construction Manager" shall mean Rockdale Water Resources-Engineering Dept., hereinafter also designated as "PM/CM".

3. "Designer" shall mean Rockdale Water Resources(RWR).

4. "Contractor" shall mean the party of the second part to the Contract Agreement or the authorized and legal representative of such party.

5. "Work" and "Project" shall mean the entire completed construction required to be furnished under the Contract Documents.

6. "Contract Time" shall mean consecutive calendar days as provided in the Contract Document for completion of the Project, to be computed from the date of the Notice to Proceed.

7. "Liquidated Damages" shall mean the sum of $100.00 which the Bidder agrees to pay for each consecutive calendar day beyond the Contract Time required to complete the Project. Liquidated Damages will end upon written notification from the Owner of final acceptance of the Project.

8. "Products" shall mean materials or equipment permanently incorporated into the Project.

9. "Provide" shall mean to furnish and install.

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

11. "Substantial completion of the work", solely for the purposes of Official Code of Georgia Annotated (O.C.G.A.) §13-10-20(c), shall be defined as occurring on the date of the written notification from the PM/CM that the Project is ready for final inspection, as specified in Section 00800, Article 30, paragraph (g).

12. "Satisfactorily completed", solely for the purposes of O.C.G.A. §13-10-20(b), shall mean the completion of all work, certifications and affidavits as specified in Section 00800, Article 30, paragraph (g).

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.

B. Each Bid must be submitted on the Bid forms which are included in this Invitation to Bid. All blank spaces for Bid prices, both words and figures, must be filled in, in ink. In case of discrepancy, the amount shown in words will govern. All required enclosed certifications must be fully completed and executed when submitted.

C. The Bidder shall provide on the outside of the sealed envelope the following information; otherwise the Bid will not be opened and will be returned to the Bidder(refer to Invitation to Bid(ITB) instructions at the beginning of this document for bid submittal information):

1. Bidder's Name

2. Georgia Utility Contractor License Number

3. BID #23-04 Ga HWY 138 SEWER MAIN EXTENSION

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

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

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

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

3. Bids which are signed for a corporation shall have the correct corporate name thereof and the signature of the president or other authorized officer of the corporation manually written below the corporate name following the wording "By_____". Corporation seal shall also be affixed to the Bid.

4. The Bidder shall complete, execute and submit the following documents, which are attached to these Contract Documents:

a. Bid Form

b. The Bid Bond
c. Corporate Certificate, if the Bidder is a corporation
d. Non-Collusion Affidavit of Prime Bidder
e. Non-Collusion Affidavit of Sub-Contractor
f. Contractor's Affidavit
g. Sub-Contractor's Affidavit
h. Affidavit Verifying Status for County Public Benefit Application
i. Contractor's License Certification
j. Contractor Qualification Statement and Questionnaire

1.04 METHOD OF BIDDING

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

1.05 ADDENDA AND INTERPRETATIONS

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

B. Refer to "**QUESTIONS AND CLARIFICATIONS**" section above for information on submitting questions.

C. Any and all such interpretations and any supplemental instructions will be in the form of written Addenda to the Contract Documents which, if issued, will be posted on Rockdale County's website www.rockdalecountyga.gov, Bids, RFPs and Announcements/Current Bids. Any discussions or documents will be considered non-binding unless incorporated and issued in an addendum.

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

1.06 BID SECURITY

A. Each Bid must be accompanied by a Bid Bond, prepared on the form of Bid Bond included herein or a Surety Company's Standard Bid Bond, duly executed by the Bidder as principal and having as surety thereon a surety company authorized to do business in the State of Georgia and listed in the latest issue of U.S. Treasury Circular 570, in the amount of 5 percent of the Bid. Attorneys-in-fact who sign Bonds must file with each Bond a currently dated copy of their power of attorney.

B. If for any reason whatsoever the successful Bidder withdraws from the competition after opening of the Bids, or if Bidder refuses to execute and deliver the Contract and Bonds required within 10 days after receipt of notice of the acceptance of Bid, the Owner may proceed to enforce the provisions of the Bid Bond.

1.07 RECEIPT AND OPENING OF BIDS

The Owner may consider a minor irregularity any Bid not prepared and submitted in accordance with the provisions hereof and may waive any minor irregularities or reject any and all Bids. Any Bid may be withdrawn prior to the 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.

1.08 SUBCONTRACTS

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

1.9 CONDITIONS OF THE PROJECT

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

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

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

1.10 NOTICE OF SPECIAL CONDITIONS

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

1.11 OBLIGATION OF BIDDER

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

1.12 METHOD OF AWARD

A. The contract will be awarded to the responsive, responsible Bidder submitting the Bid which is in the best interest of the Owner as determined by the Owner.

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

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

D. Acceptance of the Bidder's documentation and substantiation or Contract Award by the Owner does not relieve the Bidder of liability for non-performance as covered in the Contract Documents, nor will the Bidder be exempted from any other legal recourse the Owner may elect to pursue.

END OF SECTION

SECTION 00422
Corporate Certificate

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

This_____day of_____, 2017.

(Corporate Secretary) _

(SEAL)

END OF SECTION

SECTION 00425
Contractor's License Certification

Contractor's Name: _____

Georgia Utility 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 00500

AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

00500 - SAMPLE CONTRACT

AGREEMENT FOR THE CONSTRUCTION OF THE

FIELDSTONE PUMP STATION ELIMINATION

This Agreement entered into on this_____day of 2021, between ROCKDALE COUNTY, GEORGIA, a political subdivision of the State of Georgia, whose address is 962 Milstead Avenue, Conyers, Georgia 30012, (hereinafter referred to as the "County") and (CONTRACTOR'S NAME], a [DESCRIPTION OF CONTRACTOR'S BUSINESS TYPE], whose address is [CONTRACTOR'S ADDRESS] (hereinafter referred to as "Contractor").

WHEREAS, the County desires to engage the services of Contractor for the construction of the FIELDSTONE PUMP STATION ELIMINATION; and

WHEREAS, Contractor is qualified to perform this service and desires to render this service to the County as provided herein.

NOW THEREFORE, the County engages the services of Contractor for and in consideration of the mutual promises contained in this Agreement and the parties agree as follows:

1. **Services Provided by Contractor.**
The Contractor will furnish all products, tools, construction equipment, skill and labor of every description necessary to carry out and to complete in a good, firm, substantial workmanlike manner the construction of the [PROJECT NAME] as described in the County's Invitation to Bid (ITB) [ITB#] incorporated herein by reference, (hereinafter called "Work"), and Contractor's bid dated [DATE], attached hereto and made a part hereof (hereinafter called "Bid"). Contractor shall provide, at their expense, all vehicles and equipment necessary to provide this Work. The Work shall be performed at the direction of the Stormwater Utility's General Engineering Manager or their designee and consistent with all Federal, State and local laws.

The Contract Documents, Bid Documents, Invitation to Bid, and drawings are considered essential parts of the Agreement, and requirements occurring in one are as binding as though occurring in all. They are intended to define, describe and provide for all labor necessary to complete the Work in an acceptable manner, ready for use, or operation by the County.

2. **Fees and Compensation.**

(a) Contract Price: The Contract Price shall not exceed [CONTRACT AMOUNT], and shall be the total amount payable by the County to the Contractor for the performance of the Work set forth in the Contract Documents, unless amended as agreed upon by both parties in writing as detailed in Section 6 of this Agreement. The County shall provide payment within _____ (__) days of receiving said invoice.

It is understood that the Contractor shall provide and pay for all products, labor (including labor performed after regular working hours, on Saturdays or Sundays, or on legal holidays), tools, construction equipment, supervision, and all

other services and facilities of any nature whatsoever necessary to execute, complete, place into operation, and deliver the Work.

The Contractor shall be responsible for any additional expenses incurred by the County as a result of the extended work hours, including resident inspection overtime. The cost associated with resident inspector overtime will be deducted from the Contractor's monthly payment request.

(b) Payments Withheld: The County may decline to approve an application for payment, in whole or in part, as may be necessary to protect the County from loss because of:

(I) Failure of the Contractor to make payments properly to subcontractors or for labor or products.

(2) Unsatisfactory prosecution of the Work by the Contractor either due to quality of the Work or if the Contractor is behind the currently approved construction schedule.

When the above reasons for nonpayment are corrected, then payment will be made for amounts withheld because of such reasons, not later than the next payment.

(c) Retention: The County will retain the following amounts from each properly certified estimate:

(I) Until the value of the Work completed, including stored materials, is at least 50 percent of the Contract amount, 10 percent of the value of all Work satisfactorily completed, including stored materials.

(2) When the value of the completed Work totals at least 50 percent of the Contract amount, the County will reduce the retainage to 5 percent of the value of Work completed, including stored materials provided the Work is progressing satisfactorily and there is no specific cause for retaining a larger sum. The total amount retained will be at least 5 percent of the Contract amount, adjusted for Change Orders, until the date of final payment.

(3) The County may elect to reinstate retention of 10 percent of the value of the Work completed if at any time the Contractor fails to make satisfactory progress or if there is other specific cause. No form of collateral in lieu of cash will be acceptable as retainage.

Amounts retained by the Contractor from payments due to suppliers and subcontractors (expressed as a percentage) shall not exceed that being retained by the County.

3. Effective Dates of Agreement.

The effective date of this Agreement shall be the date said Agreement is signed by the Chairman of the Rockdale County Board of Commissioners (the "Board"). The terms of this Agreement shall be _____(__) months from the effective date, unless terminated by either party as detailed in section 13 of this Agreement.

The Contractor shall begin the Work no later than thirty (30) days after issuance of the Notice to Proceed, and shall complete the Work no later than _____ (___) days after issuance of the Notice to Proceed, unless a time extension is authorized in writing by the Project Manager.

Time is of the essence and is an essential element of this Contract, and the Contractor shall pay to the County, not as a penalty, but as liquidated damages, the sum of $_____ for each calendar day that there is default of completing the Work within the time limit named herein. If the Contractor abandons the Contract before commencement of the Work or defaults in completion of all the Work after commencement thereof, the Contractor shall be liable for such liquidated damages. These fixed liquidated damages are not established as a penalty but are calculated and agreed upon in advance by the County and the Contractor due to the uncertainty and impossibility of making a determination as to the actual and consequential damages incurred by the County and the general public of Rockdale 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.

4. **Rejection of Work and Materials.**
All products furnished and all Work completed will be inspected by the County. All products furnished and all Work completed that is not in accordance with the Contract Documents or that is defective will be rejected. All rejected products or Work shall be removed immediately. If rejected products or Work is not removed within 48 hours, the County will have the right and authority to stop the Work immediately and will have the right to arrange for the removal of said rejected products or Work at the cost and expense of the Contractor.

5. **Supervision of Work.**
The Contractor shall supervise and direct the Work. The Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures of the **Work.** The Contractor shall employ and maintain on the Work a qualified supervisor or superintendent who shall be designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the Work.

The supervisor shall have full authority to act on behalf of the Contractor and to execute the orders or directions of the County without delay. The supervisor shall have full authority to promptly supply products, tools, plant equipment and labor as may be required. The supervisor's authority shall be such that all communication given to the supervisor shall be as binding as if given to the Contractor.

The Contractor shall employ only competent and skilled personnel. The Contractor shall, upon demand from the County, immediately remove any superintendent, foreman or workman whom the County may consider incompetent or undesirable.

6. **Changes in the Contract.**
The County may at any time, as the need arises, order changes within the scope of the Work without invalidating the Contract Agreement. If such changes increase or decrease the amount due under the Contract Documents, or in the time required for performance of the Work, an equitable adjustment will be authorized by Change Order.

7. **Insurance.**
The Contractor shall not commence any work under this Contract until all insurance, as stipulated in the Invitation to Bid, has been obtained and such insurance has been approved by the County, nor shall the Contractor allow any subcontractor to commence any work on subcontractor's contract until all similar insurance required of the subcontractor has been so obtained and approved by the Contractor.

8. **Interruption of Facility Operations.**
The Contractor shall provide the County with written notice at least three days prior to any interruption in facility operations required by 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, a complete identification of all those processes, equipment and operations to be affected and all other information the County may require. The Contractor shall provide any equipment, piping, auxiliary power or other means necessary to sustain facility operations.

9. Protection of Work, Property and Persons.

(a) 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 the 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 *or* adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

(b) The Contractor shall comply with the Department of Labor Safety and Health Regulations for construction, promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section l 07 of the Contract Work Hours and Safety Standards Act (PL 91-54) as amended. The Contractor shall erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection.

(c) 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 any 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 make good such damages or injury, the County 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 the Contractor under this Contract.

(d) In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the County, shall act to prevent threatened damage, injury or loss.

(e) Completed Work and stored products shall be suitably protected during unseasonable weather, to allow Work to proceed in a timely fashion. Work planned, or in progress, should be performed to minimize impact of adverse weather.

10. Protection of the Environment.

(a) 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. This shall include but not be limited to air, water & noise pollution during torch cutting, grinding, burning and grading operations.

(b) 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.

(c) The Contractor is responsible for maintenance of all erosion control measures, final removal of all temporary BMP's, and irrigation of all permanent vegetative measures until fully established.

11. **Protection, Location and Relocation of Utilities.**

The Contractor shall notify utility owners of the new work in accordance with Georgia Law by calling the Utilities Protection Center (UPC) at 800-282-7411, 72 hours before work is to begin. 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 failure to exercise reasonable care in the performance of Work. If the Contractor fails or refuses to repair any such damage promptly, the County may have the Work performed and charge the cost thereof to the Contractor.

Prior to the construction or installation of any new Work, the Contractor shall excavate all existing utilities within the vicinity of the Work to their actual vertical and horizontal location. In order to avoid conflicts between existing and new Work, the Contractor shall either relocate the existing utility on a temporary or permanent basis, or shall take whatever means necessary to protect the existing facilities or utilities during the installation of new Work.

12. **Indemnification.**

In addition to its agreement to obtain and maintain insurance as set forth herein, the Contractor agrees to indemnify and hold harmless the County, its officers, agents, and employees, from any and all claims against the County, its officers, agents and employees, which arise out of any act or omission of the Contractor or any of the Contractor's officers, agents and/or employees, and any and all claims which result from any condition created or maintained by the Contractor or anyone employed by the Contractor or any of their officers, agents or employees, which condition does not specify to be created or maintained by this Contract.

13. **Termination of Agreement.**

In the event either party elects to terminate this Agreement for whatever reason deemed appropriate, written notice shall be provided and termination shall be effective 15 days from receipt of written no tice.

14. **Notice.**

Any notice or other communication required or permitted to be given under this Agreement must be in writing and must be mailed by overnight delivery or certified mail, postage prepaid, so that the notifying party can prove delivery of notice and the date thereof, and addressed as follows:

To the County:	To the Contractor:
Rockdale County, Georgia	[COMPANY NAME]
Stormwater Utility	Attn: [REPRESENTATIVE]
Attn: [PROJECT MANAGER]	[ADDRESS I]
P.O. Box 1495	[ADDRESS 2]
Conyers, Georgia 30012	[CITY, STATE, ZIP CODE]

The addresses stated in this paragraph may be changed by the respective parties upon a documented notice delivered in advance, pursuant to this paragraph.

15. **Assignment.**

The Contractor shall have no right to transfer or assign its interest in this Agreement without the prior written consent of an authorized representative of the County.

16. **Corporate Authority.**
Contractor represents to the County that this Agreement, the transaction contemplated in this Agreement, and the execution and delivery hereof, have been duly authorized by all necessary corporate proceedings and actions, including, without limitation, the action on the part of the directors. The individual executing this Agreement on behalf of Contractor warrants that he or she is authorized to do so and that this Agreement constitutes the legally binding obligation of the corporation.

17. **Waiver.**
No action taken pursuant to this Agreement shall be deemed to constitute a waiver by the party taking such action of compliance with any representation, warranty, covenant or agreement in this Agreement. The waiver by any party of a breach of any provision or condition contained in this Agreement shall not operate or be construed as a waiver of any subsequent breach or of any other conditions.

18. **Severability.**
If any provision of this Agreement or application to any party or circumstances shall be determined by any court of competent jurisdiction to be unenforceable to any extent, the remainder of this Agreement or the application of such provision to such person or circumstances, other than those as to which it is so determined invalid or unenforceable, shall not be affected thereby, and each provision hereof shall be valid and shall be enforced to the fullest extent permitted by law.

19. **Interpretation.**
Should any provision of this Agreement require a judicial interpretation, the parties agree that the body interpreting or construing this Agreement will not apply the assumption that the terms of this Agreement will be more strictly construed against one party by reason of the rule of legal construction that an instrument is to be construed more strictly against the party which itself or through its agents prepared the Agreement. The parties acknowledge and agree that they and their agents have each participated equally in the negotiation and preparation of this Agreement.

20. **Venue & Jurisdiction.**
The County and the Contractor, by entering into this Promissory Note, hereby agree that the courts of Rockdale County, Georgia shall have jurisdiction to hear and determine any claims or disputes between them pertaining directly or indirectly to this Agreement. Contractor expressly submits and consents in advance to such jurisdiction in any action or proceeding commenced in said courts. The choice of forum set forth in this section shall not be deemed to preclude the bringing of any action by the County or the enforcement by the County of any judgment obtained in such forum in any other appropriate jurisdiction. Further, the Contractor hereby waives the right to assert the defense of forum non-convenient and the right to challenge the venue of any court proceeding.

21. **Governing Law.**
This Agreement shall be construed and interpreted according to the provisions of the laws of the State of Georgia.

22. **Binding Effect.**
This Agreement shall be binding upon the Contractor and its successors and permitted assigns.

23. **Further Assurances.**
The Contractor agrees to execute, acknowledge, seal and deliver, after the date of this Agreement, without additional consideration, such further assurances, instruments and documents, and to take such further actions, as the County may reasonably request in order to fulfill the intent of this Agreement and the transactions contemplated by this Agreement.

24. **Entire Agreement.**

This Agreement, its attachments and essential documents (as provided in1 I above) represent the entire understanding of the parties with regard to the subject matter of this Agreement. There are no oral agreements, understandings, or representations made by any party to this Agreement that are outside of this Agreement and are not expressly stated in it. No supplement, modification, or amendment of this Agreement will be binding unless executed in writing by all parties.

By signing this Agreement, the parties acknowledge that they have read each and every page of this Agreement before signing same and that they understand and assent to all the terms thereof. In addition, by signing this Agreement, the parties acknowledge that they are entering into this Agreement freely and voluntarily and under no compulsion or duress.

IN WITNESS WHEREOF, the parties have hereunto set their hands and seals on the date and year first above written.

[CONTRACTOR'S NAME]

By:_____

Witness:

By:_____

ROCKDALE COUNTY, GEORGIA
BOARD OF COMMISSIONERS

By:_____
Oz Nesbitt, Sr., Chairman

Attest:

By:_____
Jennifer Rutledge, County Clerk

Approved as to Form:

By:_____
M Qader A. Baig, County Attorney

SECTION 00700
General Conditions

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GENERAL: The provisions of these General Conditions are intended, but are not limited to, providing general conditions of agreement and provisions toward the awarding of the Contract, the obligations of the successful Bidder and requirements for execution and administration of the Contract. IN ANY EVENT, PROVISIONS IN THIS SECTION ARE SUBJECT TO AND GOVERNED BY PROVISIONS IN THE SUPPLEMENTARY CONDITIONS, AS APPLICABLE.

ARTICLE 1 - NOTICE OF AWARD OF CONTRACT

After receipt of Bids, the Owner shall notify the successful Bidder of the award of the Contract as stipulated in the Supplementary Conditions.

ARTICLE 2 - EXECUTION OF CONTRACT DOCUMENTS

Within 10 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.

Within 10 days after receipt, the Contractor shall return all the Documents properly executed by the Contractor and the surety. Attached to each Document shall be an original power-of-attorney for the person executing the Bonds for the surety and certificates of insurance for the required insurance coverage.

Within 30 days after receipt of the conformed Documents executed by the Contractor and the surety with the power-of-attorney and certificates of insurance, the Owner will complete the execution of the Documents. Distribution of the completed Documents will be made upon execution by the Owner.

Should the Contractor and/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.

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.

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.

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, the Performance Bond conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions and agreements of the Contract Documents, and the Payment Bond conditioned upon the prompt payment by the Contractor to all persons supplying labor and products in the prosecution of the Work provided by the Contract Documents. Such Bonds shall be executed by the Contractor and a corporate bonding company licensed to transact such business in the State where the Project is located and named on the current

list of "Surety Companies Acceptable 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 or loses its right to do business in the State where the Project is located or is removed from the list of Surety Companies accepted on Federal Bonds, the Contractor shall, within 10 days after notice from the Owner to do so, substitute an acceptable Bond (or Bonds) in such form and sum and signed by such other surety as may be satisfactory to the Owner. The premium on such Bond (or Bonds) shall be paid by the Contractor. No further progress payments shall be deemed due, nor shall be made, until the new surety furnishes an acceptable Bond to the Owner.

The person executing the Bond on behalf of the surety shall file with the Bond a general power of attorney, unlimited as to amount and type of Bond covered by such power of attorney and certified to by an official of said surety.

ARTICLE 4 - INSURANCE

The Contractor shall not commence any work under this Contract until all insurance, as stipulated in the Supplementary Conditions, has been obtained and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence any work on subcontractor's contract until all similar insurance required of the subcontractor has been so obtained and approved by the Contractor.

ARTICLE 5 - INDEMNIFICATION

The Contractor shall indemnify and hold harmless the Owner, the PM/CM, the Designer and their agents and employees from and against all claims, damages, losses and expenses including claims consultants' and attorneys' fees arising out of or resulting from the performance of the Work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including the loss of use resulting thereof; and is caused in whole or in part by willful act or omission 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.

In any and all claims against the Owner, the PM/CM, the Designer, 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, the 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 worker's compensation acts, disability benefit acts or other employee benefits acts.

This indemnification and hold harmless obligation shall extend to cover any and all claims not covered by the Owner's Protective Liability Insurance, the requirements of which are specified in Article 4 of the Supplementary Conditions.

ARTICLE 6 - NOTICE TO PROCEED

The Notice to Proceed will be issued, following the pre-construction conference, within 10 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 10 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.

ARTICLE 7 - TERMINATION OF WORK FOR DEFAULT

(a) The Work may be terminated if:

(1) The Contractor is adjudged bankrupt or 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 repeatedly 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 repeatedly 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 PM/CM.

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

(b) The Owner may, without prejudice to any other right or remedy and after giving the Contractor and surety a minimum of 10 days from delivery of a written notice, terminate the services of the Contractor and take possession of the Project 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, including compensation for additional professional services, such excess shall be paid to the

Contractor. If such costs exceed such unpaid balance, the Contractor and/or surety shall pay the difference to the Owner. Such costs incurred by the Owner will be determined bythe PM/CM and incorporated in a Change Order.

(c) 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 THE OWNER

If, for any reason other than those provided for under Article 7, the Owner elects to discontinue, in whole or part, the Work under this Contract, the Owner may, after 10 days from delivery of a written notice to the Contractor and the PM/CM, 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.

In the event of such termination by the Owner, the Contractor shall be entitled to payment for the Work at the jobsite acceptably performed up to the time of the termination and reimbursement for such 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 shjll be limited to 6 percent of such amounts. The Contractor will not be entitled to any payment, including any anticipated profit, on Work not performed and will not be entitled to any compensation for other economic loss arising out of or resulting from such compensation 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 written consent of the Owner. In case the Contractor assigns 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 the assignee in and to any monies due or to become due to the Contractor shall be subject 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 – SUBCONTRACTING

(a) The Contractor shall not subcontract the complete Work, or any part thereof, and shall not award any work to any subcontractor without prior written approval of the Owner. Owner approval will not be given except upon the basis of written statements containing such information as the Owner may require. At the pre-construction conference, the Contractor shall submit all subcontractors that the Contractor plans to use on the Project. Any changes or additional subcontractors should be submitted at least 14 days prior to the needed approval.

(b) The Contractor shall utilize the services of specialty subcontractors on those parts of the Work which, under normal contracting practices, are best performed by specialty subcontractors, as required by the Owner in the Owner's sole discretion, at no additional cost to the Owner.

If the Contractor desires to perform specialty work, the Contractor shall submit a request to the Owner, accompanied by evidence that the Contractor's own organization has successfully performed the type of work in question, is presently competent to perform the type of work, and the performance of the work by specialty subcontractors will result in materially increased costs or inordinate delays.

(c) The Contractor shall be fully responsible to the Owner for the acts and omissions of the Contractor's subcontractors and of persons either directly or indirectly employed by the Contractor. The Contractor shall be fully responsible to the Owner for the acts and omissions of independent contractors or independent subcontractors of the Contractor and of persons indirectly employed by the Contractor as the Contractor is for the acts and omissions of persons directly employed by the Contractor.

(d) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind subcontractors to the Contractor by the terms of the General Conditions and other Contract Documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the Contract Documents.

(e) Nothing contained in this Contract shall create any contractual relation between any subcontractor and the Owner.

ARTICLE 11 - AUTHORITY OF THE PM/CM

The PM/CM will act as the Owner's representative during the construction period. The Owner will decide questions which may arise as to quality and acceptability of products furnished and Work performed. The Owner will interpret the intent of the Contract Documents in a fair and unbiased manner. The PM/CM will make visits to the site and determine if the Work is proceeding in accordance with the Contract Documents. The PM/CM will judge as to the accuracy of quantities submitted by the Contractor in partial payment estimates which these quantities represent. The decisions of the PM/CM will be final and conclusive.

ARTICLE 12 - SEPARATE CONTRACTS

(a) The Owner reserves the right to let other contracts in connection with 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 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 PM/CM any defects in such work that render it unsuitable for such proper execution and results.

(b) 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 work, and shall properly connect and coordinate Contractor's work with work performed by Owner's own forces.

(c) 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 involves the Contractor in 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.

ARTICLE 13 - LAWS AND REGULATIONS

The Contractor's attention is directed to the fact that all applicable federal, state, county and city laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout, and they will be deemed to be included in 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 materials 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. 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 PM/CM, the Designer 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.

ARTICLE 14 - TAXES

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.

ARTICLE 15 - NOTICE AND SERVICE THEREOF

(a) All notices, demands, requests, instructions, approvals, and claims shall be in writing.

(b) 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) All papers required to be delivered to the Owner shall be delivered as stipulated in the Supplementary Conditions.

(d) Any such notice or demand shall be deemed to have been given to the Owner or made as of the time of actual delivery to Owner.

ARTICLE 16 - PATENTS

(a) The Contractor shall hold and save the Owner, the PM/CM, the Designer and their agents harmless from liability of any kind, including cost and expenses, reasonable attorney's fees, for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Work, including its use by the Owner.

(b) If the Contractor uses any design, process, device or materials covered by letters, trademarks, patent or copyright, the Contractor shall provide for such use by suitable agreement between the Owner and the holder of such patented 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. The Contractor and the Contractor's sureties shall indemnify and save harmless the Owner, the PM/CM, the Designer and their agents from claims for infringement by reason of the use of such patented or copyrighted design, process, device or materials or any trademark or copyright in connection with Work agreed to be performed under this Contract, and shall indemnify the Owner, the PM/CM, the Designer and their agents for any cost, expense, damage and reasonable attorney's fees which it 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

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 done, rights-of-way for access thereto, and such other lands which are designated for the use of the Contractor. The Contractor shall confine 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.

If, due to some unforeseen reason, the necessary easements are not obtained, the Contractor shall receive an equitable extension of Contract Time and/or an equitable increase in the Contract Price to cover the Contractor's additional costs as a result thereof, provided the Owner is notified immediately of the claim. The Contractor's claim therefor shall be handled as provided for under Article 29.

Should additional temporary easements for ingress or egress be required by the Contractor for more suitable access to the Work, these easements shall be obtained by the Contractor, at no additional cost to the Owner.

Additional requirements shall be as stipulated in the Supplementary Conditions.

ARTICLE 18 - PRODUCTS

(a) Products shall be so 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.

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

(c) Products shall be furnished in accordance with shop drawings and/or samples submitted by the Contractor and approved by the Designer.

(d) Products to be incorporated into the Work shall not be purchased by the Contractor or the 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

The Contractor shall supervise and direct the Work. The Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor shall employ and maintain on the Work a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the Work.

The supervisor shall have full authority to act on behalf of the Contractor and to execute the orders or directions of the PM/CM without delay. The supervisor shall have full authority to promptly supply products, tools, plant equipment and labor as may be required. The supervisor's authority shall be such that all communication given to the supervisor shall be as binding as if given to the Contractor.

The Contractor shall employ only competent and skilled personnel. The Contractor shall, upon demand from the PM/CM, immediately remove any superintendent, foreman or workman whom the PM/CM or Owner may consider incompetent or undesirable.

ARTICLE 20 - INTERRUPTION OF FACILITY OPERATIONS

The Contractor shall provide the Owner with written notice at least five days prior to any interruption in facility operations required by 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 equipment, piping, auxiliary power or other means necessary to sustain facility operations or function for interruptions which have not been identified by the Specifications, or when interruptions must exceed the time allowed by the Specifications.

Additional requirements, if any, shall be as stipulated in the Supplementary Conditions.

ARTICLE 21 - PROTECTION OF WORK, PROPERTY AND PERSONS

(a) 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 the 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 or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

(b) The Contractor shall comply with the Department of Labor Safety and Health Regulations for construction, promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54). The Contractor shall erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection.

(c) 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 any 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 make good 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 the Contractor under this Contract.

(d) In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the PM/CM or Owner, shall act to prevent threatened damage, injury or loss.

(e) Completed Work and stored products shall be suitably protected during unseasonable weather, to allow Work to proceed in a timely fashion. Work planned, or in progress, should be performed to minimize impact of adverse weather.

ARTICLE 22 - PROTECTION OF THE ENVIRONMENT

(a) 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) 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

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 failure to exercise reasonable care in the performance of 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.

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 Owner. No separate 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

The Contractor shall submit to the Owner progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed as stipulated in the Supplementary Conditions.

ARTICLE 25 - DRAWINGS AND SPECIFICATIONS

The Drawings, Specifications, Contract Documents, and all supplemental documents, are considered essential parts of the Contract, and requirements occurring in one are as binding as though occurring in all. 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.

The PM/CM will furnish the Contractor five 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.

In case of conflict between the Drawings and Specifications, the Specifications will govern. Figure dimensions on Drawings will govern over scale dimensions, and detailed Drawings will govern over general Drawings.

In cases where products or quantities are omitted from the Specifications, the description and quantities shown on the Drawings will govern.

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 PM/CM, in writing, prior to the commencement of Work at the site. Failure of the Contractor to notify the PM/CM, 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.

Any ambiguities or need for clarification of the Drawings or Specifications shall be immediately reported in writing to the PM/CM. Any such ambiguity or need for clarification will be handled by the PM/CM, in writing, as authorized by Article 11. No clarification of the Drawings and Specifications hereunder by the PM/CM will entitle the Contractor to any additional monies unless a Change Order has been processed as provided by Article 29 hereof.

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 PM/CM, shall not entitle the Contractor to additional monies and shall be done at the Contractor's risk.

ARTICLE 26 - SURVEYS

The Owner will furnish AutoCad files of the Construction Drawings to assist with construction layout of the Work. The County's benchmark information will be provided. From this information, unless 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 locations and other working points, lines, elevations and cut sheets.

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 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, that the products have passed the required tests prior to their incorporation into the Work. The Contractor shall promptly segregate and remove rejected products from the site of the Work.

(b) Inspection: The Contractor shall furnish the Owner with every reasonable facility for ascertaining whether or not the Work performed and products used are in accordance with the requirements and intent of the Specifications and Contract Documents. No Work shall be done or products used without suitable inspection by the Owner or the Owner's representative. Failure to reject any defective Work or product shall not in any way prevent later rejection when such defect is discovered, or obligate the Owner to final acceptance.

(c) 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 will not be authorized to alter or waive any requirements of the Contract Documents. The Resident Inspector may reject products or suspend the Work until any question at issue can be referred to and decided by the Owner. The responsibility of the Contractor is not lessened by the presence of the Resident Inspector.

(c) Rejection of Work and Materials: All products furnished and all Work done that is not in accordance with the Drawings or Specifications or that is defective will be rejected. All rejected products or Work shall be removed immediately. If rejected products or Work is not removed within 48 hours, the PM/CM will have the right and authority to stop the Work immediately and will have the right to arrange for the removal of said rejected products or Work at the cost and expense of the Contractor. All rejected products or Work shall be replaced with other products or Work which conforms with the Drawings and Specifications.

(e) Contractor's Responsibilities: Inspection of the Work will not relieve the Contractor of any obligations to fulfill the Contract and defective Work shall be made good regardless of whether such Work has been previously inspected by the Owner and accepted or estimated for payment. The failure of the Owner to reject improper Work shall not be considered a waiver of any defect which may be discovered later, or for Work actually defective.

ARTICLE 28 - CONTRACT TIME AND LIQUIDATED DAMAGES

The Contract Time and Liquidated Damages shall be defined in the Instructions to Bidders.

The Contractor shall proceed with the Work at a rate of progress which will insure completion within the Contract Time. It is expressly understood and agreed by and between the Contractor and the Owner, that the Contract Time for the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions, and other factors prevailing in the locality of the Work.

If the Contractor shall fail to perform the Work required within the Contract Time, or extended Contract Time if authorized by Change Order, then the Contractor shall pay to the Owner the full amount of liquidated damages specified in the Contract Documents for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.

The Contractor shall not be charged with liquidated damages or any excess cost when the delay in performance of the Work is due to the following and the Contractor has promptly given written notice of such delay to the Owner and PM/CM:

(a) To any preference, priority or allocation order duly issued by the Owner.

(b) To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God or of the public enemy, acts of the Owner, acts of another contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and,

(c) To any delays of subcontractors occasioned by any of the causes specified in paragraphs (a) and (b).

ARTICLE 29 - CHANGES IN THE CONTRACT

(a) Changes in the Work: The Owner may at any time, as the need arises, order changes within the scope of the Work without invalidating the Contract Agreement. If such changes increase or decrease the amount due under the Contract Documents, or in the time required for performance of the Work, an equitable adjustment will be authorized by Change Order.

The Owner, also, 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 changes in the Work so ordered by the Owner, 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 PM/CM immediate, written notice thereof and if required by the Owner, an immediate estimate of the direct cost of Work as outlined in (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.

Should the Contractor encounter, or the Owner discover, during the progress of the Work, subsurface or latent conditions at the site materially differing from those shown on the Drawings or indicated in the Specifications, or unknown conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Drawings and Specifications, the Owner shall immediately be notified in writing of such conditions before they are disturbed. The Owner will thereupon promptly investigate the conditions.

If the Owner finds that conditions do so materially differ, or are of an unusual nature, and upon written request of the Contractor, an equitable adjustment will be authorized by Change Order.

If the Contractor does not immediately notify the Owner in writing of the belief that a field order, additional work by other contractors or the Owner, or subsurface, latent or unusual unknown conditions entitles the Contractor to a Change Order, no consideration for time or money will be given the Contractor.

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 response to the Contractor's request for a change, following agreement by the Owner and Contractor on the change's scope, price and time.

(b) Changes in Contract Price: The Contract Price may be changed only by a Change Order. The value of any Work covered by a Change Order for increase or decrease in the Contract Price will be determined by one or more of the following methods, in the order of precedence listed below:

(1) By estimating the number of unit quantities of each part of the Work which is changed (either increased or decreased) and then multiplying the estimated number of such unit quantities by the price Bid (which price shall include the Contractor's overhead and profit) for a unit quantity thereof.

(2) The Owner will fix the total lump sum value of the change in the Work of the Contractor following the Contractor's submittal, within a reasonable time, of an estimate of the direct cost of the Work. The direct cost estimate will be added to, or deducted from, the Contract Price (which price will include the Contractor's overhead and profit as outlined below). If the Contractor does not submit a cost estimate of the Work in a reasonable time or if the Owner and Contractor do not reach agreement on the cost, the Owner may fix the total lump sum value at a reasonable amount. On any lump sum change which involves a net credit to the Owner, no allowance for overhead and profit will be figured.

(3) By ordering the Contractor to proceed with the Work and to keep and present, in such form as the Owner may direct, a correct account of the cost of the change together with all vouchers therefor. The cost hereunder will only include an allowance for overhead and profit as outlined below.

For the Work performed in item (2) or (3) above, payment will be made for the documented actual direct cost of the following:

(aa) Labor, including foremen, for those hours they are assigned and participating in the Work covered by the change order (actual direct payroll cost of wages). The Contractor shall furnish, if required by the Owner, certified payrolls to verify wages. All labor related costs will be included in a 30 percent markup of the cost of direct payroll wages. This refers to the Contractor's specific labor wages.

(bb) 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 Owner's acceptance.

(cc) 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.

In addition to the actual costs in items (aa) through (cc) above, there will be, for the Contractor actually performing the work, a fixed fee of 16 percent for bond, insurance, overhead and profit added to the cost of Items (aa), (bb) and (cc), above.

If all or a portion of the Change Order is performed by a subcontractor, payment will be made for the documented actual direct cost as outlined in (aa), (bb) and (cc), above. A fixed fee of 16 percent for bond, insurance, overhead and profit will be added to the cost of (aa), (bb) and (cc) of the subcontractor's work only.

A fixed fee of 10 percent will be added to the subcontractor's Work for the Contractor's administrative handling of portions of the Work that are performed by an approved subcontractor. No additional fixed fee will be allowed for the Contractor's or a subcontractor's administrative handling of Work performed by a subcontractor's subcontractor, unless by written permission from the Owner. All other costs not specifically listed above are considered to be included in the fixed fee.

(4) The Contractor shall, when required by the Owner, furnish the Owner with an itemized breakdown of the quantities and prices used in computing the value of any change that might be ordered, in a printed format, and with sufficient detail as required by the Owner.

(c) Changes in Contract Time: The Contract Time may be changed only by a Change Order. Changes in the Work described in (a) and any other claim made by the Contractor for a change in the Contract Time will be evaluated by the Owner with the assistance and input of the PM/CM and if the conditions warrant, an appropriate adjustment of the Contract Time will be made.

The Owner, 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 Owner, the Contractor is due an extension of time, then it will be granted by a Change Order and the Owner will pay the associated cost due the Contractor for direct field costs, only as outlined under Changes in Contract Price (aa) and (cc), exclusive of Item (bb), based on any delays to the overall Project. Extensions of time granted as a result of weather will not result in a change in Contract Price.

ARTICLE 30 - PAYMENTS AND COMPLETION

(a) Contract Price: The Contract Price is a lump sum stated in the Contract Agreement, 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.

It is further understood that the Contractor's proposed construction schedule is based on a normal 40 hour, 5 day work week, less recognized holidays. If the Contractor desires to work in excess of this limit, the Contractor shall submit a written request to the Owner a minimum of five days prior to the desired work date. The Contractor shall be responsible for any additional expenses incurred by the Owner as a result of the extended work hours, including resident inspection overtime. The cost associated with resident inspector overtime will be deducted from the Contractor's monthly payment request.

(b) Breakdown of Cost: Before the first application for payment the Contractor shall submit to the PM/CM a breakdown of cost for the various portions of the Work, including quantities if required by the PM/CM, aggregating the total Contract Price prepared in such form as specified or as the PM/CM and the Contractor may agree upon and supported by such data to substantiate its correctness as the PM/CM may reasonably require.

This schedule of values, when approved by the PM/CM, will be used only as a basis for the Contractor's application for payment; however, the payment schedule will correlate directly with the Overall Project Schedule (OPS) cost information, when applicable.

(c) Progress Payments: At the end of each calendar month, the Contractor shall submit to the PM/CM an itemized application for payment supported by such other substantiating data as the PM/CM may reasonably require covering Work completed through the 20th day of the month. Progress payments shall be submitted to the PM/CM no later than the 25th of the month. Any progress payment submitted by the Contractor after the 5th of the month will be included in the following month's payment.

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 PM/CM. 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 PM/CM'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 operations 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 PM/CM, 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.

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

The Contractor warrants that title to all Work and products covered by an Application for 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 which may be withheld from suppliers and subcontractors to guarantee completion and performance).

(d) Certificate for Payment: If the Contractor has made application for payment as provided above, the PM/CM will issue a Certificate for Payment to the Owner, with a copy to the Contractor, for such amount as the PM/CM determines to be properly due, or the PM/CM will state, in writing, itemized and specific reasons for withholding a

Certificate as provided herein.

After the PM/CM has issued a Certificate for Payment, the Owner will pay to the Contractor the amount covering Work completed plus stored products, less retention and less previous payments made.

No certificate for a progress payment, nor any progress payment, nor any partial or entire use of occupancy of the Project by the Owner, shall constitute an acceptance of any Work not in accordance with the Contract Documents.

(e) Retention: The Owner will retain the following amounts from each properly certified estimate:

(1) Until the value of the Work completed, including stored materials, is at least 50 percent of the Contract amount, 10 percent of the value of all Work satisfactorily completed, including stored materials.

(2) When the value of the completed Work totals at least 50 percent of the Contract amount, the Owner will discontinue retaining additional amounts provided the Work is progressing satisfactorily and there is no specific cause for retaining a larger sum. The total amount retained will be at least 5 percent of the Contract amount, adjusted for Change Orders, until the date of final payment.

(3) The Owner may elect to reinstate retention of 10 percent of the value of the Work completed if at any time the Contractor fails to make satisfactory progress or if there is other specific cause. Satisfactory progress is identified as conforming to the construction progress schedule as required in Article 24, as modified by the Supplementary Conditions. No form of collateral in lieu of cash will be acceptable as retainage. Amounts retained by the Contractor from payments due to suppliers and subcontractors (expressed as a percentage) shall not exceed that being retained by the Owner.

(f) Payments Withheld: The PM/CM may decline to approve an Application for Payment and may withhold certificate, in whole or in part, as may be necessary to protect the Owner from loss because of:

(1) Failure of the Contractor to make payments properly to subcontractors or for labor or products.

(2) Unsatisfactory prosecution of the Work by the Contractor either due to quality of the Work or if the Contractor is behind the currently approved construction schedule. When the above reasons for nonpayment are corrected, then payment will be made for amounts withheld because of such reasons, not later than the next payment. Completion and Final Acceptance shall be as stipulated in the Supplementary Conditions.

END OF SECTION

SECTION 00800
Supplementary Conditions

GENERAL

The provisions in this Section of the Specifications shall govern in the event of any conflict between this Section and the General Conditions.

ARTICLE 1 - NOTICE OF AWARD OF CONTRACT

Article 1 - Notice of Award of Contract, of the General Conditions, is hereby modified to include the following:

Within 120 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 120 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 13 - LAWS AND REGULATIONS

Article 13 - Laws and Regulations, of the General Conditions is hereby modified to include the following:

Article 13, following first paragraph,

Where professional engineering work is required in connection with any of the components required by the Contract, all Bidders and component suppliers must insure that there is full compliance with all applicable laws of the state of Georgia and any other state governing professional engineering. The Owner and PM/CM do not warrant that the name of an entity listed as an acceptable manufacturer is or will be in compliance with said laws.

ARTICLE 15 - NOTICE AND SERVICE THEREOF

Article 15 - Notice and Service Thereof, of the General Conditions is hereby modified to include the following:

(c) All papers required to be delivered to the Owner shall, unless otherwise specified in writing to the Contractor, be delivered to the Rockdale Water Resources Commissioners, 943 Court Street, Conyers, Georgia 30012, Attn: Oz Nesbitt, Chairman, Board of Commissioners.

Any notice to or demand upon the Owner shall be sufficiently given if delivered to the

Office of said Chairman 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 said Chairman 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.

(e) The Contractor shall file all "Notices of Commencement" required for this Project in accordance with O.C.G.A. §44-14-361.5 et.seq. and §36-82-104 et.seq., as applicable. The Contractor shall respond to all requests for copies of a Notice of Commencement. Should the Owner or PM/CM receive such a request, this request will be forwarded to the Contractor for further handling. The name and address of the Owner shall be as stated in paragraph (c) of this Article. The name and general description of the Project shall be as stated in the Invitation to Bid.

ARTICLE 17 - LAND AND RIGHTS-OF-WAY

Article 17 - Lands and Rights-of-Way, of the General Conditions, is hereby modified to include the following:

No additional requirements.

ARTICLE 20 - INTERRUPTION OF FACILITY OPERATIONS

Article 20 - Interruption of Facility Operations, of the General Conditions, is hereby modified to include the following:

Bypasses/interruption of untreated or partially treated wastes will not be permitted unless the Contractor has obtained prior approval from the Owner. The Owner/PM/CM shall be notified at least two weeks in advance and in writing, of the date, time and duration of such bypasses/interruption. The Contractor shall pay all fines that may be imposed on the Owner for the bypassing without prior approval.

ARTICLE 24 - SCHEDULES, REPORTS AND RECORDS

Article 24 - Schedules, Reports and Records, of the General Conditions, is hereby modified to include the following:

(a) The Contractor shall submit to the Owner progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed as stipulated in the various sections of these Specifications.

(b) Immediately after execution of the Contract by the Owner, and before the first partial payment is made, the Contractor shall deliver to the Owner a construction progress schedule in form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required

under the Contract Documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the Progress Schedule.

(c) An updated schedule and an updated Schedule of Submittals shall be presented with each partial payment request. Lack of an updated schedule and/or an updated Schedule of Submittals will delay processing of the pay request until receipt of the updated schedule and/or an updated Schedule of Submittals.

(d) If the schedule reflects a completion date prior to the completion date established by the Contract Agreement, this shall afford no basis to claim for delay should the Contractor not complete the Work prior to the projected completion date. Instead all "float" between the completion date in the Contractor's schedule 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.

(e) The Contractor shall maintain on the Project site, a complete set of up-to-date Record Documents.

(f) Project Coordination Meetings: The General 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 PM/CM.

(g) Contractor's Responsibilities

(1) Implement the detailed Near Term Schedule of activities to the fullest extent possible between Project Coordination Meetings.

(2) The Contractor shall prepare and provide one copy of the Contractor's Daily Report to the PM/CM 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 CPM 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 a time extension would be forthcoming, the Contractor shall attempt to reschedule the activity to be consistent with the Overall Project Schedule so as not to delay any of the Contract milestones. The Contractor agrees that:

a. The Contractor shall attempt to expedite the activity 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.
3. Commit to overtime or increased crew sizes for subsequent activities, or some combination of the above as deemed suitable by the PM/CM.

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

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

(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 30 - PAYMENTS AND COMPLETION

Article 30 - Payments and Completion, of the General Conditions, is hereby modified to include the following:

(g) Completion: ALL WORK REQUIRED BY THE CONTRACT DOCUMENTS, CONTRACT DRAWINGS AND SPECIFICATIONS MUST BE COMPLETED BEFORE THE FINAL INSPECTION IS PERFORMED. This includes, but is not limited to, the following:

(1) Performing tests as described in the detailed Specifications.

(2) Removing temporary plugs, bulkheads, bypasses, etc., and diverting flow into the facility when approved by the PM/CM.

(3) Grassing and restoration of the work area.

Upon completion of all work required, the Contractor shall submit completed Record Drawings to the PM/CM and request, in writing, that the final inspection be performed. The PM/CM will arrange for final inspection of the work by the Owner and Designer. If the PM/CM 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, PM/CM will recommend to the Owner that the job 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 PM/CM will arrange a 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 termination date for the Contractor's liability for the physical properties of the facilities and the beginning of the warranty period.

Before final payment can be made, the Contractor must certify, in writing, to the Owner that all payrolls, materials bills, and other indebtedness connected with the work have been paid. If requested by the PM/CM, the Contractor shall provide release of lein documentation from subcontractors or suppliers.

Final payment will not be made if there is disputed indebtedness or if there are liens upon the property.

If upon completion of all work there is disputed indebtedness or there are liens upon the property, semi-final payment may, be made, at the Owner's option, in accordance with the following provisions:

(1) The Owner will retain an amount equal to the disputed indebtedness and/or liens upon the property including all related cost and interest in connections with said disputed indebtedness and liens which the Owner may be compelled to pay upon and subsequent adjudication.

(2) The Contractor shall certify to those items of work not disputed that all payables, materials bills and other indebtedness connected with the work have been paid or otherwise satisfied.

The making of the final payment shall constitute a waiver of all claims by the Owner, other than those for faulty work covered by and appearing within the warranty period.

The acceptance of final payment shall constitute a waiver of all claims by the Contractor, except those previously made, in writing, and still unsettled.

(h) Prompt Payment Clause

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

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

on the unpaid balance as may be due.

b. Payment Periods:

1. When the Contractor has performed in accordance with the provisions of these Contract Documents, the Owner shall pay the Contractor within 45 days of receipt by the Owner or the Owner's representative of any properly completed Application for Payment, based upon work completed or service provided pursuant to the terms of these Contract Documents.
2. When a subcontractor has performed in accordance with the provisions of its subcontract and the subcontract conditions precedent to payment have been satisfied, the Contractor shall pay to that subcontractor and each subcontractor shall pay to its subcontractor, within ten days of receipt by the Contractor or subcontractor of each periodic or final payment, the full amount received for such subcontractors work and materials based on work completed or service provided under the subcontract, less retainage expressed as a percentage, but such retainage shall not exceed that retainage being held by the Owner, provided that the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete its work as the Contractor in its reasonable discretion may require, including but not limited to a payment and performance bond.

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

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

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

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

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

END OF SECTION

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.01 THE REQUIREMENT

A. The work to be performed under this contract shall consist of furnishing and installation of all tools, equipment, materials, supplies, manufactured articles, transportation and services, including fuel, power, water, and essential communications, for the performance of all labor, work, and/or other operations as required form the fulfillment of the Contract in strict accordance with the Contract Documents. The work shall be complete, and all work, materials, and services not expressly shown or called for in the Contract Documents which may be necessary for the complete and proper construction of the Work in good faith shall be performed, furnished, and installed by the Contractor as though originally so specified or shown, at no increase in cost to the County.

B. Wherever the Contract Documents address a third party, i.e., subcontractor, manufacturer, etc., it is to be considered as the Contractor through the third party.

C. Wherever a reference to number of days is noted, it shall be construed to mean calendar days.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. The work of this contract consists of, but is not limited to, the extension of an 8" sewer main from Hightower Elementary, then along Georgia Highway 138 up th White Road. The work includes construction, and installation of 8 inch sanitary sewer lines, manholes, associated site work, erosion and sedimentation control, and other appurtenances.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE

A. The Bid lists each item of Work 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 necessary for the satisfactory completion of the Work, which are not specifically listed in the Bid, and not specified in this Section to be measured or included in one of the items listed in the Bid, shall be considered incidental to the Work. All costs thereof, including Contractor's overhead costs and profit and all mobilization costs for the Contract duration shall be included in the unit prices bid for the various Bid items. The Contractor shall prepare the Bid accordingly.

No separate or future payments shall be made for MOBILIZATION except as specifically shown in the Bid.

C. Work includes furnishing all plant, labor, equipment, tools, power and materials, and performing all operations required to complete the Work satisfactorily, 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. The Record Drawing quantities shall be determined by a survey after the completion of all required work. The survey shall conform to Article 24 - Schedules, Reports and Records as specified in Section 00800, Supplementary Conditions. The precision of measurement for final payment quantities shall match the precision shown for that item in the Bid.

1.03 PAYMENT

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

B. 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 relate 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.

C. Payment will be made by extending unit prices multiplied by quantities provided and then summing the extended prices to reflect actual work. Such price and payment shall constitute full compensation to the Contractor for furnishing all plant, labor, equipment, tools and materials not furnished by the Owner and for performing all operations required to provide to the Owner the entire Project, complete in place, as specified and as indicated on the Drawings.

D. The Contractor shall not be paid separately for any maintenance of traffic. The cost for maintenance of traffic shall be included in the unit price for the item to which it pertains. We expect this item to be minimal. Work on Hightower Elementary shall be performed when school is not in session.

E. The Contractor shall carefully acquaint himself with all work associated with each payment item and shall have no claim for his unfamiliarity with the requirement of various items.

i. The Contractor shall have included in his various bid items, an amount to cover costs for additional work which may be necessary, to deliver equipment and products to the project sites as required for project completion.

ii. The Contractor shall have included in his various bid items, an amount to cover costs for additional work which may be necessary, to construct the water mains in the close proximity of underground facilities, services, poles and other facilities which may exist.

iii. The discovery of an underground facility during the construction, not shown on the Contract Drawings shall not constitute automatic initiation of a change order. The additional work to cross or pass this underground facility must be substantial for consideration for additional payment.

1.04 CLEARING AND GRUBBING

A. No separate payment shall be made for clearing and grubbing.

B. The cost of moving and reestablishing landscape features, including labor and materials, shall be included in the unit price bid for the item to which it pertains.

1.05 TRENCH EXCAVATION AND BORING PIT EXCAVATION AND BACKFILL

A. No separate or additional payment will be made for any special or unique method, means, techniques or equipment necessary for the Contractor's compliance with these Specifications, regulatory requirements, permits, laws or regulations which govern this Project.

B. Trench Excavation: No separate payment will be made for trench excavation. All costs shall be included in the unit price bid for the item to which it pertains at the appropriate depth.

C. Sheeting, Bracing and Shoring: No separate payment will be made for providing any sheeting, bracing and shoring.

D. Pipe Trench Rock and Boring Pit Rock Excavation

1. Trench rock excavation shall be paid for as an extra in addition to payment for pipe provided for elsewhere in these Specifications. Payment will be made for the measured quantity of rock excavated, at the sum of the unit prices for Rock excavation

2. The maximum allowable volume of pipe trench rock excavation for payment shall be based on a trench width equal to the outside diameter of the pipe barrel plus 18-inches, but not less than 36-inches total width, and depth of rock on the pipe centerline, from the top of the rock to the bottom of the rock or the specified bottom of the trench, whichever has the higher elevation. Length of rock shall be actual length measured along the centerline of pipe.

3. The Owner must be given reasonable notice to measure all rock.

4. No allowance shall be made for excavating to extra widths for construction of manholes or other appurtenances, for excavating to sloping sides, or for excavation made necessary by the physical limitations of the Contractor's equipment. Cost of such additional rock excavation shall be included in the unit price bid for the item to which it pertains.

5. The unit price for Rock Excavation shall include the cost of rock excavation, blasting, blast monitoring, blast surveys, and all costs incidental thereto.

E. Dewatering Excavations: All costs of equipment, labor and materials required for dewatering shall be included in the price bid for the item to which it pertains.

F. Bedding and Haunching

1. The unit price bid for pipe for SANITARY SEWER LINE shall include the excavation of the trench to the depth below the pipe necessary to provide specified bedding and to lay the new sewer main. Measurements for payment will be made from ground surface to the pipe invert.

2. No separate payment will be made for material used to provide specified bedding. The cost of all bedding materials shall be included in the unit price bid for the item to which it relates, except for trench stabilization.

3. No additional payment will be made for improved bedding required to compensate for over excavation of the trench.

G. Initial Backfill

1. No separate payment shall be made for initial backfill.

2. No separate payment shall be made for drying out the initial backfill material in order to meet the compaction requirements.

3. No separate payment shall be made for the adding of moisture to the initial backfill

materials in order to meet the compaction requirements.

4. No separate payment shall be made for providing select material if the insitu material cannot meet the compaction requirements.

I. Final Backfilling

1. No additional payment will be made for additional material when excavated materials are used.

2. No separate payment shall be made for drying out the final backfill material in order to meet the compaction requirements.

3. No separate payment shall be made for the adding of moisture to the final backfill materials in order to meet the compaction requirements.

4. No additional payment will be made for providing select material if the insitu material cannot meet the compaction requirements.

1.06 SANITARY SEWER LINE AND ACCESSORIES

A. Existing Utilities and Obstructions –

Horizontal and Vertical Conflict: Payments for conflicts with existing utilities shall be made only where the Owner approves additional lengths of pipe. Said payment shall be made at the unit prices in the Bid. No other payment will be made for any delay or extra cost encountered by the Contractor due to protection, avoidance or relocation of existing utilities, mains or services or changing the horizontal or vertical alignment of the sewer.

B. Location and Grade - No separate payment shall be made for survey work performed by or for the Contractor in the establishment of reference points, benchmarks, cut sheets, limits of right-of-way or easement, including their restoration, as well as centerline or baseline points.

C. Laying and Jointing Pipe and Accessories

1. Measurement for payment at the unit price for SANITARY SEWER LINE shall be made for the actual quantity installed. Depth of cut shall be measured from pipe invert to ground level at pipe centerline. Cut sheets prepared by the Contractor and approved by the Owner shall be the basis for payment.

2. No additional payment will be made for replacement of defective materials.

3. No additional payment will be made for maintaining service while placing the new water main in service.

4. Payment for furnishing and installing Ductile Iron or PVC will be made at the unit price per linear foot of pipe named in the Bid Schedule, which shall constitute full compensation for the complete operation including, but not limited to, providing all necessary pipe, excavation, bedding, testing, clean-up, removal/disposal of existing pipe in trench, clearing and grubbing, as-builts, restraints and accessories, dewatering, backfilling, compaction and all restoration to land surface and other work that is not designated as a bid item. .

5. Payment shall be made only where authorized by the Owner for sewer to be removed and installed.

6. Clean-up and Testing: No separate payment will be made for clean-up and testing. All costs shall be included in the unit price bid for the item to which it pertains.

1.07 STEEL CASING

A. This item will be paid for at the unit price bid per linear foot of casing or each size and type of installation. The price bid shall be full compensation for all labor, tools, equipment, and incidental materials, including jacking, boring, excavation for bore pits and receiving pits, mucking, dewatering, backfill and restoration necessary to install the casing and seal the ends of the casing pipe. Carrier pipe inside the steel casing will be paid for separately. Casing spacers will included with this pay item.

1.08 STANDARD MANHOLE AND EXTRA DEPTH MANHOLE

A. Manholes shall be counted in place and paid at the price per size bid. Bid price shall be full compensation for excavation, dewatering, crushed stone subgrade, precast manhole base and sections or risers, rubber boots, steps, ring and cover, and all incidentals needed to construct the manhole as shown on the drawings and as specified.

B. Each manhole shall be measured from the invert of the lowest pipe at the center of the manhole to the top of the manhole ring. Standard manholes cover the range of depth from 0 to 6-feet. When the depth of a manhole is more than 6 feet, the difference between 6-feet and 12 feet or 16 feet shall be paid at the unit price bid per vertical foot for the Extra Depth Manhole (6' to 12' depth or 12' to 16') item in the Bid Proposal. As an example, for a manhole 11-feet deep, 6-feet are included in Standard Manhole and 5-feet would be included in Extra Depth Manhole (6' to 12' depth). Crushed stone used for the base of each manhole shall be included in this item.

1.09 BY PASS PUMPING / FLOW CONTROL

A. Since this is a sewer extension project there will be no bypass pumping setup related to this project.

1.10 EROSION & SEDIMENATION CONTROL

A. This pay item shall include all work required to comply with the National Pollutant Discharge Elimination System (NPDES) General Permit to discharge Storm Water Associated with Infrastructure construction projects. This item shall include submitting Notices of Intent and Termination to EPD and all sampling, testing, monitoring, reporting, recordkeeping and certifications required by the Permit and the ESPCP prepared by the Engineer. It shall also include installation and maintenance of any Best Management Practices required.

1.11 MOBILIZATION

A. The Bid Proposal includes a pre-set price for this item, which is intended to partially offset the Contractor's expense related to mobilizing personnel, equipment, facilities, and supplies to the jobsite, and the expense of administration, insurance and bonding throughout the project. Payment for this item will be phased over the life of the project as follows: 50% of the bid price of this item will be payable when in the opinion of the Engineer, the Contractor's mobilization is sufficient to pursue the Work to meet the Completion Date. 25% of the bid price will be made when the approval of all material submittals has been obtained. The final 25% for the bid price will be payable when As-Built drawings are submitted – this payment will be prorated to include partial submittals of As-Built drawings as the work progresses.

END OF SECTION

SECTION 01026
SCHEDULE OF VALUES

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: Provide a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents.

1.02 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 0 and Division 1 of these Specifications.

1.03 GENERAL

A. For accounting purposes for the Engineer's convenience and as an aid in determining progress payments and price additions or deductions for Contract modifications, the Contractor shall furnish to the Engineer a schedule of values which shall be approved.
   1. The schedule of values shall apportion the total amount of the Contract price(s) for each separate item among the main features or costs that form the completed Work.
   2. The price breakdown shall be in sufficient detail to permit an analysis of all material, labor, equipment, subcontract and overhead costs, as well as profit, and shall cover all work involved for the properly completed item and feature listed.
   3. Any amount claimed for subcontracts shall be supported by a similar schedule of values with the total amount shown by this price under the Contract price stated in the bid form.

1.04 SUBMITTALS

A. Prior to first application for payment, submit a proposed Schedule of Values to the Engineer.
   1. Meet with the Engineer and determine additional data, if any, required to be submitted.
   2. Secure the Engineer's approval of the Schedule of Values prior to submitting first application for payment.

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
UPPA	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

H. Government and Technical Organizations Contd.

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 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

END OF SECTION

SECTION 01200
PROJECT MEETING

PART 1 GENERAL

1.1 GENERAL

A. Owner's Project Representative will schedule physical arrangements for meetings throughout progress of Work, prepare meeting agenda with regular participant input and distribute with written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes within 5 days after each meeting to participants and parties affected by meeting decisions.

1.2 SUBMITTALS

A. Administrative Submittals:

1. Provide suggested agenda for pre-installation meeting and facility start-up meeting to Owner's Project Representative to include reviewing conditions of installation, preparation and installation or application procedures, and coordination with related Work and work of others.

1.3 PRECONSTRUCTION CONFERENCE

A. Be prepared to discuss the following subjects, as a minimum:
   1. Required schedules.
   2. Status of Bonds and insurance.
   3. Sequencing of critical path work items.
   4. Progress payment procedures.
   5. Project changes and clarification procedures.
   6. Use of site, access, office and storage areas, security and temporary facilities.
   7. Major product delivery and priorities.
   8. CONTRACTOR's safety plan and representative.

B. Attendees will include:
   1. Owner's representatives.
   2. CONTRACTOR's office representative.
   3. CONTRACTOR's resident superintendent.
   4. CONTRACTOR's quality control representative.
   5. Subcontractors' representatives whom CONTRACTOR may desire or ENGINEER may request to attend.

6. ENGINEER's representatives.
7. Others as appropriate.

1.4 PRELIMINARY SCHEDULES REVIEW MEETING

A. As set forth in General Conditions and Section 01310, PROGRESS SCHEDULES.

1.5 PROGRESS MEETINGS

A. Owner's Project Representative will schedule regular progress meetings at site, conducted weekly to review Work progress, progress schedule, Shop Drawing and Sample submissions schedule, Application for Payment, contract modifications, and other matters that require discussion and resolution.

B. Attendees will include:

1. Owner's Project Representative and others, as appropriate.
2. CONTRACTOR, Subcontractors, and Suppliers, as appropriate.
3. ENGINEER's representative(s).
4. Others as appropriate.

C. ENGINEER shall prepare agenda and distribute 48 hours prior to meeting, preside at meetings, and prepare and distribute minutes of proceedings to all parties.

D. CONTRACTOR shall provide data required and be prepared to discuss all items on agenda.

E. Agenda:

1. Agenda will include but not necessarily be limited to the following:
   a. Revisions and/or Corrections to Previous Minutes.
   b. Unresolved Items.
   c. Administrative Items.
   d. New Agenda items to be discussed.
   e. Change Orders and review of Change Order Log.
   f. Shop Drawings and review of Shop Drawing Log.
   g. Request for Information (RFI) and review of RFI Log.
   h. Request for Proposal (RFP) and review of RFP Log.
   i. Problems, Conflicts, Observations.
   j. Coordination with OWNER and other CONTRACTOR's.
   k. Progress since last meeting.
   l. Planned Progress for Next Meeting and milestone work.
   m. Schedule Assessment / Delay.

n. Project security and Project Safety.
o. Testing.
p. Subcontractors.
q. Work Hours.
r. Other Business and planned visitors

1.6 QUALITY CONTROL AND COORDINATION MEETINGS

A. Scheduled by Owner's Project Representative on regular basis and as necessary to review test and inspection reports, and other matters relating to quality control of Work and work of other contractors.

C. Attendees will include:

1. CONTRACTOR.
2. CONTRACTOR's designated quality control representative.
3. Subcontractors and Suppliers, as necessary.
4. Owner's Project Representative.
5. ENGINEER's representative(s), as necessary.

1.7 PREINSTALLATION MEETINGS

A. When required in individual Specification sections, convene at site prior to commencing Work of that section.

B. Require attendance of entities directly affecting, or affected by, Work of that section.

C. Notify Owner's Project Representative 5 business days in advance of meeting date.

1.8 OTHER MEETINGS

A. In accordance with Contract Documents and as may be required by OWNER and ENGINEER.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTIONS (NOT USED)

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 program/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 QUALITY ASSURANCE

The Project Schedule shall be developed using Microsoft Project or other approved method/program. Coordinate with the PM/CM to insure compatibility of software and computer systems.

1.03 SUBMITTALS

A. Project Schedule

1. Submit the Project Schedule within 5 days after date of the Notice to Proceed.

2. The PM/CM will review schedule and will return the reviewed copy within 5 days after receipt.

3. If required, resubmit within five days after receipt of a returned review copy.

B. Updating: Submit an update of the schedule with each request for payment.

C. Submit the number of copies required by the Contractor, plus four copies to be retained by the PM/CM.

1.04 APPROVAL

Approval of the Contractor's construction program and revisions thereto, shall in no way relieve the Contractor of any duties and obligations under the Contract. Such 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.

1.05 PRELIMINARY PROJECT SCHEDULE (PPS)

A. The Project Schedule shall be a bar chart or time scaled network diagram showing the Contractor's proposed operations.

1.06 UPDATING

A. Written Narrative Report: Provide a written narrative report with each update including:

1. A status review of the Project.

2. A discussion of problem areas including current and anticipated delay factors and their impact.

3. Direct action taken, or proposed, and its effect.

4. A description of revisions including:

   a. Their effect on the schedule due to the change of scope.
   b. Revisions in duration of activities.
   c. Other changes that may affect the schedule.

5. A listing of behind-schedule materials and equipment procurement activities.

6. A listing of any significant changes in the activities and restraints occurring since the last update and why the changes were made.

B. Critical Work List: Provide a listing of critical work to be performed prior to the next Project Coordination Meeting, specifically listing what must be done during the next 30 days to stay on the critical path schedule.

C. At each Project Coordination Meeting, the Contractor shall present for discussion the most current update of the schedule.

END OF SECTION

SECTION 01320

CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.01 SCOPE

A. The Contractor shall furnish all equipment and labor materials required to provide the Owner with construction photographs of the Project.

B. Negatives shall become the property of the Owner and none of the photographs 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 photographs of the 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 photographs.

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

D. The Contractor shall coordinate the taking of pre and post-construction photographs with the PM/CM. The PM/CM shall observe the taking of the photographs.

E. The pre-construction photographs shall be submitted to the PM/CM within 20 calendar days after the date of receipt by the Contractor of Notice to Proceed. Post-construction photographs shall be provided prior to final acceptance of the project.

1.03 PROGRESS PHOTOGRAPHS

A. Photographs shall be taken to record the general progress of the Project during each pay period. Photographs shall be representative of the primary work being performed at that time.

B. The photographs shall include the date and time marking of the recording. All photographs shall be labeled on a tab connected to the bottom of the photo to indicate date and description of work shown.

C. A minimum of 10 photographs shall be submitted with each request for payment. The

view selection will be as agreed to with the PM/CM. Two prints of each photograph shall be submitted to the PM/CM.

1.04 SUBMITTALS

A. A CD disc is an acceptable method for submitting the photographs.

B. Construction photographs shall be submitted with each payment request. Failure to include photographs may be cause for rejection of the payment request.

END OF SECTION

SECTION 01510
TEMPORARY FACILITIES

PART 1 GENERAL

1.01 DESCRIPTION

A. The work of this Section shall consist of providing the following temporary facilities:

1. Water,
2. Sanitary Facilities,
3. Electrical Service

PART 2 PRODUCTS

2.01 TEMPORARY WATER

A. Drinking water shall be provided by the Contractor for his personnel and the personnel of his sub-contractors.

1. Drinking water shall be tested and approved by the State Agency as "safe drinking water suitable for human consumption".
2. Contractor shall furnish water for construction.

2.02 TEMPORARY SANITARY FACILITIES

A. Sanitary conveniences, properly screened from public observation, for the use of all persons employed on the work and beginning with the first man engaged in preliminary operations, shall be provided and maintained by the Contractor in sufficient numbers through the completion of the work.

B. Contractor shall be diligent in maintaining sanitary facilities; pumping weekly, or more often as required to protect soil and water quality.

2.03 ELECTRICAL SERVICES

A. Provide the necessary temporary electrical service connections as required by the local electrical power provider.

1. Temporary distribution wiring and boxes as needed by the construction trades working on the site(s).
2. Temporary service to field offices.

END OF SECTION

PART 3 EXECUTIONS (Not Applicable)

END OF SECTION

SECTION 01570
TRAFFIC REGULATION

PART 1 GENERAL

1.01 DESCRIPTION

A. The work under this Section shall consist of maintaining and protecting traffic in the project area to the satisfaction of the applicable Local Regulatory Agencies, and the Owner.
   1. Unless otherwise specified within the Contract Documents, the Contractor must maintain pedestrian and vehicular traffic and permit access to businesses, factories, residences, and intersecting streets

PART 2 PRODUCTS

2.01 TRAFFIC SIGNS

A. The Contractor shall furnish light(s) and maintain traffic signs as may be directed, or may be necessary for the safe regulation, or convenience of traffic.
   1. Said signs shall be as shown or noted on the Contract Drawings or elsewhere herein, or if not specified, they shall be adequate for the regulation, safety and convenience of traffic and in conformance with the applicable requirements of the State/Federal Manual on Uniform Traffic Control Devices.

2.02 BARRICADES

A. Suitably lighted barriers or barricades shall be furnished by the Contractor and put up and maintained at all times during the night or daytime, around all open ditches, trenches, excavation, or other work potentially dangerous to traffic.
   1. Such barricades shall be as shown on the Contract Drawings, or if not shown, shall be constructed of 2 inch by 8 inch rough lumber, securely supported, braced and at least 3 feet high above the ground.
   2. Barricades shall be placed on all sides and throughout the entire length and breadth of all open ditches, trenches, excavations, or other work which must be barred to the general public.
   3. Barricades shall be properly painted to the satisfaction of the Local Regulatory Agency in order to retain a high degree of visibility to vehicular and pedestrian traffic.

2.03 FLASHERS

A. The Contractor shall furnish and securely fasten flashing units to signs, barricades, and other objects in such numbers and for such lengths of time as are required for the maintenance and protection of traffic.

1. The flashers shall be in operation during all hours between sunset and sunrise, and during periods of low visibility.
2. Suitably lighted barricades shall be defined as barricades lit by flashers in accordance with this Section or other lighting methods approved by the Local Regulatory Agency in lieu thereof.
3. Flashers shall be placed along the entire length of the barricades at an interval no greater than 8 feet, center to center. Flashers shall be power operated, lens directed, enclosed light units which shall provide intermittent light from 70 to 120 flashers per minute, with the period of light emittance occurring not less than 25 percent of each on-off cycle, regardless of temperature.
4. The emitted light shall be yellow in color and the area of light on at least one face of the unit shall be not less than 12 square inches. The discernible light shall be bright enough to be conspicuously visible during the hours of darkness at a minimum distance of 800 feet from the unit under normal atmospheric conditions.
5. For units which beam light in one or more directions, the foregoing specifications shall apply 10 degrees or more to the side and 5 degrees or more above and below the photometric axis.

2.04 TEMPORARY BRIDGING

A. The Contractor shall include in his bid, bridging for trenches at and all street and driveway crossings in such manner as the Local Regulatory Agency may direct for the accommodation and safety of the traveling public, to provide facilities for access to private driveways for vehicular use, and to prevent blocking of intersecting traffic.

1. He shall erect suitable barriers around the excavation to prevent accidents to the public and shall place and maintain, during the night, sufficient lights on or near the work.
2. A space of 20 feet must be left so that free access may be had at all times to fire hydrants and proper precautions shall be taken so that the entrances to fire hydrants and fire stations shall not be blocked or obstructed.

2.05 DETOURS

A. Temporary detours shall be constructed on the site as proposed by the Contractor and approved by the Applicable State and/or Local Authorities required by the Contract Drawings or specified elsewhere herein.

1. Detours shall not have grades in excess of 10% anywhere along their lanes unless otherwise shown on the Contract Drawings. Detours shall be smooth riding.
2. Suitable barricades shall be installed continuously along both sides of a detour where:
   a. The adjacent side slope is steeper than 1 on 6 inches.
   b. The Contractor's operations or equipment may operate within 20 feet of the detour.
   c. Other unsafe conditions requiring them for the protection of traffic along the line of detour.

2.06 MISCELLANEOUS

A. The Contractor may be required to employ traffic persons and/or uniform police officers as required and take other such reasonable means or precautions as the Local Regulatory Agency may direct, or as may be needed to prevent damage or injury to persons, vehicles, or other property and to minimize the inconveniences and danger to the public by his construction operations.

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 DESCRIPTION

A. The work of this Section consists of procedures and requirements for contract closeout, such as cleaning, restoration of project site to original condition, inspections and guarantees.

PART 2 MATERIALS (Not Applicable)

PART 3 EXECUTIONS

3.01 CLEANING UP

A. During its progress, the work and the adjacent areas affected thereby shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

B. All local water courses, catch basins and drains discharge into the drinking water reservoir. No material or debris shall be washed or flowed into or be placed in watercourses, ditches, gutters, drains, catch basins, or elsewhere as a result of the Contractor's operations, such material or debris shall be entirely removed and legally disposed of during progress of the work, and the ditches, channels, drains, etc., shall be protected from spillage and kept in a neat, clean and functioning condition.

C. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operation in a neat and satisfactory condition.

D. Unless otherwise specifically directed or permitted in writing, the Contractor shall perform the following tasks:
   1. Tear down and remove all temporary buildings and structures built by him.

2. Remove all temporary works, tools, and machinery or other construction equipment furnished by him.
3. Remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by him.
   a. Subsequent to disinfection, remove or suitably neutralize disinfectant residuals from treated area(s).
4. Remove all rubbish from any grounds which he has occupied.
5. Leave roads and all parts of premises and adjacent property affected by his operations in a neat and satisfactory condition.

3.02 RESTORATION

A. The Contractor shall restore or replace, when and as directed by the Engineer, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations.
   1. To this end, the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work.
   2. Suitable materials, equipment and methods shall be used for such restoration, or as required in other divisions of this Specification.

B. In restoring the disturbed areas the Contractor shall:
   1. Replace to an equivalent depth any loam that has been removed during the excavation.
   2. Remove from the property and legally dispose of in an approved fashion all trees, brush and other items that the Contractor has cut in order to prosecute his work.
   3. Remove from the property upon completion of the work thereon, all excess materials of construction such as stone, pipe, concrete block, gravel, etc., that the Contractor may have stockpiled for use during the course of the work.
   4. Leave the land in a smooth, even condition. All ruts, holes or other undesirable grading conditions which resulted from work under this Contract shall be filled and the area so graded to eliminate ponding.
   5. All drainage course(s) shall be restored to their pre-existing condition or better.
   6. Reset all public or private monuments, iron pipes or other types of property line and geodetic markers damaged or disturbed by operations under this Contract. This work shall be done by a licensed land surveyor at no additional cost.

7. Repair, reset or replace as directed all pipes, walls, utilities, fences, railings, stone walls, etc., and ornamental or utilitarian domestic accessories, such as, but not limited to, arbors, fireplaces, sheds and incinerators, or other surfaces structures, or property which may have been damaged, either directly or indirectly by his operations under this Contract.
8. Restore to a condition at least equal to that in which they were found immediately prior to the beginning of construction all sidewalks, gutters, driveways and curbs which have been damaged by the Contractor's operations.

3.03 FINAL INSPECTION

A. At completion of all work, the Owner and Engineer, along with the General Contractor and each of the subcontractors shall conduct a final inspection jointly for "punch list" purposes and to determine the exact status of the project before final acceptance.

3.04 GUARANTEES

A. The Contractor shall take notice of special guarantees required in the technical Sections of these Specifications.
   1. If, in the opinion of the Owner, any item requires excessive maintenance during guarantee periods, the item shall be considered defective and the Contractor shall correct the defects.
   2. All defects so corrected shall be at the expense of the Contractor.

END OF SECTION

SECTION 01710
CLEANING

PART 1 GENERAL

1.01 SCOPE

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 to 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

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, or utilize a site designated by the Owner.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS AND EQUIPMENT

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

2.02 COMPATIBILITY

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 PM/CM.

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. Daily, 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 PM/CM.

C. Structures

1. Weekly, and more often if necessary, inspect the structures and pick up all scrap,

debris and waste material. Remove all such items to the place designated for their storage.

2. Weekly, and more often if necessary, sweep all interior spaces clean. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by using a hand-held broom.

3. As required preparatory to installation of successive materials, clean the structures or pertinent portions as recommended by the manufacturer of the successive material.

4. Following the installation of finish floor materials, clean the finish floor daily. "Clean", for the purpose of this paragraph, shall be interpreted as meaning free from all foreign material which, in the opinion of the PM/CM, may be injurious to the finish floor material.

5. Schedule cleaning operation so that dust and other contaminants resulting from cleaning operations will not fall on wet, recently painted surfaces.

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 PM/CM, hose down 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. Structures

1. Remove all traces of soil, waste material, splashed material, and other foreign matter to provide a uniform degree of exterior cleanliness. Visually inspect all exterior surfaces and remove all traces of soil, waste material, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. If necessary to achieve a uniform degree of exterior cleanliness, hose down the exterior of the structure. In the event of stubborn stains not removable with water, the PM/CM may require light sandblasting or other cleaning at no additional cost to the Owner.

2. Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges and other foreign matter. Remove all paint droppings, spots, stains and dirt from finished surfaces.
3. Clean all glass inside and outside.

4. Polish all surfaces requiring the routine application of buffed polish. Provide and apply polish as recommended by the manufacturer of the material being polished.

E. 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, shall be removed as directed by the PM/CM.

F. 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 PM/CM will decide what method of restoration shall be used.

G. Timing: Schedule final cleaning as approved by the PM/CM 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 PM/CM in accordance with the Supplementary Conditions of the Contract Documents.

END OF SECTION

SECTION 01720
PRODUCT HANDLING

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.

1.02 QUALITY ASSURANCE

A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.03 MANUFACTURER'S RECOMMENDATIONS

A. Comply with manufacturers' recommendations on product handling, storage and protection.

1.04 PACKAGING

A. Deliver products to the job site in their manufacturer's original container(s), with labels intact and legible.
   1. Maintain packaged materials with seals unbroken and labels intact until time of use.
   2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.

B. The Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Engineer as to manufacturer, grade, quality and other pertinent information.

1.05 PROTECTION

A. Mechanical equipment subject to damage by the atmosphere if stored outdoors, shall be stored in a building with a controlled environment. The building may be a temporary structure on the site or a building off the site.

B. PVC pipe shall be covered to protect it from UV degradation.

1.06 REPAIRS AND REPLACEMENTS

A. In event of damage, promptly make replacements and repairs to the approval of the Engineer at no additional cost to the Owner.

B. Additional time required to secure replacements and to make repairs will not be considered by the Engineer to justify an extension in the Contract Time of Completion.

END OF SECTION

SECTION 01730
PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SCOPE

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

B. Maintain at the site for the Owner one record copy of:

1. Drawings,
2. Specifications,
3. Change orders and other modifications to the Contract,
4. Engineer field orders or written instructions,
5. Reviewed shop drawings, product data and samples,
6. Field test records.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Storage

1. Store documents and samples 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.

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

1.03 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.

C. Drawings: Record (or As-built) CADD drawings shall be as required per Rockdale Water and Wastewater Standards and Specifications Section 1.04. The Caddd files need to be in state plane coordinates

Include the following:

1. Depths of various elements of foundation in relation to finish first floor datum.
2. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements(Rim and inverte elevations).
3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
4. Field changes of dimension and detail.
5. Changes made by Requests for Information (RFI), field order or by change order.
6. Details not on original Contract Drawings.

D. Specifications: 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 or by change order.

E. New sewer must be televised per Rockdale County Water and Sewer Standards. The contractor must submit the CCTV database compatible with Granite Software.

1.04 SUBMITTAL

A. At Contract closeout, deliver record documents to Engineer for the Owner.

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

1. Date,
2. Project title and number,
3. Contractor's name and address,
4. Title and number of each record document,
5. Signature of Contractor or Contractor's authorized representative.

END OF SECTION

SECTION 01740
PROJECT WARRANTIES AND BONDS

1 GENERAL

1.1 PROJECT MAINTENANCE AND WARRANTY

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

B. The CONTRACTOR shall warrant for a period of one year, or for the period as specified in the technical specifications of these Contract Documents, from the date of OWNER's written acceptance of the Work, or portions of the Work, as defined in the Contract Documents, 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. 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.

** END OF SECTION **

SECTION 02100
EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SCOPE

A. Submittals and Permits

1. The Designer shall prepare a description, drawings and schedule for proposed temporary and permanent erosion and sedimentation controls. The description and drawings shall meet the requirements of the Georgia Erosion and Sedimentation Act of 1975 as amended in 1989 and local soil erosion and sedimentation control ordinances. The Owner will acquire Land Disturbance Permits from the appropriate authority and shall pay any fees for said permits. All fines imposed for improper erosion and the Contractor shall pay sedimentation control.

2. Land disturbance activity shall not commence until the Land Disturbance Permit is issued.

B. Basic Principles

1. Conduct the earthwork and excavation activities in such a manner to fit the topography, soil type and condition.

2. Minimize the disturbed area and the duration of exposure to erosion elements.

3. Stabilize disturbed areas immediately.

4. Safely convey run-off from the site to an outlet such that erosion will not be increased off site.

5. Retain sediment on site that was generated on site.

6. Minimize encroachment upon watercourses.

C. Implementation

1. The Contractor is solely responsible for the control of erosion within the Project site and the prevention of sedimentation from leaving the Project site or entering waterways.

2. The Contractor shall install temporary and permanent erosion and sedimentation controls, which will ensure that runoff from the disturbed area of the Project site, shall pass through a filter system before exiting the Projectsite.

3. The Contractor shall provide temporary and permanent erosion and sedimentation control measures to prevent silt and sediment form entering the waterways.
4. The Contractor shall limit land disturbance activity to those areas shown on the Drawings.

5. The Contractor shall maintain the disturbed area on the entire site until acceptance of the Project at no additional cost to the Owner. Maintenance shall include mulching, re-seeding, clean-out of sediment barriers and sediment ponds, replacement of washed-out or undermined rip rap and erosion control materials, to the satisfaction of the Engineer.

6. All fines imposed for improper erosion and the Contractor shall pay sedimentation control.

D. Temporary Erosion and Sedimentation Control: In general, temporary erosion and sedimentation control procedures shall be directed toward:

1. Preventing soil erosion at the source.

2. Preventing silt and sediment from entering any waterway if soil erosion cannot be prevented.

3. Preventing silt and sediment from migrating downstream in the event it cannot be prevented from entering the waterway.

E. Permanent Erosion Control: Permanent erosion control measures shall be implemented to prevent sedimentation of the waterways and to prevent erosion of the Project site.

1.02 QUALITY ASSURANCE

A. General: Perform all work under this Section in accordance with all pertinent rules and regulations including, but not necessarily limited to, those stated herein and these Specifications.

B. Conflicts: Where provisions of pertinent rules and regulations conflict with these Specifications, the more stringent provisions shall govern.

PART 2 PRODUCTS

2.01 TEMPORARY EROSION AND SEDIMENTATION CONTROL MATERIALS

A. Silt Fence: Silt fence shall meet the requirements of Section 171 - Temporary Silt Fence of the Department of Transportation, State of Georgia, Standard Specification, latest edition. Silt fence fabric must be on the Georgia DOT Qualified Product List.

B. Hay bales shall be clean, seed free cereal hay type.

C. Netting shall be 1/2-inch, galvanized steel, chicken wire mesh.

D. Filter stone shall be crushed stone conforming to Georgia Department of Transportation Table 800.01H, Size Number 3.

PART 3 EXECUTION

3.01 GENERAL

Standards: Provide all materials and promptly take all actions necessary to achieve effective erosion and sedimentation control in accordance with the Georgia Erosion and Sedimentation Act of 1975 as amended in 1989, local enforcing agency guidelines and these Specifications.

3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Temporary erosion and sedimentation control procedures should be initially directed toward preventing silt and sediment from entering the creeks. The preferred method is to provide an undisturbed natural buffer, extending a minimal 25 feet from the top of the bank, to filter the run-off. Should this buffer prove infeasible due to construction activities being too close to the creek, or if the amount of sediment overwhelms the buffer, the Contractor shall place silt fences to filter the run-off and, ifnecessary, place

permanent rip rap to stabilize the creek banks. When excavation activities disturb the previously stated preventative measures, or if they are not maintained, or whenever the construction activities cross the creeks, the check dams shall be installed downstream and within 200 feet of the affected area.

B. Silt dams, silt fences, traps, barriers, check dams, appurtenances and other temporary measures and devices shall be installed as indicated on the approved plans and working drawings, shall be maintained until no longer needed, and shall then be removed. Deteriorated hay bales and dislodged filter stone shall be replaced with new materials.

C. Where permanent grassing is not appropriate, and where the Contractor's temporary erosion and sedimentation control practices are inadequate, the Engineer may direct the Contractor to provide temporary vegetative cover with fast growing seedlings. Such temporary vegetative cover shall be provided by the Contractor in compliance with the Manual for Erosion and Sedimentation Control in Georgia, specifically in the selection of species, planting dates and application rates for seeding, fertilizer and mulching, with the exception that kudzu shall not be permitted.

D. All erosion and sedimentation control devices, including check dams, shall be inspected by the Contractor at least daily and after each rainfall occurrence and cleaned out and repaired by the Contractor as necessary.

E. Temporary erosion and sedimentation control devices shall be installed and maintained from the initial land disturbance activity until the satisfactory completion and establishment of permanent erosion control measures. At that time, temporary devices shall be removed.

3.03 PERMANENT EROSION CONTROL

A. Permanent erosion control shall include:

1. Restoring the work site to its original contours, unless shown otherwise on the Drawings or directed by the Engineer.

2. Permanent vegetative cover shall be performed in accordance with Article 3.04 of this Section and Section 02936 of these Specifications.

3. Permanent stabilization of steep slopes and creeks shall be performed in accordance with Article 3.05 of this Section.

B. Permanent erosion control measures shall be implemented as soon as practical after the completion of pipe installation or land disturbance for each segment of the Project. In no event shall implementation be postponed when no further construction activities will impact that portion or segment of the Project. Partial payment requests may be withheld for those portions of the Project not complying with this requirement.

3.04 GRASSING

A. General

1. All references to grassing, unless noted otherwise, shall relate to establishing permanent vegetative cover.

2. When final grade has been established, all bare soil, unless otherwise required by the Contract Documents, shall be seeded, fertilized and mulched in an effort to restore to a protected condition. Critical areas shall be sodded as approved or directed by the Engineer.

3. Specified permanent grassing shall be performed at the first appropriate season following establishment of final grading in each section of the site.

4. Permanent grassing shall be of a perennial species.

B. Replant grass removed or damaged in residential areas using the same variety of grass and at the first appropriate season. Where sod is removed or damaged, replant such areas using sod of the same species of grass at the first appropriate season. Outside of residential or landscaped areas, grass the entire area disturbed by the work on completion of work in any area. In all areas, promptly establish successful stands of grass.

C. Where permanent vegetative cover (grassing) cannot be immediately established (due to season or other circumstances) the Contractor shall provide temporary vegetative cover. The Contractor must return to the site (at the appropriate season) to install permanent vegetation in areas that have received temporary vegetative cover.

END OF SECTION 02100

SECTION 02110
CLEARING AND GRUBBING

PART 1 GENERAL

1.1 DESCRIPTION

A. Work included: Clear and grub to the limits required by the Contract Documents. Clear and grub the areas to be occupied by the facilities to be constructed including all areas to be excavated, filled, paved or planted as shown on the Drawings and as specified herein.

1.2 RELATED WORK

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.3 DEFINITIONS

A. Clearing: Clearing shall consist of the cutting and felling of trees and vegetation as per Section 3.03 of this Technical Specification and the satisfactory disposal of trees, limbs, rubbish, structures and other vegetation.

B. Grubbing: Grubbing shall consist of the removal and disposal of roots, root mat, stumps, logs, footings, slabs, and other objectionable matter which could affect the quality of the subgrade or borrow material.

C. Topsoil: Topsoil material is defined in Section 02210 - Site Grading.

D. Disposal: Disposal of cleared and grubbed material shall be performed as indicated in 3.5 of this Technical Specification.

1.4 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

1.5 COORDINATION

A. Coordinate clearing and grubbing of the easements with the Owner.

1. Obtain permission if working outside of the easement lines.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Flag limits of clearing.

3.2 PROTECTION

A. Only trees and brush within the limits of the easement shall be cleared.

1. Protect trees and shrubs, where indicated to remain, by providing a fence around the tree or shrub at its drip line and of sufficient height so trees and shrubs will not be damaged.
2. All areas not designated to be cleared shall be protected from damage.
3. Clearing operations shall be conducted so that cut trees are felled within the easement boundaries and existing trees designated to remain, are protected from damage.
4. Protect control points, benchmarks and existing work.
5. Maintain access to the site at all times.

3.3 CLEARING AND GRUBBING

A. Within the area to be cleared:

1. Fell trees and brush.
2. Chip all wood and waste.
3. Grub out all roots 1 inch in diameter and larger to a depth of at least 12 inches below the existing ground surface.
4. Remove all stumps and other matter that cannot be removed by a root rake. Remove stumps to a minimum depth of 2 ft. below grade.

3.4 CONSERVATION OF TOPSOIL

A. After the area has been cleared of vegetation, strip the existing top-soil.

1. Stockpile in an area clear of new construction.
2. Maintain the stockpile in a manner which will not obstruct the natural flow of drainage.
   a. Maintain stockpile free from debris and trash.
   b. Keep top-soil damp to prevent dust.
   c. Place hay bales around stockpile.

3.5 REMOVAL AND DISPOSAL

A. All debris, wood waste, trees, shrubs, brush, roots, stumps and etc. cleared and grubbed from the site shall be removed from the site and disposed of in accordance with Federal, State, and local codes.

1. Burning and/or burial of cleared and grubbed material on the site shall not be permitted.
2. Depressions remaining from the removal of stumps below finish grade shall be backfilled with compacted fill to the approximate density of the surrounding soil.

3.6 UTILITIES

A. Protect existing utilities indicated or made known.
   1. Coordinate with utility companies and agencies as required.

END OF SECTION

SECTION 02160
SUPPORT OF EXCAVATION

PART 1 GENERAL

1.1 DESCRIPTION

1. Provide excavation support as required by the Contract Documents.

    1. In general this work shall consist of furnishing and placing timber and/or steel sheeting and shoring of the types and dimensions required for proper excavation support.

1.2 DEFINITIONS

1. Shoring shall mean the use of a steel trench box, steel sheeting, or timber sheeting braced as required.

2. Timber sheeting shall mean the use of tongue and groove wood sheeting or steel soldier beams with wood lagging braced as required.

3. Steel sheeting shall mean the use of steel sheet pilings with interlocking joints, braced by steel members as required.

1.3 RELATED WORK

1. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

B. As established in the General Conditions of the Contract, the Contractor is solely responsible for means and methods of construction and for the sequence and procedures to be used.

1.4 QUALITY ASSURANCE

1. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

A. The Contractor shall not perform excavations in unstable ground and shall employ a positive means of containing the unstable ground behind shoring, before excavation may proceed.

2. Employ a qualified professional engineer, properly permitted to provide such services at the location of the work, to design the shoring system and to inspect and report on the quality of its construction.

3. Comply with all pertinent requirements of governmental agencies having jurisdiction.

1.5 STANDARDS

1. The following Standards form a part of this Specification as referenced:

    1. ASTM A328, Specification for Steel Sheet Piling
    2. State of Georgia DOT Standard Specifications.
    3. Code of Federal Regulations (CFR), 29 CFR 1926, OSHA Standards - Excavation.

1.6 SUBMITTALS

1. Submit shoring design to Engineer for record purposes only.

PART 2 PRODUCTS

2.1 DESIGN

A. Design a shoring system which will safely and adequately prevent collapse of adjacent materials and which will permit construction of the Work to the arrangement shown on the Drawings.

B. All shoring systems shall be designed so as to support all vertical and lateral loads and other surcharge loads imposed on the system during construction, including earth pressures, utility loads and other surcharged loads in order to provide safe and expeditious construction of the permanent structures and prevent movement and/or damage to adjacent soil, buildings, structures and utilities.

C. Secure all needed approvals, including those of governmental agencies having j jurisdiction and of adjacent property owners if required, at no additional cost to the Owner.

2.2 MATERIALS

A. Material shall include, but not necessarily be limited to sheet piling, solder piles, lagging, bracing members such as wales, struts, shores and tieback anchors.

B. Lumber for Timber Sheeting and Shoring.

1. Shall be sound Spruce, Douglas Fir, white or yellow Lodgepole, Ponderosa pine, or western hemlock plank, planed on one side and either tongue and grooved or splined.

C. Steel Sheeting

1. Shall be of approved section and quality, either new or secondhand, conforming to the requirements of ASTM A328.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Construct and install the shoring system in strict accordance with the design engineer's requirements.

1. When using soldier piles and lagging, where boulders or cobbles are encountered, soldier piles shall be installed in pre-augured holes over the full depth as required to prevent misalignment and damage.

2. Vibration monitoring during installation and extraction of braced excavation shall be provided wherever the excavation is within 100 feet of existing structures.

3.3 SHEETING REMOVED

A. All sheeting not left in place shall be carefully removed in such manner as to not endanger the construction or other structures, utilities, or property.

1. All voids left or caused by withdrawal shall be immediately refilled with approved material, and compacted with tools especially adapted to that purpose.

2. Vibratory extraction methods shall be used only when it can be demonstrated that settling of pipe and structures will not occur. If such settling occurs, it shall be corrected at the Contractor's expense.

3.4 TRENCH BOX OR SHIELD

A. Use of a trench box or shield shall not relieve the Contractor of any liability for damages to persons or property growing out of a failure of the Contractor to leave in place sufficient sheeting and bracing to prevent the caving or moving of the ground or disturbance of the completed work.

1. Care shall be taken, when a trench box or shield is moved ahead, so as not to pull apart the joints of pipe already placed or leave voids around the pipe wall.

2. At no time shall the portable box or shield be allowed to be positioned below the spring line of the pipe.

3. The width of the trench box or shield shall be such that a minimum 6 inch horizontal clearance is maintained between the pipe and shield at all times. The minimum width of the trench shall be in accordance with plans and specifications.

4. If the pipe has moved, it shall be reset to the proper line and grade.

5. Any voids between the trench box or shield and the undisturbed trench wall within the pipe zone (bottom of trench to top of cover material) shall be filled with crushed stone, bank run gravel, or approved material, immediately after the box or shield is positioned.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

1. Work included: Remove all rock encountered while excavating for structures, utility trenches as required by the Contract Documents.

1.2 RELATED WORK

1. Documents affecting the work of this Section include, but are not necessarily General Conditions, Supplementary Conditions and Sections in Division 1 specifications.

1.3 DEFINITIONS

General Excavation: Any material occupying an original volume of more than 1 cubic yard which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rating of not less than 80,000 lbs. usable pull (Caterpillar D-8 or larger), and that requires explosives, wedging or impact hammer removal.

Trench Excavation: Any material occupying an original volume of more than 1/2 cubic yard which cannot be excavated with a backhoe having a bucket curling force rated at not less than 40,000 lbs., using a rock bucket and rock teeth (John Deere 790 or larger), and that requires explosives, wedging or impact hammer removal.

1.4 STANDARDS

1. All handling of explosives and blasting shall be in compliance with Georgia Rules and Regulations for Explosives and Blasting Agents promulgated and adopted by the Georgia Safety Fire Commissioner as contemplated by and pursuant to authority set forth in O.C.G.A. Sections 25-2-4, 25-2-17, and 25-8-9.

1.5 QUALITY ASSURANCE.

1. Use adequate numbers of skilled workmen who are thoroughly trained and experienced the necessary crafts and who are completely familiar with the specified required the methods needed for proper performance of the work of this section.

2. Comply with all pertinent requirements of governmental agencies having jurisdiction

1.6 SUBMITTALS

1. Submit plans for proposed pre-blast survey (Record purposes only).

2. Submit Copy of Blasting Licenses and Permits

3. Submit Conceptual Blasting Plan at least 30 days prior to start of blasting including but not limited to:

   General blasting methods that are expected to be used for rock excavation Description of blasting techniques as well as techniques to control noise, blasting vibrations, air-overpressures, and fly rock. Include detailed specifications of blasting mats and how they will be safely placed to cover all blasts.

   Blast monitoring plan to monitor peak ground vibration and air-overpressure. Minimum trigger levels for monitoring shall be 0.05 in/s for ground motion and 120 dB for air-overpressure. Trigger levels may be adjusted to higher levels if authorized by Owners' representative.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.5 NOTIFICATION

A. When rock is encountered, it shall be uncovered and the Engineer notified.

1. The Contractor shall provide the Engineer with cross sections of the rock surface or a profile of the rock where trenches are concerned.

2. The Engineer shall be present when the cross sections or profiles are taken.

3. The average end area method shall be used in computing the volumes wherever practicable.

3.6 LIMITS OF EXCAVATION IN ROCK

A. Excavation in rock shall be performed, so that no projection shall come within vertical planes twelve (12) inches outside of the structure being built or twelve (12) inches below the bottom of the structure base slab and footings.

B. In trenches, the rock shall be removed to the limits shown on the typical trench section.

1. Where excavation is carried beyond the above determined limits, the additional space shall be refilled at the Contractor's expense with concrete or other specified materials as per Rockdale County Specifications.

3.7 BLASTING

A. All Blasters-in-charge shall be properly licensed and have a minimum of ten years of construction blasting experience at projects with similar scope and complexity. All blasting plans, test blasting plans and revisions shall be prepared by or reviewed by and covered with a signed review letter by the blasting consultant. The blasting consultant will not be required to sign the individual blast plans provided they are signed by an on-site licensed blaster. The Blasting Consultant must not be an employee of any Contractors or associated companies of Contractors involved in the work.

B. When explosives are delivered to the work sites, they must not be unloaded from delivery vehicles until a responsible blaster-in-charge has signed the delivery paperwork and assumes full authority and responsibility for the security of the explosive materials. Unused explosive materials must be similarly signed over to a properly licensed driver with a Commercial Drivers' License with a Hazmat endorsement before explosive materials are loaded onto a fully-DOT-compliant vehicle for removal from the site.

C. Take all precautions necessary to warn and/or protect any individuals exposed to his operations. Such precautions shall include but not be restricted to the following:

1. Present written certificate of insurance showing evidence that his insurance includes coverage for blasting operations, before doing any blasting work.

2. Make necessary arrangements as may be required by the applicable Federal, State, County or Municipal codes, rules, regulations and laws, and shall be responsible for compliance.

3. Obtain a permit from the local authorities to perform blasting operations.
   i. The Engineer shall be notified in writing that such permit has been obtained.

4. Schedules for blasting shall be thoroughly coordinated with the proper authorities – Federal, State and Local.
   a. No blasting shall be done unless the Contractor has notified all concerned parties that he may blast.
   b. The Contractor shall also notify any commercial installation in the immediate area whose operations or instrumentation may be affected by blasting, at least twenty four (24) hours prior to blasting operations.

5. Seismographic recordings shall be made of all blasting operations on the project by a qualified testing agency hired and coordinated by the Contractor.

   a. A copy of these recordings shall be made available to the Engineer.
   b. The Contractor shall provide a minimum of six seismographs for monitoring peak ground vibration and air-overpressure at any given time during blasting. The equipment and its use shall conform fully to the standards developed by the Vibration Section of the International Society of Explosive Engineers (ISEE).
   c. The Peak Particle Velocity (PPV) limits shall not exceed:
      i. 5.0 in/s at ground above buried utilities
      ii. 0.5 in/s at residential structures
      iii. 2.0 in/s at buildings and facilities
   d. The maximum charge-per-delay for all blasts shall not exceed 100 pounds.
   e. Intensity of air-overpressure at any off-site structures shall not exceed 133 decibels (0.01295 psi)

6. Blasting shall be performed by persons who are licensed to use explosives.

7. The Contractor shall keep an accurate record of each blast and submit a copy to the Engineer. The record shall show the date, time, exact stationing of the blast, the depth and number of drill holes, and kind and quantity of explosive used, peak particle velocity, air-overpressure and any other data required for a complete record.

8. The Contractor shall be fully responsible for damages caused by his blasting operations.

9. At the start of blasting, perform at least two test blasts to establish that rock movement is adequately controlled and intensities of specified ground motion and air-overpressure are in conformance with specified levels. The scaled

distance to the nearest residential property for the test blast must be 75 or greater.

10. If rock below the limits of excavation is shattered by blasting, caused by holes drilled to deep, too heavy a charge of explosives or any other circumstance due to blasting, the shattered rock shall be removed and the void refilled with gravel borrow (gravel bedding, screened gravel, crushed stone or filter gravel) at the expense of the Contractor.

3.8 DISPOSAL AND REPLACING OF ROCK

A. Remove and dispose of all pieces of rock which are not suitable for use in other parts of the Work.

1. Rock disposed of by hauling away to spoil areas shall be replaced by surplus excavation obtained elsewhere on the site, insofar as it is available.

B. Fragments of rock approximately twenty five (25) pounds or less may be used in the common fill areas of the site as approved by the Engineer.

1. The Contractor shall place these pieces of rock in thin layers alternating them with layers of earth to be sure that all voids between the rocks are completely filled with earth.
2. If in the opinion of the Engineer the quantity is excessive, he may order the removal and disposal of the rock.

C. Be responsible for obtaining spoil locations and the removal of all excess rock from the site.

END OF SECTION

PART 1 GENERAL

1.01 SCOPE

The work to be performed under this Section shall consist of removing and replacing existing pavement, sidewalks and curbs in paved areas where such have been removed for construction of sewers, manholes and all other sewer appurtenances and structures.

1.02 SUBMITTALS

A. Provide certificates stating that materials supplied comply with Specifications. The asphalt producer and the Contractor shall sign certificates.

B. Traffic paint manufacturer's application instructions and a description and other data relative to the Contractor's application equipment and methods shall be submitted to the Engineer for approval.

1.03 CONDITIONS

A. Weather Limitations

1. Apply bituminous prime and tack coats only when the ambient temperature in the shade has been at least 50 degrees F for 12 hours immediately prior to application.

2. Do not conduct paving operations when surface is wet or contains excess of moisture, which would prevent uniform distribution and required penetration.

3. Construct asphaltic courses only when atmospheric temperature in the shade is above 40 degrees F, when the underlying base is dry and when weather is not rainy.

4. Place base course when air temperature is above 35 degrees F andrising.

B. Grade Control: Establish and maintain the required lines and grades for each course during construction operations.

PART 2 PRODUCTS

2.01 MATERIALS AND CONSTRUCTION

A. Graded Aggregate Base Course: Graded aggregate base course shall be of uniform quality throughout and shall meet the requirements of Section 815.01 of the Georgia Department of Transportation Standard Specifications.

B. Black Base: Black base course shall be of uniform quality throughout and shall conform to the requirements of Section 828 of the Georgia Department of Transportation Standard Specifications.

C. Binder Course: The binder course of all paved roadways shall conform to the requirements of Section 400, Type "B" of the Georgia Department of Transportation Standard Specifications.

D. Surface Course: The surface course for all pavements, including prime or tack coat when required by the Engineer, shall conform to the requirements of Section 400, Type "F" of the Georgia Department of Transportation Standard Specifications.

E. Concrete: Provide concrete and reinforcing for concrete pavement or base courses in accordance with the requirements of the Georgia Department of Transportation Standard Specifications, Section 430. Concrete shall be of the strength classifications shown in Section 02730 of these Specifications.

F. Special Surfaces: Where driveways or roadways are disturbed or damaged which are constructed of specialty type surfaces, e.g., brick, stone or decorative sidewalks, these driveways and sidewalks shall be restored utilizing similar, if not original, materials. A specialty contractor shall be used to restore the surfaces to their previous or better condition. Special surfaces shall be removed and replaced to the limits to which they were disturbed.

2.02 TYPES OF PAVEMENTS

A. General: All existing pavement removed, destroyed or damaged by construction shall be replaced with the same type and thickness of pavement as that existing prior to construction, unless otherwise directed by the Engineer. Materials, equipment and construction methods used for paving work shall conform to the Georgia Department of Transportation specifications applicable to the particular type required for replacement, repair or new pavements.

B. Aggregate Base: Aggregate base shall be constructed in accordance with the requirements of Section 310 of the Georgia Department of Transportation Standard Specifications. The maximum thickness to be laid in a single course shall be 6-inches compacted. If the design thickness of the base is more than 6-inches, it shall be constructed in two or more courses of approximate equal thickness. After the material placed has been shaped to line, grade and cross-section, it shall be rolled until the course has been uniformly compacted to at least 100 percent of the maximum dry density when Group 2 aggregate is used, or to at least 98 percent of maximum dry density when Group 1 aggregate is used.

C. Concrete Pavement: Concrete pavement or base courses shall be replaced with concrete. The surface finish of the replaced concrete pavement shall conform to that of the existing pavement. The surface of the replaced concrete base course shall be left rough. The slab depth shall be equivalent to the existing concrete pavement or base course, but in no case less than 6-inches thick. Transverse and longitudinal joints removed from concrete pavement shall be replaced at the same locations and to the same types and dimensions as those removed. Concrete pavements or concrete base courses shall be reinforced.

D. Asphaltic Concrete Base, Binder and Surface Course: Asphaltic concrete base, binder and surface course construction shall conform to Georgia Department of Transportation Standard Specifications, Section 400. The pavement mixture shall not be spread until the designated surface has been previously cleaned and prepared, is intact, firm, properly cured, and dry and the tack coat has been applied. Apply and compact the base in maximum layer thickness by asphalt spreader equipment of design and operation approved by the Engineer. After compaction, the black base shall be smooth and true to established profiles and sections. Apply and compact binder and the surface course in a manner approved by the Engineer. Immediately correct any high, low or defective areas by cutting out the course, replacing with fresh hot mix, and immediately compacting to conform and thoroughly bond to the surrounding area.

E. Surface Treatment Pavement: Bituminous penetration surface treatment pavement shall be replaced with a minimum thickness of 1-inch conforming to Section 424, Georgia Department of Transportation Standard Specifications.

F. Temporary Measures: During the time period between pavement removal and complete replacement of permanent pavement, maintain highways, streets and roadways by the use of steel running plates anchored to prevent movement. The backfill above the pipe shall be compacted, up to the existing pavement surface to

provide support for the steel running plates. All pavement shall be replaced within seven calendar days of its removal.

PART 3 EXECUTION

3.01 REMOVING PAVEMENT

A. General: Remove existing pavement as necessary for installing the pipe line and appurtenances.

B. Marking: Before removing any pavement, mark the pavement neatly paralleling pipe lines and existing street lines. Space the marks the width of the trench.

C. Breaking: Break asphalt pavement along the marks using pavement shearing equipment, jack hammers or other suitable tools. Break concrete pavement along the marks by scoring with a rotary saw and breaking below the score by the use of jack hammers or other suitable tools.

D. Machine Pulling: Do not pull pavement with machines until the pavement is completely broken and separated from pavement to remain.

E. Damage to Adjacent Pavement: Do not disturb or damage the adjacent pavement. If the adjacent pavement is disturbed or damaged, remove and replace the damaged pavement.

F. Sidewalk: Remove and replace any sidewalks disturbed by construction for their full width and to the nearest undisturbed joint.

G. Curbs: Tunnel under or remove and replace any curb disturbed by construction to the nearest undisturbed joint.

3.02 REPLACING PAVEMENT

A. Preparation of Subgrade: Upon completion of backfilling and compaction of the backfill, arrange to have the compaction tested by an independent testing laboratory selected by the Owner. After compaction testing has been satisfactorily completed, replace all pavements, sidewalks and curbs removed.

1. The existing street pavement or surface shall be removed along the lines of the work for the allowable width specified for the trench or structure. After the installation of the sewerage or water works facilities and after the backfill has

been compacted suitably, the additional width of pavement to be removed, as shown on the Drawings, shall be done immediately prior to replacing the pavement.

2. Trench backfill shall be compacted for the full depth of the trench as specified.

3. Temporary trench backfill along streets and driveways shall include 6-inches of crushed stone or cherty clay as a temporary surfacing of the trenches. The Contractor shall maintain this temporary surface carefully at grade and dust-free until the backfill of the trench has thoroughly compacted in the opinion of the Owner and permission is granted to replace the street pavement.

4. When temporary crushed stone or chert surface is considered by the Owner to be sufficient surface for gravel pavement, the surface shall be graded smooth and to an elevation that will make the final permanent surfacing level with the adjacent surfacing that was undisturbed.

B. Pavement Replacement

1. Prior to replacing pavement, make a final cut in concrete pavement 12-inches back from the edge of the damaged pavement with a concrete saw. Remove asphalt pavement 12-inches back from the edge of the damaged pavement using pavement shearing equipment, jack hammers or other suitable tools.

2. Replace all street and roadway pavement as shown on the Drawings. Replace driveways, sidewalks and curbs with the same material, to nearest existing undisturbed construction joint and to the same dimensions as those existing.

3. If the temporary crushed stone or chert surface is to be replaced, the top 6-inches shall be removed and the crushed stone surfacing for unpaved streets or the base for the bituminous surface shall be placed.

4. Following this preparation, the chert or crushed stone base shall be primed with a suitable bituminous material and surfaced with the proper type of bituminous surface treatment.

5. Where the paved surface is to be replaced with asphaltic concrete pavement, concrete pavement or with a concrete base and a surface course, the temporary chert or crushed stone surface and any necessary backfill material, additional

existing paving and new excavation shall be removed to the depth and width shown on the Drawings. All edges of the existing pavement shall be cut to a straight, vertical edge. Care shall be used to get a smooth joint between the old and new pavement and to produce an even surface on the completed street. Expansion joints, where applicable, shall be replaced in a manner equal to the original joint.

6. Where driveways or roadways, constructed of specialty type surfaces, e.g., brick, stone or decorated sidewalks are disturbed or damaged, these driveways, roadways or sidewalks shall be restored utilizing similar materials. A specialty contractor shall be used to restore the surfaces to their previous or better condition. Special surfaces shall be removed and replaced to the limits to which they were disturbed.

D. Pavement Striping: Pavement striping removed or paved over shall be replaced with the same type, dimension and material as original unless directed otherwise by the Engineer.

3.03 SIDEWALK AND CURB REPLACEMENT

A. Construction

1. All concrete sidewalks and curbs shall be replaced with concrete.

2. Preformed joints shall be 1/2-inch thick, conforming to the latest edition of AASHTO M59 for sidewalks and AASHTO M 123 for curbs.

3. Forms for sidewalks shall be of wood or metal, shall be straight and free from warp, and shall be of sufficient strength, when in place, to hold the concrete true to line and grade without springing or distorting.

4. Forms for curbs shall be metal and of an approved section. They shall be straight and free from distortions, showing no vertical variation greater than 1/8-inch in 10 feet and no lateral variation greater than 1/4-inch in 10 feet from the true plain surface on the vertical face of the form. Forms shall be of the full depth of the structure and constructed such to permit the inside forms to be securely fastened to the outside forms.

5. Securely hold forms in place true to the lines and grades.

6. Wood forms may be used on sharp turns and for special sections, as approved by the Owner. Where wooden forms are used, they shall be free from warp and shall be the nominal depth of the structure.

7. All mortar and dirt shall be removed from forms and all forms shall be thoroughly oiled or wetted before any concrete is deposited

B. When a section is removed, the existing sidewalk or curb shall be cut to a neat line, perpendicular to both the centerline and the surface of the concrete slab. Existing concrete shall be cut along the nearest existing construction joints.

C. Existing concrete sidewalks and curbs that have been cut and removed for construction purposes shall be replaced with the same width and surface as the portion removed. Sidewalks shall have a minimum uniform thickness of 4-inches. The new work shall be neatly jointed to the existing concrete so that the surface of the new work shall form an even, unbroken plane with the existing surfaces.

D. The subgrade shall be formed by excavating to a depth equal to the thickness of the concrete, plus 2-inches. Subgrade shall be of such width as to permit the proper installation and bracing of the forms. Subgrades shall be compacted by hand tamping or rolling. Soft, yielding or unstable material shall be removed and backfilled with satisfactory material. Place 2-inches of porous crushed stone under all sidewalks and curbs and compacted thoroughly, then finish to a smooth, unyielding surface at proper line, grade and cross section.

E. Joint for Curbs

1. Joints shall be constructed as indicated on the Drawings and as specified. Construct joints true to line with their faces perpendicular to the surface of the structure and within 1/4-inch of their designated position.

2. Thoroughly spade and compact the concrete at the faces of all joints filling all voids.

3. Install expansion joint materials at the point of curve at all street returns. Install expansion joint material behind the curb at abutment to sidewalks and adjacent structures.

4. Place contraction joints every 10 feet along the length of the curbs and gutters. Form contraction joints using steel templates or division plates, which conform to

the cross section of the structure. Leave the templates in place until the concrete has set sufficiently to hold its shape, but remove them while the forms are still in place. Contraction joint templates or plates shall not extend below the top of the steel reinforcement or they shall be notched to permit the reinforcement to be continuous through the joint. Contraction joints shall be a minimum of 1-1/2-inches deep.

F. Expansion joints shall be required to replace any removed expansion joints or in new construction wherever shown on the Drawings. Expansion joints shall be true and even, shall present a satisfactory appearance, and shall extend to within 1/2-inch of the top of finished concrete surface.

G. Finishing

1. Strike off the surface with a template and finish the surface with a wood float using heavy pressure, after which, contraction joints shall be made and the surface finished with a wood float or steel trowel.

2. Finish the face of the curbs at the top and bottom with an approved finishing tool.

3. Finish edges with an approved finishing tool having a 1/4-inch radius.

4. Provide a final broom finish by lightly combing with a stiff broom after troweling is complete.

5. The finished surface shall not vary more than 1/8-inch in 10 feet from the established grade.

H. Driveway and Sidewalk Ramp Openings

1. Provide driveway openings of the widths and at the locations indicated on the Drawings and as directed by the Owner.

2. Provide sidewalk ramp openings as indicated on the Drawings, in conformance with the applicable regulations and as directed by the Owner.

I. Concrete shall be suitably protected from freezing and excessive heat. It shall be kept covered with burlap or other suitable material and kept wet until cured. Provide necessary barricades to protect the work. All damage caused by people, vehicles,

animals, rain, the Contractor's operations and the Contractor, at no additional expense to the Owner, shall repair the like.

3.04 MAINTENANCE

The Contractor shall maintain the surfaces of roadways built and pavements replaced until the acceptance of the Project. Maintenance shall include replacement, scraping, reshaping, wetting and rerolling as necessary to prevent raveling of the road material, the preservation of reasonably smooth surfaces and the repair of damaged or unsatisfactory surfaces, to the satisfaction of the Engineer. Maintenance shall include sprinkling as may be necessary to abate dust from the gravel surfaces.

3.05 SUPERVISION AND APPROVAL

A. Pavement restoration shall meet the requirements of the regulatory agency responsible for the pavement. Obtain agency approval of pavement restorations before requesting final payment.

B. Obtain the Engineer's approval of restoration of pavement, such as private roads and drives that are not the responsibility of a regulatory agency.

C. Complete pavement restoration as soon as possible after backfilling.

D. Failure of Pavement: Should any pavement restoration or repairs fail or settle during the life of the Contract, including the bonded period, promptly restore or repair defects.

3.06 CLEANING

The Contractor shall remove all surplus excavation materials and debris from the street surfaces and rights-of-way and shall restore street, roadway or sidewalk surfacing to its original condition.

END OF SECTION

SECTION 02602
SANITARY SEWER MATERIALS

1 GENERAL

1.1 SCOPE

A. All material and equipment incorporated into the work shall be new from an approved manufacturer conforming to applicable industry standards and specifications. It shall be of the size, make, type and quality specified, or as specifically approved in writing by the Engineer.

B. Except as otherwise noted or specified in writing, the Contractor shall furnish all materials and equipment incorporated in the project.

1.2 SUBMTTTALS

A. Contractor shall submit complete shop drawings and product data on all materials to the Engineer in accordance with the requirements of Section 01300 of these Specifications.

1.3 PRODUCT HANDLING

A. Use all means necessary to protect the materials before, during and after installation and to protect the work and materials of all other trades.

B. Pipe, fittings, and valves are to be stored in a manner to ensure that dirt or other debris does not contaminate the inside of the product.

C. Gaskets, bolts, lubricant and other small accessories are to be stored in containers off the ground, under a shelter or cover out of the weather.

D. Arrange deliveries of products in accord with construction schedules, coordinate to avoid conflict with work and conditions at the site.

E. Immediately on delivery, inspect shipments to assure compliance with requirements of contract documents and approved submittals, and that products are properly protected and undamaged.

2 PRODUCTS

2.1 GRAVITY SEWER PIPE

A. All sanitary sewer pipe shall be either Polyvinyl Chloride (PVC) or Ductile Iron Pipe (DIP) as shown on the drawings and specified herein.

B. Ductile Iron Pipe (DIP)

1. Ductile iron pipe shall be manufactured and tested in accordance with AWWA C151. All pipe, except specials, shall be furnished in nominal lengths of 18 to 20 feet. Sizes will be as shown on the Drawings. All pipe shall have a minimum pressure rating as indicated in the following table, and corresponding minimum wall thickness, unless otherwise specified or shown on the Drawings:

Pipe Sizes (inches)	Pressure Class (psi)
4-12	350
14-20	250
24	200
Over 24	150

2. Ductile iron pipe shall normally be of the bell and spigot type with push-on joints, conforming to ANSI Specification A21.11, unless otherwise noted.
3. Flanged pipe with a Class 53 wall thickness shall be installed at aerial stream crossings or other locations where flanged pipe is shown on drawings. Gaskets for flanged joints shall be American Toruseal Flange Gasket or approved equal. Flanged joints shall be bolted with through-bolts except where threaded taps and stud bolts are required. Bolt length and diameter shall conform to ANSI/AWWA C115 for Class 125 flanges shown in ANSI/ASME B16.1. Bolts for flanges shall be stainless steel alloy machine bolts conforming to ASTM A-193. Nuts shall be stainless steel, heavy hex conforming to ASTM A-194.

4. Ductile iron pipe shall be manufactured by ACIPCO, U.S. Pipe or McWane.

5. Provide fittings as shown on plans and conforming to ANSI A21.10 or ANSI A21.11.

6. Provide joint restraint at all fittings on pressure pipe using mechanical joint with Megalug Series 1100 retainer glands by Ebaa Iron Sales, Inc., Eastland, TX, ONE-LOK Series SLDE by Sigma Corporation, Cream Ridge, NJ, or approved equal.

7. Solid sleeves may be used where connecting plain end ductile iron pipe. Solid sleeves shall meet the requirements of ANSI/AWWA C110 for long pattern and have a minimum pressure rating of 250 psi or a rating equal to that of the adjoining pipe, whichever is greater. Solid sleeves shall have mechanical joints.

8. The exterior of pipe and fittings for buried service shall be factory coated with an asphaltic coating conforming to AWWA C151/ANSI 21.51 for ductile iron pipe,

AWWA C115/ANSI 21.15 for flanged pipe and AWWA C110/ANSI 21.10 for fittings.

9. Pipe and fittings that will be exposed or submerged shall receive surface preparation at the factory consisting of a near-white surface blasting in accordance with SSPC-SP10 followed by cleaning and coating with a two-coat factory-applied epoxy paint coating of Tnemec Series 66 epoxy or approved equal.

10. Pipe and fittings shall be cement-lined in accordance with AWWA C104/ ANSI A21.4, standard thickness, unless specified on the plans as "Protecto 401", in which case lining for ductile iron pipe and fittings shall be a factory-applied ceramic epoxy interior lining of 40 mil nominal dry film thickness. The material shall be an amine cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment equal to Protecto 401. Surface preparation, paint materials, application and quality control testing of the lined pipe shall be conducted in accordance with published specifications of the Protecto 401 lining system.

11. Coating of Bell Sockets and Spigot Ends - the gasket area and spigot end up to 6 inches back from the end of the spigot end must be coated with 6 mils nominal, 10 mils maximum using Protecto Joint Compound. The Joint Compound shall be applied by brush to ensure coverage. Care should be taken that the Joint Compound is smooth without excess buildup in the gasket seat or on the spigot ends. Coating of the gasket seat and spigot ends shall be done after the application of the lining.

C. Polyvinyl Chloride (PVC) Sewer Pipe

1. PVC pipe and fittings shall meet the requirements of ASTM D3034 (Latest Revision) for 4–inch through 15-inch diameter pipe and ASTM F679 (Latest Revision) for larger pipe. PVC pipe shall be of a thickness sufficient to meet loading conditions shown on the plans with the installed bedding and without exceeding five percent allowable deflection of the pipe. Minimum wall thickness shall be SDR 26 for pipe 15-inch and smaller per ASTM D3034 and Pipe Stiffness (PS) 115 for pipe 18-inch and larger per ASTM F679.

a. Pipe and fittings shall have bell joints consisting of an integral wall section with elastomeric gasket joint that provides a water tight seal. Gaskets shall conform to ASTM F 477 and shall meet ASTM D 3212 "Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seal". The pipe shall be capable of passing all tests which are detailed in this specification.

b. Fittings: All fittings and accessories shall be manufactured and furnished by the pipe supplier. They shall have bell and/or spigot configurations compatible with that of the pipe.

a. The manufacturer shall furnish written certification that each lot of pipe shipped to the project has been inspected, tested and meets applicable ASTM Specifications. At least one sample from each 100 pieces of pipe furnished shall be subjected to each test outlined under Section 8 of ASTM D3034. The cost of all testing shall be included in the Contractor's bid proposal and no pipe shall be installed until the testing is complete and approved by the Engineer. Pipe and fitting joints shall comply with ASTM D3212 for "Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals". Joint assemblies shall not leak when subjected to both an internal and external hydrostatic test at equivalent pressures of 10.8 psi gauge for a period of one hour. Pipes shall be tested in straight alignment, axially deflected position, and by shear load test as otherwise defined in paragraphs 7.2, 7.3, and 7.4 of ASTM D3212.

2.2 SANITARY FORCE MAINS

A. High Density Polyethylene Pipe (HDPE)

1. HDPE pipe shall be designed and manufactured in accordance with ASTM F714.

2. HDPE materials shall conform to cell classification PE 445574C for PE 4710 under ASTM D3350.

3. Physical Characteristics of Pipe Material:
   a. Density: 0.959 to 0.961 g/cm3 per ASTM D1505
   b. Melt Index: <0.15 g/10 min per ASTM D1238
   c. Hydraulic Design Basis: 1,600 PSI @ 73°F and 1,000 PSI @ 140°F per ASTM D2837
   d. UV Stabilizer: 2-3% carbon black per ASTM D3350
   e. Tensile Strength: >3,500 PSI per ASTM D638
   f. Elongation at Break (2 in/min): >700% per ASTM D638
   g. Flexural Modulus: >110,000 PSI per ASTM D790
   h. Shore D Hardness: >65 per ASTM D2240
   i. Slow Crack Growth (Pent Test): >500 hours per ASTM F1473
   j. Brittleness Temperature: < -103°F per ASTM D746
   k. Vicat Softening Temperature: >255°F per ASTM D1525
   l. Coefficient of Thermal Expansion: 1x10-4 in/in/°F per ASTM D696

4. HDPE pipe shall be SDR-13.5.

5. HDPE shall be ductile iron pipe size (DIPS) and shall have a green stripe to indicate sewer service.

6. HDPE pipe shall be marked either continuously or on intervals not to exceed five.

a. Name and/or trademark of manufacturer.
b. Nominal pipe size.
c. Dimension ratio.
d. The letters PE followed by the polyethylene grade per ASTM D3350, followed by the Hydrostatic Design Basis in 100's of PSI.
e. Manufacturing Standard Reference.
f. Production Code from which time and date of manufacturer can be determined.

B. HDPE fittings shall be in accordance with ASTM D3261 and shall be manufactured from pipe that is at least one SDR heavier pipe than the piping system. Fittings shall be pressure rated to match the piping system pressure.

2.3 DUCTILE IRON PIPE

A. Ductile iron pipe shall be designed and manufactured in accordance with ANSI/AWWA C150/A21.50 and ANSI/AWWA C151/A21.51.

B. Ductile iron used to manufacture ductile iron pipe shall meet the following minimum physical properties.

1. Minimum Tensile Strength – 60,000 PSI
2. Minimum Yield Strength – 42,000 PSI
3. Minimum Elongation – 10 percent

C. Ductile iron pipe shall be Pressure Class 350 in accordance with ANSI/AWWA C150/A21.50.

D. Joints

1. Non-Restrained Joints
   a. Push-on joints in accordance with ANSI/AWWA C111/A21.11.

2. Restrained Joints
   a. Flex-Ring joints by American Cast Iron Pipe Company
   b. TR Flex joints by U.S. Pipe and Foundry Company
   c. Owner Approved Equal

E. Gaskets

1. Plain rubber gasket in accordance with ANSI/AWWA C111/A21.11.

F. Coatings

a. Interior
1) Protecto 401.

b. Exterior
1) Asphaltic coating in accordance with ANSI/AWWA C151/A21.51.

G. Acceptable manufacturers of ductile iron pipe and fittings:

1. American Cast Iron Pipe Company
2. U.S. Pipe and Foundry Company
3. McWane Ductile

2.4 DUCTILE IRON FITTINGS

A. Standard ductile iron fittings shall be designed and manufactured in accordance with ANSI/AWWA C110/A21.10.
B. Compact ductile iron fittings shall be designed and manufactured in accordance with ANSI/AWWA C153/A21.53.
C. Ductile iron used to manufacture ductile iron fittings shall meet the following minimum physical properties.

1. Minimum Tensile Strength – 70,000 PSI
2. Minimum Yield Strength – 50,000 PSI
3. Minimum Elongation – 5 percent

D. Joints

1. Buried Fittings
a. Mechanical joints in accordance with ANSI/AWWA C111/A21.11.

b. Mechanical joints that require restraining shall be restrained with wedge type mechanical joint retainer glands for ductile iron pipe. Retainer glands shall be manufactured from high strength ductile iron in accordance with ASTM A536, Grade 65-45-12. Retainer gland dimensions shall be in accordance with ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A21.5

c. Acceptable manufacturers of retainer glands:

1) Mega-Lug Series 1100
2) Sigma ONE-LOK Series D-SLDE
3) Uni-Flange Series 1400
4) Owner Approved Equal

2. Above Grade (Non-Buried) Fittings:
a. Flanged joints in accordance with ANSI/AWWA C110/A21.10.

E. Gaskets

1. Mechanical Joints
a. Plain rubber mechanical joint gasket in accordance with ANSI/AWWA C111/A21.11.

2. Flanged Joints
a. Full face, 1/8" thick, gasket with bulb-type ring(s).
b. Gaskets shall meet the dimensions of ANSI/AWWA C115/A21.15.

3. Hardware
a. Mechanical Joints

1) Bolts shall be low carbon steel, zinc plated, tee-head bolts in accordance with ANSI/AWWA C111/A21.11.

2) Nuts shall be low carbon steel, zinc plated in accordance with ANSI/AWWA C111/A21.11.

b. Flanged Joints

1) Bolts shall be heavy hex type, low carbon steel, zinc plated in accordance with ASTM A307, Grade B.

2) Nuts shall be heavy hex type, low carbon steel, zinc plated in accordance with ASTM A563, Grade A.

3) Washers shall be SAE flat washers, low carbon steel, zinc plated in accordance with ASTM F844.

4. Coatings
a. Buried Fittings
1) Interior
a) Protecto 401.

2) Exterior
   a) Asphaltic coating in accordance with ANSI/AWWA C151/A21.51.

b. Above Grade (Non-Buried) Fittings
   1) Interior
      a) Protecto 401.

   2) Exterior
      a) Universal primer

F. All ductile iron pipe and fittings used on a project shall be new and shall be the product of a single manufacturer, unless otherwise approved by the Owner.
G. Acceptable manufacturers of ductile iron pipe and fittings:

1. American Cast Iron Pipe Company
2. U.S. Pipe and Foundry Company
3. McWane
4. Sigma

2.5 PRECAST MANHOLES

A. Unless otherwise approved all new manholes shall be precast manholes manufactured in accordance with A.S.T.M. C478. Precast manholes shall be constructed of Portland cement concrete with a compressive strength of not less than 4,000 pounds per square inch at an age of 28 days. The minimum inside diameter shall be 4 feet; wall thickness shall be not less than 5 inches; manholes 0-16' deep shall have Class 3 reinforcing, 16-22' deep, Class 4 and 22-28' deep, Class 5. Joints in the wall shall be tongue and groove with preformed butyl rubber sealant equal to Kent Seal No. 2. The design, the materials used in the manufacturing process and the transportation of precast manhole shall be subject to inspection at any time by the Engineer. Materials found defective by the Engineer will not be delivered to the job site. Material on the job site that is found defective shall be moved immediately after being notified that such material is unacceptable. Drop type manholes shall be required where the invert of any incoming line will be higher than two feet from the invert of the outlet pipe.

B. Exterior sealing of riser joints. Each manhole joint shall be sealed with an external rubber sleeve similar to the Infi-Shield Seal Wrap as manufactured by Sealing Systems, Inc. (763-478-2057). The seal shall be made of EPDM (Ethylene Propylene Diene Monomer) rubber with a minimum thickness of 30 mils. The back side of each unit shall be coated with mastic. The mastic shall be non-hardening butyl rubber sealant, with a minimum thickness of 187 mils. The seal shall be designed to prevent leakage of water through the joint sections of the manhole

C. Connections to pipes. Pre-molded rubber boots with stainless steel bands shall be used for connecting sewer pipe to manholes. These may be either the lock-in "Kor-N-Seal" type as manufactured by National Pollution Control Systems, Inc. or the cast-in type as manufactured by Interpace Division of Ball Rubber, Inc. In all cases the boot shall be sized to suit the outside diameter of the type pipe being used.

D. Manhole Steps. Manhole steps shall be slip-proof conforming to the applicable provisions of ASTM Specification C-478, latest edition, and shall be 0.5-inch minimum diameter deformed reinforcing steel, Grade 60 standards conforming to ASTM A-615, covered with polypropylene plastic or rubber and supplied with depth rings and other necessary appurtenances. Steps shall be "PS1-PF" by M. A. Industries, Inc. of Peachtree City, Georgia, or similar model as manufactured by American Step Company of Griffin, Georgia, or approved equal. The steps shall be factory built into the precast sections.

E. Watertight Manhole Frame and Cover. All manholes on this project shall be furnished with a watertight frame and cover and shall be cast iron with a coat of asphaltic paint applied at the foundry and with a "bolted-down" lid. All covers shall have "Sewer" printed on them. Manhole frame and covers shall be as manufactured by Neenah Foundry Company R-1915-F2 (435 lbs.) or approved equal. Manhole frames shall be cast in the cone or top slab for all manholes located in non-traffic areas. The minimum clear opening of the cover shall be 22 inches. On "loose-set" frame and covers, install Sealing Systems, Inc., "Flex-Seal Utility Sealant" to the interior surface of the chimney and frame area of the manhole per the manufacturer's recommendations after the frame has been grouted in-place.

F. Inverts. Manhole inverts shall be constructed of Portland cement concrete conforming to the lines and dimensions shown on details.

2.6 STEEL CASING PIPE

A. Casing pipe shall be seamless steel pipe in accordance with ASTM A139, Grade B.

1. Minimum Thickness: ¼" or as required by DOT or other governing body having jurisdiction over the crossing.

2. Minimum Tensile Strength: 60,000 PSI

3. Minimum Yield Strength: 35,000 PSI

4. Minimum Elongation in 2 Inches: 25%

5. Casing pipe shall have no mid-weld

B. Steel casing pipe shall be coated on the interior and exterior with bituminous asphalt.

2.7 CASING SPACERS

A. Casing spacers shall be Model CCS as manufactured by Cascade Waterworks Manufacturing Company of Yorkville, IL. Other acceptable manufacturers are BWM Company of Forest City, North Carolina, and Pipeline Seal & Insulator, Inc. of Houston, Texas. Two casing spacers shall be installed for each 18- to 20-foot long joint of pipe.

2.8 COMBINATION AIR/VACUUM VALVES

A. Combination air/vacuum valves shall be suitable for sanitary sewage service.

B. Valve body shall be Type 316 stainless steel.

C. Maximum Operating Pressure: 250 PSI

D. Operating Range: 0 to 250 PSI

E. Air Release Capacity: 260 CFM

F. Connection:
   1. 2" to 3": FNPT
   2. 4" and Larger: AWWA C115/ANSI B16.1

G. Acceptable Manufacturers:
   1. H-Tec Model 986

2.9 SURGE RELIEF VALVES

A. General

1. Surge relief valves shall be suitable for sanitary sewage service. Unless otherwise specified, surge relief valves shall be of a straight through "Wye" body configuration with external springs and hydraulic cushioning system and shall provide drip tight closure. Its function shall be to protect the pump system from destructive surge pressures resulting from abrupt flow stoppages. The main valve shall be capable of opening full port area with a minimum increase in inlet pressure. The cushion system shall permit a full range of adjustment for closing speeds to prevent hammer of bang.

B. Valve body shall be of cast iron ASTM A126, Grade B. Flanges shall be flat-faced and flange drilling shall be in accordance with ANSI B16.1 Class 125.

C. Valve disc shall be of cast iron ASTM A126, Grade B. The disc movement shall be guided for proper alignment throughout its stroke.

D. Valve shall have a resilient replaceable seat firmly held in place by a bronze ASTM B62 ring fastened to the disc with screws.

E. Valve external springs shall be enclosed in protective casings and shall be in compression. Springs that appear to be under extension are not permitted.

F. Acceptable Manufacturers:
   1. GA Industries.
   2. Ross Valve
   3. Engineer Approved Equal.

2.10 BALL VALVES

A. Threaded, 2-piece, standard port ball valves.
B. Body: Type 316 stainless steel (CF8M)
C. Ball: Type 316 stainless steel (ASTM A276)
D. Stem: Type 316 stainless steel (ASTM A276)
E. Packing: PTFE
F. Cold Working Pressure: Minimum 600 PSI
G. End Connections: FNPT x FNPT
H. Lever: Type 304 stainless steel with vinyl cover
I. Manufacturers
   1. Conbraco Industries, Apollo Valves
   2. Nibco, Inc.
   3. Owner Approved Equal.

2.11 SWING CHECK VALVES

A. VALVES 3-INCHES AND LARGER:
   1. Manufacturers:
      a. Dezurik
      b. Val-Matic Swing-Flex (Series 502)
      c. APCO Series 100 as manufactured by Valve & Primer Corp., Schaumburg, Illinois.
      d. American Flow Control, Series 2100
      e. Or approved equal.

B. The rubber flapper swing check valve shall have a heavily constructed ductile iron body and cover. The body shall be long pattern design (not wafer), with integrally cast-on end flanges. The flapper shall be Buna-N having an "O" ring seating edge and be internally reinforced with steel.

C. The flapper to be captured between the body and the body cover in a manner to permit the flapper to flex from closed to full open position during flow through the valve. The flapper shall be easily removed without the need to remove the valve from the line. Check valves to have full pipe size flow area. The seating surface to be on a 45-degree angle requiring the flapper to travel only 35 degrees from closed to fully open position, for minimum head loss and non-slam closure.

D. Provide Type 316 stainless steel bolts and nuts for all flanged connections.

2.12 PLUG VALVES

A. Eccentric plug valve.
B. Valve body shall be ASTM A126, Class B ductile iron.
C. Valve plug shall be Type 316 stainless steel with resilient coating.
D. Valve stem shall be Type 316 stainless steel.
E. Minimum 175 PSI working pressure for valves less than or equal to 12" in size. Minimum 150 PSI working pressure for valves greater than 12" in size.
F. Operators:
   1. In Vault: Handwheel.
   2. Buried: Square Nut, Worm Gear Actuator
G. Rotary type actuator
H. End Connections:
   1. Buried Valves: MJ x MJ
   2. Non-Buried Valves: FLG x FLG
I. Interior and exterior surfaces shall be coated with fusion-bonded epoxy coating.
J. Acceptable Manufacturers:
   1. M&H Valve Company
   2. Val-Matic Valve & Manufacturing Corporation
   3. Owner Approved Equal

2.13 BACKFILL MATERIAL - GENERAL

A. Soil backfill material within one foot of the pipe shall be clean, dry soil free of topsoil, organic matter, dirt clods, rocks or stone larger than two inches, trash or any other foreign material.

B. Soil backfill material outside of the one-foot zone from the pipe shall normally be native soil material that was removed from the trench, except in paved areas or developed areas where use of such material could cause a problem. In cases where the

native material is not suitable for backfill, select soil backfill will be hauled in and placed for trench backfill. In no case shall any organic material such debris from trees or other trash be placed in the backfill. Backfill materials shall be subject to the approval of the Engineer.

C. Details of pipe bedding and backfill are included in the Drawings. Soil and granular materials are per the Unified Soil Classification System (ASTM D2487), with the exception that bedding/backfill adjacent to the pipe is limited to 2" maximum particle size per ANSI/AWWA C600 as described in Paragraph A above.

2.14 TRENCH AND STRUCTURAL BACKFILL

A. Subgrade stabilizer shall consist of crushed stone meeting size and gradation requirements for Georgia DOT Standard Specification Section 800, #57 or #78 designation.

2.15 SERVICE CONNECTIONS

A. Service connections to PVC sewer mains shall utilize a PVC wye fitting or saddle tee with gasketed joints matching those of PVC sewer pipe.

B. Service connections to Ductile Iron Pipe shall be made by either of the following methods:

1. By coring a precise hole in the DIP main at 30 to 45 degrees from the top and installing a watertight compression fitting with a bell hub and stainless-steel band for transition to PVC service pipe such as the assembly by INSERTA Fittings Company or approved equal.

2. An alternate method is to utilize a PVC wye fitting with a one-foot long section of plain end pipe inserted in the bell end and having two transition adapters (Fernco or equal) from PVC to DIP.

2.16 TRANSITION ADAPTERS

A. Transition from Ductile Iron Pipe to PVC, or any differing types of pipe, shall be accomplished with a watertight coupling. Couplings shall be made of flexible rubber to fit over plain ends of pipe and have stainless steel bands for tightening to a completely watertight joint. Couplings for transition from DIP to PVC shall be Fernco Style 1051 or approved equal.

2.17 ASPHALT

A. Asphalt paving installed in conjunction with sewer construction shall be Hot Mix Asphaltic Concrete conforming to Georgia DOT Specification 828. The particular mix

type shall be based on the application thickness and shall be subject to approval by Engineer.

2.18 CONCRETE

A. Concrete installed in conjunction with sewer construction shall be Portland Cement Concrete having 3,000 psi design strength and meeting Georgia DOT Specification 500 for Class A concrete.

2.19 LOCATOR TAPE

A. All buried PVC or other non-metallic sewer pipe shall be marked continuously with metalized locater tape placed approximately 18 inches below grade directly above the top of the pipe. Locator tape shall be green and shall be labeled "Sewer".

3 EXECUTION

A. Refer to Section 02612 of these technical specifications.

END OF SECTION

SECTION 02612
SANITARY SEWER CONSTRUCTION

1 GENERAL

1.1 WORK INCLUDED

A. The work covered in this section includes furnishing all labor, tools, equipment, materials and incidentals necessary to construct sewer lines and associated work as shown on the drawings and as specified herein.

1.2 RELATED WORK

A. Also see the following section which contains provisions that apply specifically to the work described in this section.

B. Section 02000, General Construction Requirements, which applies to all activities under this section.

2 PRODUCTS

(See Section 02602 and other sections of these specifications)

3 EXECUTION

3.1 CLEARING AND GRUBBING

A. Where necessary, the Contractor shall clear and grub a sufficient width along the pipeline to permit installation of the work. Except at locations noted on the drawings, the minimum width of the cleared and grubbed area shall be the width of the permanent easement and the maximum shall be the width of the construction easement. In certain areas where a 30-foot permanent width is shown, Contractor may clear a 20-foot width only if this width is adequate to install the pipeline. Disposal of all trees, shrubs and debris shall be the responsibility of the Contractor who shall comply with all state and local laws and regulations including any burning bans in effect at the time of construction. The Contractor shall clear only that area of the construction site that has adequate erosion and sedimentation control in place.

B. The debris resulting from the clearing and grubbing operation shall be hauled to a disposal site secured by the Contractor and shall be disposed of in accordance with all requirements of federal, state, county and municipal regulations. In no case shall any material or debris be left on the project, placed on abutting private properties or buried on the project. Trees, stumps, brush or other clearing debris may be used within the construction easement only if ground into wood chips and used as mulch for erosion and sedimentation control.

3.2 TRENCH AND MANHOLE EXCAVATION

A. It is the responsibility of those installing sanitary sewers to conform to OSHA regulations, 29 CFR Part 1926, Subpart P, Paragraph 1226.650 through A26.653 and any other applicable sections during trench excavation. All excavations shall be adequately guarded with barricades and lights in compliance with all OSHA and Georgia Department of Transportation requirements so as to protect the public from hazard. Excavations adjacent to existing or proposed buildings and structures or in paved streets or alleys shall be sheeted, shored and braced adequately to prevent undermining or subsequent settlement of such structures or pavements. Underpinning of adjacent structures shall be done when necessary to maintain structures in a safe condition.

B. Excavation shall be by open cut from the ground surface, unless otherwise called for on the plans or allowed by the Engineer. Pipe trench shall be excavated straight and true to grade and line. Trench preparation shall proceed in advance of pipe installation only so far as can be backfilled the same day. Trench shall not be excavated more than 300 feet in advance of pipe installation.

C. Trench widths for sewer pipe shall have a maximum width, measured at the center line of the pipe, equal to the nominal diameter of the pipe, plus 2'-0". The trench may have a greater width than this, beginning at one foot above the top of the pipe and extending to the top of the ground, if such width is necessary or desirable.

D. Rock Excavation

1. Trench rock is defined as any material which cannot be excavated with a backhoe having a bucket curling force rated at 25,700 pounds (Caterpillar Model 225 or equivalent), and occupying an original volume of at least one-half cubic yard.

2. Rock in trenches shall be excavated over the horizontal limits of excavation to a minimum of 4 inches on all sides and under the pipe to provide a cushion of #57 crushed stone.

3. Blasting operations shall be conducted in strict accordance with all existing ordinances and regulations and shall be done by persons licensed to use explosives. No blasting shall be done less than 50 feet in advance of the completed work. Contractor shall be responsible for obtaining any blasting permits required.

4. All exposed structures shall be carefully protected and where necessary, the blast shall be covered with suitable mats. Any damage caused by blasting shall be promptly repaired by the Contractor at his expense. Explosives and other blasting supplies shall be stored in accordance with all federal, state and local ordinanc

E. Subgrade Stabilizer

1. In the event that the subgrade under the pipe or other structure does not provide a suitable foundation for the pipe or other structure and when so directed by the Engineer, the said subgrade shall be stabilized by undercutting below the normal trench bottom to remove unstable material. Stabilizer stone, Georgia DOT no. 57 crushed granite, shall be placed to the depth required to stabilize the trench bottom.

F. Wherever streets, roads, or driveways are cut, they shall be immediately backfilled and compacted after the pipe is installed and shall be maintained in first-class condition and passable at all times until re-surfaced. Reasonable and satisfactory provisions shall be made by the Contractor to allow travel on walkways and driveways by installing temporary crossings.

G. Excavation materials shall be so placed as not to endanger the work and so that free access may be had at all times to all parts of the trench and to fire hydrants and water valve boxes.

H. Backfilling, compaction, dressing and clean-up shall be kept as close to the line-laying crew as is practical, and negligence in this feature of the work will not be tolerated.

3.3 PIPE BEDDING and HAUNCHING

A. Trenches shall be kept free of water. Pipe shall not be installed in water or unstable foundation. All water pumped, bailed or otherwise removed from the trench or other excavation shall be conveyed in a proper manner to a suitable place of discharge where it will not cause injury to the public health or to public or private property or to work completed or in progress, or to the surface of the streets or cause any interference with the use of same by the public. The contractor will be required to provide and operate any equipment necessary to keep the trenches free from water while pipe is being laid and the joints made.

B. The trench shall have smooth, even bottom affording the pipe support throughout its length between bell holes. Bell holes shall be dug sufficiently large for proper joining of the pipe. Blocking under the pipe to bring the pipe to grade or any other method that causes point loading shall not be allowed.

C. Pipe bedding (the area below the bottom of the pipe barrel) shall be as shown on the drawings. The bedding shall be placed on a flat trench bottom with a minimum thickness beneath the pipe of one-eighth the outside pipe diameter, but not less than 4 inches and sliced under the haunches of the pipe with a shovel or other suitable tool to a height of one-half the outside pipe diameter. For ductile iron pipe, the pipe bedding shall be in accordance with the following table and the details shown on the drawings, except that restrained joint pipe shall use Type 4 bedding, unless the depth of cover is exceeded, in which case Type 5 shall be used.

Size in.	Pressure Class	LAYING CONDITIONS Maximum Depth of Cover in Feet		
		Type 3	Type 4	Type 5
4	350	69.0	85.0	100.0
6	350	37.0	47.0	65.0
8	350	25.0	34.0	50.0
10	350	19.0	28.0	45.0
12	350	19.0	28.0	44.0
14	250	15.0	23.0	36.0
16	250	15.0	24.0	34.0
18	250	14.0	22.0	31.0
20	250	14.0	22.0	30.0
24	200	12.0	17.0	25.0

3.4 INSTALLATION OF SEWER PIPE

A. Pipe and accessories shall at all times be handled with care to avoid damage. Whether moved by hand, skidways or hoists, material shall not be dropped or bumped. The interior of all pipe shall be kept free from dirt and foreign matter at all times. Each joint of pipe shall be unloaded near the place where it is to be laid in the trench.

B. All pipe and accessories shall be inspected prior to lowering into the trench. Material that is defective in manufacture or has been damaged in transit or after delivery shall be removed from the job site.

C. Sewer pipe shall be joined by "push-on" joints using elastomeric gaskets to effect the pressure seal. The ends of pipe to be joined and the gaskets shall be cleaned immediately before assembly, and the assembly shall be made as recommended by the pipe manufacturer. Lubricant used must be non-toxic and supplied or approved for use by the pipe manufacturer. Sewer pipes shall be laid in the uphill direction with the bells pointing upgrade.

D. Pipe grades shall be maintained by the use of a laser and verified with a surveying level and rod on an ongoing basis. The Contractor shall be responsible for staking both line and grade and the correctness thereof. Subsidiary lines and grades shall be laid out by the Contractor from the controlling lines and bench marks established by the Engineer, or from the measurements shown. All lines and grades shall be subject to checking by the Engineer, but that checking shall in no way relieve the Contractor from the responsibility for maintaining correct line and grade. The Contractor shall provide such stakes, materials, survey instruments, labor and assistance as the Engineer may require in laying-out work, establishing bench marks, and checking and measuring the work.

E. No section of pipe shall be laid until the preceding section has been belled and bedded.

F. When pipe laying is not in progress, the open ends of installed pipe shall be plugged by approved means to prevent entrance of trench water or debris into the line.

G. Wyes and/or service connections and stubouts from manholes shall be placed where shown on plans and as directed by the Engineer. Stubouts shall be made with PVC pipe unless otherwise shown on the drawings. All such connections shall be plugged with suitable plug or stopper and made watertight with hydraulic grout, if necessary, and shall be marked at ground level with a suitable marker for future location.

H. Sewer lines should be installed at least 10 feet horizontally from existing or proposed water mains. Sewers crossing water mains should be installed to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer.

I. Sections of polyethylene pipe should be joined into continuous lengths on the jobsite above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements of 400 degrees Fahrenheit, alignment, and an interfacial fusion pressure of 75 PSI. The butt fusion joining will produce a joint weld strength equal to or greater than the tensile strength of the pipe itself. All field welds shall be made with fusion equipment equipped with a Data Logger. Temperature, fusion pressure and a graphic representation of the fusion cycle shall be part of the Quality Control records.

J. Sidewall fusions for connections to outlet piping shall be performed in accordance with HDPE pipe and fitting manufacturer's specifications. The heating irons used for sidewall fusion shall have an inside diameter equal to the outside diameter of the HDPE pipe being fused. The size of the heating iron shall be ¼ inch larger than the size of the outlet branch being fused.

K. Mechanical joining will be used where the butt fusion method cannot be used. Mechanical joining will be accomplished by either using a HDPE flange adapter with a Ductile Iron back-up ring or HDPE Mechanical Joint adapter with a Ductile Iron back-up ring.

L. Socket fusion, hot gas fusion, threading, solvents, and epoxies will not be used to join HDPE pipe.

3.5 BACKFILLING

A. Backfilling shall be carried along as closely to pipe laying as possible. Not more than 100 feet on trench shall be opened on any line in advance of pipe laying. The length of the trench to be opened in advance of the completed work shall be reduced where appropriate for the convenience and safety of the persons residing in the vicinity of the work. The maximum length of trench left open overnight shall not exceed three times the depth of the trench. All openings shall be surrounded by barricades at night with blinker lights not more than ten feet apart around the opening

B. As each section of the line is completed, the trench shall be carefully backfilled. No length of pipe shall be installed until one preceding it shall have sufficient quantity of backfill tamped around it to hold it firmly in place. Pipe haunching (the area above the bottom of the barrel of the pipe up to a line one-half of the pipe outside diameter) and initial backfill (the area above the haunching material and below a plane 12 inches above the top of the barrel of the pipe) shall be as shown on the drawings. Material used for pipe haunching shall be shovel sliced or otherwise placed to provide uniform support for the pipe barrel and to fill completely all voids under the pipe.

C. When sheeting or a trench box is used during excavation, before the sheeting or trench box is removed, it shall be raised in place to just above the pipe crown to safely allow the Contractor to completely fill any voids left in the pipe zone.

D. No excavation shall be made under highways, streets, alleys or private property until satisfactory arrangements have been made with the State, City, County, or Owners of the property to be crossed.

E. Final backfill (the area above a plane 12 inches above the top of the pipe) shall be placed in 6" layers and tamped so that after consolidation, the dry weight shall be not less than 85% of the maximum laboratory dry weight per cubic foot as determined by ASTM Method D-698. The soil in trenches within roadways (including shoulders) and paved areas shall be compacted to a dry density of 95% of ASTM Method D-698. The standard maximum dry density and the optimum moisture shall be determined by the same method.

3.6 STEEL CASING INSTALLATION

A. Steel Casing pipe shall be installed by the "Jack and Bore" procedure, the "Open-Cut" method or by microtunneling. Steel casing pipe shall be installed at the specific locations called for on the plan sheets and the installation method shall be by the "Jack and Bore" or microtunneling procedure unless specifically stated to be installed by the "Open-Cut" method.

B. The "Jack and Bore" installation procedure shall be by the dry-bore method. The hole is to be mechanically bored and cased through the soil by a cutting head on a continuous auger mounted inside the casing pipe. The installation of the casing and boring of the hole shall be done simultaneously by jacking. Lengths of pipe are to be continuously welded the full circumference of the pipe diameter to the preceding section installed. Excavation material will be removed and placed at the top of the working pit. Backfill materials and methods of backfilling and tamping shall be as required under BACKFILLING.

C. The "Open-Cut" method consists simply of excavating the trench along the pipeline route and placing the steel casing in the trench. Special care shall be taken not to damage any existing utilities as the sections of casing are maneuvered into the open trench. Lengths of pipe are to be continuously welded the full circumference of the pipe diameter to the adjacent sections. Backfill materials and methods of backfilling and tamping shall be as required under BACKFILLING

D. Casing spacers shall be used while installing the sewer inside the casing. Spacers shall be located within 2' of each end of the casing and spaced no more than 10' apart within the casing. After the sewer is installed in the casing, a check shall be made to ensure that the carrier pipe is not touching the casing at any point. The ends of the casing pipe shall be sealed with a three course mortared brick wall, one course of which shall be erected inside the casing.

E. Construction techniques required to provide access for casing shall be such as to ensure the safety of the work. Final dimensions of access pits selected by Contractor shall conform as with minimum dimensions required to permit the installation of the work. The contractor shall be required to properly support all excavations and to prevent all movement of the soil, pavement, utilities or structures outside of the excavation. All pits shall conform to applicable Local Safety Standards, OSHA Standards, trenching and shoring standards. Provide surface drainage during the period of construction to protect the work.

F. Casing will be installed in accordance with the line and grade shown on contract drawings.

G. The contractor is totally responsible for the performance of the equipment and methods selected for this phase. Each pipe section shall be jack forward as the excavation progresses in such a way to provide complete and adequate ground support at all times. Lubrication shall be applied to the external surface of the pipe to reduce skin friction. A jacking frame shall be positioned to develop a uniform distribution of ramming forces around the periphery of the pipe. The Contractor is responsible for monitoring ground movements associated with the work and making suitable changes in the construction methods to control ground movements and prevent damage or detrimental movement to the work and adjacent structures and pavements. A lubrication system shall be provided that injects an approved lubricant on the inside and outside of the pipe to lower the friction developed on the sides of the pipe during jacking. The overcut on the pipe shall not exceed 1 inch. The annular space created by the overcut shall be filled with a lubricant that has been proved suitable for the particular soil conditions.

H. Welds shall be complete around the casing joints and smooth to permit the passage of carrier spacers. The line and grade shall not vary within the overall casing. The installation shall permit the continuous installation of the carrier pipe with spacers

3.7 MANHOLE INSTALLATION

A. The manhole base shall be set upon a 6 inch (minimum thickness) mat of #57 crushed stone.

B. The invert of manholes shall be constructed of either brick and mortar or 2500 psi concrete and shall have a cross section of the exact shape of the invert of the sewer which it connects, changes in size and grade being made gradually and evenly. Changes in the direction of the sewer and entering branch or branches shall have a true curve of as large a radius as the size of the manhole will permit. Drop manholes will be required where the invert of any incoming line will be higher than two feet from the invert of the outlet pipe. All manholes shall be water tight when completely built

C. Masonry work shall be allowed to set for a period of not less than 24 hours. All loose or waste material shall be removed from the interior of the manhole. The manhole cover then shall be placed and the surface in the vicinity of the work cleaned off and left in a neat and orderly condition.

D. The cast iron frame for the manhole cover shall be set at the required elevation and properly anchored to the masonry. Where manholes are constructed in paved areas, the top surface of the frame and cover shall be shimmed, if necessary, to conform to the exact slope, crown and grade of the existing adjacent pavement. Shims shall be one of the manufactured systems designed for this purpose, or properly constructed masonry that provides full support to the manhole frame. In unpaved areas, manhole frames and covers shall be cast into the cone or top sections of the precast manholes, and the top shall be terminated higher (from a few inches in mowed areas to 18 inches in wooded areas) than surrounding grade and the soil shall be graded to drain away from the manhole.

E. All manholes shall be water tight when completely built.

3.8 CONNECTION OF SEWER MAINS

A. An approved Shear Band Fernco Adaptor shall be used for connecting sewer pipes in any situation where a gasketed bell to spigot connection is not possible. The adapter shall provide a fully watertight connection. Care shall be taken not to disturb the original bedding of the existing pipe outside the area required for the proper installation of the adaptor. The adaptor shall be bedded and covered with #57 stone.

3.9 CONNECTION OF SEWER SERVICE LINES

A. All existing sewer service lines connected to the existing sewer main shall be located by internal televising of the main. Televising will be performed by a qualified company routinely engaged in this type work. A written log will be prepared during the televising operation listing the location and position of each service connection and recording, either digital or tape, will be provided for a permanent record of the televising. Unless otherwise directed, all existing service connections will be reconnected to the new sewer main.

B. Service connections to the main will be made using the materials outlined in Section 02602 at the main. Connection of new service pipe to existing service pipe will use PVC pipe of the same size as the existing service and an approved Shear-band Fernco adaptor.

C. Where sewer services are installed at vacant lots under this contract, the Contractor shall install a 2" x 2" pressure treated wooden stake, 3-feet long, as a visual marker directly above the end point of the sewer service. The marker shall extend 2 feet above ground and be painted orange.

3.10 PLACING OF STEEL CASING PIPE

A. Steel casing pipe shall be installed by the "Jack and Bore" procedure unless otherwise stated at any specific location on the drawings.

B. The "Jack and Bore" installation procedure shall be by the dry-bore method. The hole is to be mechanically bored and cased through the soil by a cutting head on a continuous auger mounted inside the casing pipe. The installation of the casing and boring of the hole shall be done simultaneously by jacking. Lengths of pipe are to be adequately welded to the preceding section installed. Excavation material will be removed and placed at the top of the working pit. Backfill materials and methods of backfilling and tamping shall be as called for elsewhere in this section.

C. For locations other than the crossing under Interstate 20, prior to installation of the steel casing pipe, the contractor shall dig or drill exploratory test holes to determine the existence of solid rock. The testing procedures may be accomplished by either test drilling or excavation at the proposed location of the bore and to at least three feet below the proposed depth. As a minimum, these tests are to be conducted at each end of each proposed casing location. Where the casing length exceeds 100 feet or where rock is evidenced, there shall be additional exploratory test holes placed along the length such that the average distance between holes is not more than 50 feet. Contractor shall provide Engineer with written results of exploratory drilling prior to mobilizing for the boring operation. Failure of the Contractor to comply with this provision will make the contractor ineligible for any compensation associated with encountering of rock in the attempted bore.

D. If exploratory drilling indicates rock in the line of the bore, then an alternate location will be selected by the Engineer for the bore or other provisions will be chosen. After a suitable location is chosen and the placing of casing pipe begins, Contractor shall immediately notify Engineer if rock is encountered.

E. Bore pits for cased bores and uncased bores shall be constructed as needed to avoid conflicts with existing utilities and still remain in the limits of the construction area. Bore pits shall be constructed, marked and barricaded to comply with applicable safety regulations

F. Casing spacers shall be placed on the carrier pipe to center it and restrain it in position inside the casing. Two spacers per joint of pipe shall be attached within one foot of the pipe joint. Spacers shall be of an approved design and manufacturer and shall be made of stainless and/or dense polymer, and shall be capable of the load applied by the pipe when full of water with a safety factor of at least 2.0.

G. If required by local or state authorities, casings installed under roadways shall be grouted to fill the annular space between the casing and the carrier pipe. Grout shall be pumped through small pipes inserted into the space to ensure full penetration and filling. Grout for this purpose may be one of the special mixtures of low density, air-entrained grout designed for pumping

3.11 AERIAL STREAM CROSSINGS

A. Aerial crossings of streams are to be constructed at locations shown on drawings and in accordance with the following requirements:

1. Excavations for concrete piers shall extend down to firm soil, at least one foot below the elevation of the stream bed. Contractor shall coordinate a geotechnical inspection to confirm soil bearing, and after soil bearing is confirmed shall place an 18 inch thick bedding of no. 57 stone approximately 6 feet in diameter. Dewatering will be performed as needed to provide a stable foundation for the work.

2. Concrete for the piers shall meet the requirements specified under Section 2602 of these specifications. Forming for the piers shall be treated paper fiber Sonotube or approved equal forming product.

3. Vertical reinforcing steel for each pier shall be eight no. 5 bars spaced evenly around a circle of 12 inch radius. Vertical bars shall be enclosed with standard hoop rings of no. 4 bars spaced at 10 inches apart.

4. Tops of piers will terminate one inch below the outside bottom of the sewer pipe. Pipes shall be anchored to piers with ¾ inch diameter, all-thread, 316 stainless steel bolts embedded 6 inches into concrete. A stainless steel strap, 2" wide x 3/8" thick and curved to cradle the pipe, will be placed below the pipe on leveling nuts for vertical adjustment. A similar strap curved to cover half the pipe diameter will be place over the top of the pipe and bolted to the anchor bolts.

5. Pipe for aerial crossings shall be flanged pipe as specified in Section 02602.

6. Rip-rap and filter fabric shall be placed as shown on drawings, ensuring that the flow path beneath the pipe remains unobstructed at least to its original profile and cross section.

3.12 FIELD TESTING OF SEWERS

A. Field Testing

1. After completion of any section of gravity pipeline and before placing a section into operation the grades, joints, and alignment shall be true to line and grade. Joint surfaces shall be smooth. There shall be no visual leakage and the sewer shall be completely free from any cracks and from protruding joint materials, deposits of sand, mortar, or other materials on the inside.

2. As a minimum the completed pipeline will be subjected to the following tests:
   a. Leakage test
   b. Visual straightness test
   c. Slope measurement
   d. Mandrel test for PVC pipe

3. The Contractor will be required to furnish pipe plugs, weirs, cords, mandrels and any other customary devices needed to carry out the above-listed tests at no added cost. He will also furnish supervision and labor to carry out these tests in the presence of the Engineer.

B. Leakage Testing

1. Infiltration or exfiltration testing in accordance with ASTM C-1091, may be used in lieu of air testing provided the test is conducted with at least two feet of head above the top of the pipe being tested. Allowable infiltration or exfiltration shall not exceed 25 gallons per 24 hours per inch of diameter per mile of pipe. Contractor shall furnish all supplies, materials,

labor, and services needed to make infiltration or exfiltration tests including water. No separate payment will be made for equipment, supplies, material, water, or services.

2. Any leakage exceeding the allowable amount shall be corrected by an approved method until the pipelines meet the requirements of the allowable leakage specifications. Any visible flow (not including seepage) in manholes shall be repaired.

3. Infiltration tests shall be made when groundwater level is 18-inches or more above the top of the outside of the pipe.

a. When normal groundwater does not stand at a level outside the pipe to enable infiltration tests to be made to the satisfaction of the Engineer, the Contractor shall make exfiltration tests by filling the pipe or sections thereof with water to a head of not less than 2 feet above the top of the outside of the pipe and observing the amount of water required to maintain this level.

b. Low pressure air testing may be used in lieu of infiltration testing at the Contractor's request. A Low Pressure Air Test shall be made in accordance with ASTM F 1417, as indicated below:

1) Clean pipe to be tested by propelling snug-fitting inflated rubber ball through pipe with water.

2) Plug all pipe outlets with suitable test plugs. Brace each plug securely to prevent blowouts. As a safety precaution, pressurizing equipment shall include a regulator set at slightly above test pressure to avoid over-pressurizing and damaging an otherwise acceptable line. No one shall be allowed in the manhole during testing.

3) If the pipe to be tested is submerged in groundwater, insert a pipe probe by boring or jetting, into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when air passes slowly through it. This is the back pressure due to groundwater submergence over the end of the probe. All gauge pressures in the test should be increased by this amount.

4) Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psig.

5) After an internal pressure of 4.0 psig is obtained, allow at least two minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.

6) When pressure decreases to 3.5 psig, start stopwatch. Determine the time in seconds that is required for the internal air pressure to reach 2.5 psig. Minimum permissible pressure holding times for runs of single pipe diameter are indicated in the table below in seconds. Times for mixed pipe sizes of varying lengths should be calculated as described in ASTM C 828-76T using formula t = K x d/q (q = 0.0020).

Minimum Test Time for Various Pipe Sizes			
Nominal Pipe Size (inches)	T (time) Min/100 feet	Nominal Pipe Size (inches)	T (time) min/100 feet
3	0.2	21	3.0
4	0.3	24	3.6
6	0.7	27	4.2
Minimum Test Time for Various Pipe Sizes			
8	1.2	30	4.8
10	1.5	33	5.4
12	1.8	36	6.0
15	2.1	39	6.6
18	2.4	42	7.3

C. Leakage Testing of Manholes

1. Prior to testing manholes for watertightness, 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:

   a. Exfiltration Tests: The manhole, after proper preparation as noted above, shall be filled with water. The maximum allowable leakage shall be 0.1 gallon per hour per foot of diameter per foot of depth. Tests shall last a minimum of eight hours. The manholes may be backfilled prior to testing.

   b. Vacuum Tests: The manhole, after proper preparation as noted above, shall be vacuum tested prior to backfilling, in accordance with ASTM C-1244. 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, 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 manufactured by P.A. Glazier, Inc. or approved equal.

D. Visual Straightness Test

1. Straightness of the completed sewer will be checked visually using reflected light or lanterns. Each segment between manholes must show at least 80 percent of the full pipe circle visible when looking from manhole to manhole.

E. Slope Measurement

1. Slope of the completed pipeline will be checked at each manhole to verify conformance with planned grade. Any variance in slope which in the Engineer's opinion is detrimental to the functional ability of the pipe will be cause for rejection. The Contractor is responsible for checking slope of pipe with a level at least every 100 feet as the job progresses and maintaining calibration of laser equipment. With each monthly pay request, the Contractor shall submit a copy of his survey notes showing actual elevation at each manhole and slope of each segment between manholes.

F. Mandrel Test

1. Each segment of completed pipeline will be checked by the Contractor pulling a mandrel of specified dimensions through the pipe. Vertical deflection shall not exceed five (5) percent of the undeflected diameter measured in accordance with ASTM Standards D3034 and F679, as applicable. The test shall be conducted at least 30 days after installation to allow for settlement of the pipeline.

2. Failure to satisfy any of the above tests will be reported promptly to the Engineer who, in consultation with the Owner and Contractor, may recommend additional tests or corrective action.

3.13 FIELD TESTING OF FORCE MAINS

A. Field hydrostatic testing shall be in accordance with Section 02667 of these specifications.

3.14 CLEAN-UP AND MAINTENANCE

A. All surplus materials, tools, temporary structures, excess dirt, rubbish and debris shall be removed by the Contractor and the site of construction shall be left in a clean and neat condition, satisfactory to the Engineer.

3.15 FINAL ACCEPTANCE

A. No pipeline installation or hydraulic structure shall be accepted until all known and visible leaks have been repaired, whether or not the leakage is within the maximum allowable limits. Location and repair of leaks shall be performed by the Contractor at no additional expense to the Owner.

B. The Contractor will certify that all required tests have been successfully completed before the work is accepted.

C. Any pipe which has its alignment, grade, or joints disturbed after installation shall be removed and re-installed.

3.16 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700.

** END OF SECTION **

SECTION 02740
Bypass Pumping/Wastewater Flow Control

PART 1 GENERAL

1.01 SCOPE

A. The purpose of this section is to define the various methods of wastewater flow control including plugging/blocking and bypass/diversion pumping. Wastewater flow control shall maintain an efficient and uninterrupted level of service to the sewer system while investigative or construction operations (including rehabilitations, repair or replacement) are performed. Bypass Pumping shall be set up only after all sewer(mains and manholes) have been installed and work on existing MH 1 is ready to commence. Existing MH1 is the wetwell for Fieldstone Pump Station.

1.02 REFERENCES

A. Codes, Specifications and Standards (None cited)

B. Testing and Materials Standards (None Cited)

C. Rockdale County Water Resources Water and Wastewater Standards and Specifications

D. General Conditions for Rockdale County Construction Contracts, Rockdale County

1.03 DEFINITIONS (None Cited)

1.04 PERSONNEL

A. The Supervisor must daily visit the project site checking on their personnel and subcontractors, meeting with the field crew leaders as well as checking on the status and progress of the project.

B. A field crew leader must be with their crew when their crew is working. Each field crew leader can only have one crew. Each crew must have it's own field crew leader.

1.05 SUBMITTALS

A. Seven (7) calendar days prior to any bypass/diversion pumping activity the Contractor shall submit a copy of the complete and detailed plan to the County for review. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction. The Contractor may submit a general bypass/diversion pumping plan that will be used when bypassing sewer mains 8-inch diameter and smaller. Once the Contractor has received written approval from the County for this 8-inch diameter and smaller sewer main plan the Contractor may use that plan without re-submittal.

B. The bypass/diversion pumping plan submittal shall have sufficient detail to show the following:

1. Lowest overflow point upstream of the bypass/diversion.
2. Pump stations upstream of the bypass/diversion.
3. Staging area for pumps
4. Sewer plugging method and types of plugs
5. Number, size, material, location and method of installation of suction piping
6. Number, size, material, location and method of installation of discharge piping
7. Bypass pump sizes, capacity, number of each size to be onsite and the power requirements
8. System curve design calculations detailing the static lift, friction losses, velocity losses and flow velocities.
9. Pump curves with the system curves plotted showing the pump operation range and confirming the pump size, horsepower and impeller required
10. Standby power generator size and location, if utilized
11. Noise control and abatement measures
12. Downstream discharge plan including pipe routing plan and profile views
13. Sections showing suction and discharge pipe depth, embedment, joint restraints, thrust blocking and backfilling
14. Method of protecting discharge manholes or structures from erosion and damage
15. Location and position, in detail, where pipes cross roadways and driveways

C. For bypass plans associated with twelve (12) inch or larger sewer mains a Professional Engineer must sign and seal the bypass/diversion plan.

D. The Contractor will provide an emergency response plan for each bypass/diversion pumping. The plan will be followed in the event of failure of the bypass/diversion pumping system.

E. The Contractor must identify all pump stations and the lowest overflow point upstream of the plugging/block and/or bypass/diversion pumping. The Contractor may be required to station personnel at upstream pump stations and overflow points.

F. The Contractor shall notify the County 48 hours prior to commencing any plugging/block and/or bypass/diversion pumping.

1.06 MEASUREMENT AND PAYMENT

A. No separate payment will be made for the wastewater flow control method of plugging/blocking. The work and materials being considered as incidental to and part of other unit bid prices.

B. No separate measurement or payment will be made for Contractor personnel that may be required to monitor pump stations and/or overflow points upstream of any plugging/block and/or bypass/diversion pumping. The work, materials and personnel being considered as incidental to plugging/blocking operations and bypass/diversion pumping unit prices.

C. Payment for bypass/diversion pumping shall be made on a lump sum basis. Payment will be full compensation for furnishing all labor, tools, fuels, maintenance, traffic control, and equipment necessary to perform all work.

PART 2 PRODUCTS

1.01 PIPE FOR FLOW DIVERSION

A. Steel pipe is permitted for flow diversion.

B. Polyethylene Pipe is permitted for flow diversion. Polyethylene material shall comply with the requirements for Type III polyethylene, C-S and P-34 as tabulated in ASTM D-1248 and has the Plastic Pipe Institute recommended designation PE3406. The material shall also have an average specific base resin density of between 0.94 g/cc and 0.955 g/cc (ASTM D-1505). Pipe made from these resins must have a long-term strength (50 years) rating of 1,250 psi or more per hydrostatic design basis categories of ASTM D-2837. The polyethylene resin shall contain antioxidants and be stabilized against ultraviolet degradation to provide protection during processing and subsequent weather exposure. The polyethylene resin shall have an environmental stress crack resistance; condition C as shown in ASTM D-1693, to be greater that 500 hours, 20% failure. All pipes shall be made from virgin quality material. No rework compound, except that obtained from the manufacturer's own production of the same formulation shall be used. The polyethylene resin shall have an average melt flow index, condition E as shown in ASTM D-1238, not in excess of 0.25 g/10 mm. Pipe shall be homogeneous throughout, and free of visible cracks, holes, foreign material, blisters, or other deleterious faults. Diameters and wall thickness shall be measured in accordance with ASTM D-2122. Pipe joining will be done by thermal butt fusion method in accordance with ASTM D-2657.

C. Polyvinylchloride (PVC) pipe is permitted for flow diversion. PVC pipe shall be rigid and securely coupled with a minimum number of connections. Glued PVC is not allowed.

D. Irrigation type piping is not allowed.

E. No more than two (2) pump discharge hoses will be allowed at any given time. The length of these hoses shall be limited at the direction of the County.

F. The Contractor, at a minimum, shall design all piping, joints and accessories to withstand twice the maximum operating pressure or 100 psi whichever is greater.

G. If required the Contractor must provide air relief (air relief valves, etc) on bypass/diversion pumping discharge piping to insure proper operation.

PART 3 - EXECUTION

1.01 GENERAL

A. Prior to commencing each bypass/diversion pumping activity the Contractor must receive written approval from the County.

B. The pumping rate of existing Fieldstone Pump Station is approximately 200 gpm.

C. Ensure all levels of sewage flow are continuously and effectively handled.

D. The Contractor shall use ingenuity and skill to develop a bypass/diversion pumping plan.

E. The back-up pump, appropriate piping, fuel, lubrication and spare parts shall be incorporated into the bypass/diversion pumping arrangement at the site, ready for use in case of a breakdown.

F. At no cost to the County, the Contractor will carry out a "trial run" of the bypass/diversion arrangement on all sewers greater than 12-inches. This trial run must be conducted before the County will accept the arrangement. The "trial run" shall demonstrate the incorporation of all standby equipment to handle flows when the main pump set is switched off.

G. All materials used for bypass/diversion pumping shall be pre-approved by the County prior to commencing pumping activities.

H. When wastewater flows at the upstream manhole of the sewer main being televised are above the maximum allowable requirements for television inspection, or do not allow the proper sewer or manhole repair, the flows shall be reduced to the levels required by one of the following methods: plugging/blocking or bypass/diversion pumping of the flows, as approved by the County.

I. In some applications, the wastewater flow may be plugged/blocked and contained within the capacity of the collection system. This shall only be done when it has been determined by the Contractor and approved by the County that the system can accommodate the surcharging without any adverse impact.

J. When a sanitary sewer is being rehabilitated or replaced, the Contractor, at his own expense and at no cost to the County, shall provide and maintain temporary outlets and connections for all private or public service laterals connected to or served by the sewer main being rehabilitated or replaced, and where necessary, shall provide adequate pumping facilities; and shall maintain these services until such time as the permanent sewers and connections are installed and in service.

K. During construction, flows in sections of the existing sewer being rehabilitated by removal and replacement shall be accommodated by plugging/blocking or bypass/diversion pumping.

L. The plan must keep the wastewater flowing without discharge or spills into any adjacent creeks or on to the ground. The Contractor will seek and obtain inspection of each section of newly laid sewer before removing the flow diversion from service and placing the newly installed or rehabilitated section into service.

M. In sections of the existing sewer being rehabilitated by laying a new line parallel to the existing sewer, the existing sewer may be used to accommodate the existing flow, and no bypass/diversion pumping will be necessary if the existing sewer is not damaged or its use restricted by the Contractor's operations.

N. All pipe materials utilized in wastewater flow control shall be in good condition, and free of defects, and leaks. The Contractor at no cost to the County shall replace any defective material. Upon completion of the job, wastewater flow control materials shall be removed from the site.

1.02 DEPTH OF FLOW

A. In performing television inspection, joint testing, and/or sealing and other sewer rehabilitation work, the Contractor shall control the depth of flow in the sewer within the following guidelines:

Maximum Pipe Flow Depth

Television Inspection		**Joint Testing and Sealing**	
Pipe Size	**% Pipe Dia.**	**Pipe Size**	**% Pipe Dia.**
6"-12"	10	6"-12"	20

15"-24"	10	15"-24"	25
27" or larger	10	27" or larger	30

B. When sewer line flows, as measured in the first manhole upstream of the sewer segment being rehabilitated, exceed the maximum depth listed above or inspection of the complete pipe periphery is necessary for effective testing, sealing, or line work, the Contractor shall implement wastewater flow control methods. The implementation of the flow control method shall be reviewed and approved by the County.

1.03 PLUGGING AND BLOCKING

A. The Contractor shall insert a sewer line plug into the line at a manhole upstream from the section being inspected or repaired. The plug shall be so designed that all or any portion of the operation flow can be released. Flows shall be shut off or reduced to within the maximum flow limits specified. Wastewater flow shall be restored to normal following completion of work.

1.04 BYPASS/DIVERSION PUMPING

A. When bypass/diversion pumping is required, a pump size shall be recommended by the Contractor and approved by the County. The Contractor shall supply the necessary pumps, conduits, and other equipment to divert the flow of wastewater around the sewer section in which the work is to be performed. The bypass system shall be of sufficient capacity to handle existing flows plus additional flow that may occur during periods of rainstorms as indicated from the flow monitoring program. The Contractor shall be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. A "setup" consists of the necessary pumps, conduits, and other equipment required to divert the flow of wastewater from the start to finish of work performed.

B. Wastewater shall be pumped directly into the nearest available downstream manhole, provided that the existing sewer has capacity to transport the flow. The Contractor shall request the County to determine the capacity of the downstream existing system. The Contractor shall request this determination fourteen (14) calendar days prior to the planned bypass/diversion pumping.

C. All pumps used shall be centrifugal self-priming units that do not require the use of footvalves or Compressor in the priming system. The pumps shall be diesel or electric powered. Pumps shall have sound attenuation enclosure designed for operation at sound levels of 70 decibels and below. The Contractor is fully responsible for coordinating and obtaining temporary electrical service.

A. The Contractor shall be responsible for keeping the pumps running continuously 24 hours a day until the bypass operation is no longer required. The Contractor shall have standby pumps at all times.

B. Maintenance personnel capable of starting, stopping, refueling, and maintaining the pumps and equipment during the bypass/diversion pumping operation shall continuously monitor pumps and equipment. Pumping is required on a 24-hour basis, engines shall be equipped in a manner to keep noise to a minimum.

1.02 FLOW CONTROL PRECAUTIONS

A. Where the wastewater flow is plugged/blocked, the Contractor shall be responsible for taking sufficient precautions to protect public health. The sewer lines shall also be protected from damage. The following shall apply:

1. No wastewater shall be allowed to back up into any homes or buildings.
2. No wastewater shall overflow any manholes, cleanouts, or any other outlet.
3. Customers upstream of the flow control area shall be able to use all their water and sewer utilities without interruption.
4. If any of the above occur or are expected to occur, the Contractor shall provide bypass/diversion pumping to alleviate one or all of the conditions. Additionally, the Contractor shall observe the conditions upstream of the plug and be prepared to immediately start bypass/diversion pumping, if needed.

B. Any sump pumps, bypass pumps, trash pumps, or any other type of pump, which pulls wastewater or any type of material out of the manhole or sewer, shall discharge the material into another manhole, or appropriate vehicle or container approved by the County. **Under no circumstances shall this material be discharged, stored, or deposited on the ground, swale, road, or open environment.**

C. The Contractor shall take appropriate steps to ensure that all pumps, piping, and hoses that carry raw wastewater are protected from traffic. Traffic control shall be performed in accordance with the requirements of the governing agency.

D. Prior to any wastewater flow control operations the Contractor will identify the pump station/s and lowest overflow point upstream of the planned plugging/blocking or bypass/diversion. During operations the Contractor will monitor the pump stations and lowest points to ensure overflow does not occur.

E. In the event, during any form of "Wastewater Flow Control," that raw wastewater is spilled, discharged, leaked, or otherwise deposited in the open environment the Contractor shall be responsible for any cleanup of solids and stabilization of the area affected. This work shall be performed at the Contractor's expense with no additional cost to the County. The Contractor shall also be responsible for notifying the County's sewer system maintenance personnel and complying with any and all regulatory requirements for cleaning up the spill at no additional cost to the County.

F. During wastewater flow control operations; the Contractor shall take proper precautions to prevent damage to existing sanitary sewer facilities, flooding, or damage to public or private property.

G. The Contractor shall make repairs, replacements or rebuilds, as directed by the County, to any portion of the sewer system damaged during any plugging or bypass/diversion pumping operation. All such repairs, replacements, and rebuilding shall be paid for by the Contractor.

H. The Contractor shall make such provisions as are necessary for handling all flows in existing sewers, connections, and manholes by pipes, flumes, or by other approved methods at all times, when his operations would, in anyway, interfere with normal functioning of those facilities.

I. The Contractor shall be responsible for the removal of any debris and sedimentation in the existing sewers, laterals, and manholes, etc., which is attributable to his work under this Contract. The Contractor is responsible for the proper disposal of these items.

J. The Contractor in strict accordance with OSHA and any applicable local safety requirements shall perform all operations. Particular attention is directed to safety regulations for excavations and entering confined spaces.

K. It is the Contractor's responsibility to notify in writing any property owner and/or resident having a sewer service connection on the sewer being rehabilitated or replaced. The Contractor shall notify property owners 24 to 72 hours prior to commencing sewer rehabilitation or replacement. The Contractor shall be solely responsible for any damage caused by property service connection backups caused by the sewer rehabilitation operations.

END OF SECTION

SECTION 02936
GRASSING

1 GENERAL

1.1 SCOPE

A. This section covers preparation of subsoil, placing of topsoil, grassing construction, protection, maintenance, guarantee and replacement of grassing, and related items necessary for the establishment of a suitable stand of grass in areas disturbed by the construction.

1.2 SUBMITTALS

A. Certification of Grass Seed: Submit seed vendor's certified statement for each grass seed mixture required, stating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed for each grass seed species.

1.3 DELIVERY, STORAGE, AND PROTECTION

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.4 MAINTENANCE

A. Provide service and maintenance of seeded areas until final completion and closeout of the project.

B. Maintenance includes re-fertilization, weeding, mowing, watering, clean up, repair of all washouts, and gullies.

1.5 ACCEPTANCE

A. Establish a uniform stand of the specified grass with scattered bare spots, none of which is larger than one square foot, allowed up to a maximum of 3% of any grassed area.

B. It shall be the responsibility of the Contractor to repair any erosion damage to the grassed area until the date of final acceptance.

2 PRODUCTS

2.1 MATERIAL STANDARDS

A. Use materials that meet the requirements of the following Georgia Department of Transportation Standard Specifications:

1.	Wood Fiber Mulch	DOT Sec. 718.2
2.	Emulsified Asphalt	DOT Sec. 822
3.	Agricultural Lime	DOT Sec. 882.2.01
4.	Seed	DOT Sec. 890.2.01
5.	Sod	DOT Sec. 890.2.02
6.	Fertilizer	DOT Sec. 891.2.01
7.	Plant Topsoil	DOT Sec. 893.2.01
8.	Mulch	DOT Sec. 893.2.02
9.	Inoculants	DOT Sec. 893.2.04
10.	Tackifiers	DOT QPL 33

2.2 SEED MIXTURE

A. The seed mixture will be selected based on the geographic zone, the time of planting and the desired species of permanent grassing. This project is located in DOT Zone 2. Whenever seeds are specified by their common names, use the strains indicated by their botanical names. Use inoculants as required based on the type of seed. See Section 700 of Georgia DOT Standard Specifications for required seed mixture and planting times to achieve the permanent types of grass for each area of the project listed below.

B. Permanent grassing species to be Common Bermuda. A permanent stand of grass is required on all exposed slopes and areas adjacent to the approach road and turn-around. Areas below water level and areas around the edge of the river and reservoir do not require permanent grassing.

C. Temporary Grassing may be required if planting is needed at a time when the desired permanent grassing cannot be seeded according to Section 700 of Georgia DOT Standard Specifications. Any temporary grassing must be approved by Engineer.

D. When grassing right-of-way adjacent to existing lawns, use the same type of grass as is present on the lawn.

a. SOIL MATERIALS

A. Conserve and stockpile the best topsoil from the site for use on grassed areas. If necessary to achieve the specified stand of grass, Contractor shall haul in topsoil from offsite.

2.4 ACCESSORIES

A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry.

B. Fertilizer: Use a balanced commercial fertilizer mixed grade such as 10-10-10, 6-12-12, 5-10-15, or other analysis and apply at the rate per acre needed based on soil test results.

C. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

D. Erosion Fabric: Where required to contain erosion, install a biodegradable matting

E. Lime: Use agricultural lime.

2.5 TESTS

A. Soil samples shall be taken and tested to determine grade and rate of application rates of fertilizer and lime.

3 EXECUTION

3.1 EQUIPMENT

A. Use grassing equipment able to produce the required results.

3.2 PREPARATION OF SOIL

A. Prepare the ground by plowing under any temporary grass areas and preparing the soil as follows:

1. Slopes 3:1 or Flatter:
   a. Plow shoulders and embankment slopes to between 4 in and 6 in deep. In cut areas, plow to no less than 6 in deep. After plowing, thoroughly disk the area until pulverized to the plowed depth.

2. Slopes Steeper Than 3:1
   a. Prepare the ground to develop an adequate seed bed using any of the following methods: Plow to whatever depth is practicable. Use a spiked chain. Walk with a cleated track dozer. Scarify.

B. Remove boulders, stumps, large roots, large clods, and other objects that interfere with grassing or mowing.

C. Spread topsoil stockpiled during grading evenly over cut and fill slopes after preparing the ground and just before seeding is scheduled.

1. Slopes on the dam shall have topsoil to a minimum depth of 4 inches.

2. If sufficient topsoil is available, it shall be spread over areas of the roadway that are to receive grass. Take care to notch out shoulders or leave below grade so that topsoil does not cause ponding against the edge of the travel surface.

3.3 FERTILIZER AND LIME

A. Apply fertilizer and lime at the recommended rate per acre in accordance with soil test results. Mix thoroughly in the top several inches of soil using harrows, tillers or other suitable equipment.

3.4 SEEDING

A. Inoculate Seed.

1. Inoculate each kind of leguminous seed separately with the appropriate commercial culture according to the manufacturer's instructions for the culture. When hydroseeding, double the inoculation rate. Protect inoculated seed from the sun and plant it the same day it is inoculated.

B. Sowing

1. Weather permitting, sow seed within 24 hours after preparing the seed bed and applying the fertilizer and lime.

2. Sow seed uniformly at the rates specified in the GA DOT Seeding Table for the specified type of permanent stand of grass.

3. Use approved mechanical seed drills, rotary hand seeders, hydraulic equipment, or other equipment to uniformly apply the seed. Do not distribute by hand.

4. To distribute the seeds evenly sow seed types separately, except for similarly sized and weighted seeds.

C. Rolling

1. Roll seeded areas before applying mulch, except on steep slopes where rollers cannot operate satisfactorily. On slopes inaccessible to compaction equipment, cover the seeds by dragging spiked chains over them or by using other methods.

2. Do not sow during windy weather, when the prepared surface is crusted, or when the ground is frozen, wet, or otherwise non-tillable.

D. Hydroseeding

1. Hydroseeding may be used on any grassing area. Under this method, spread the seed, fertilizer, and wood fiber mulch in the form of slurry. Seeds of all sizes may be mixed together. Inoculate the seeds at double the rate for seeds not being hydroseeded. Apply hydroseeding as follows:

a. Use wood fiber mulch as a metering agent and seed bed regardless of which mulching method is chosen.
b. Apply wood fiber mulch at approximately 1,500 lbs/acre.
c. Prepare the ground for hydroseeding as for conventional seeding.
d. Use specially designed equipment to mix and apply the slurry uniformly over the entire seeding area.
e. Agitate the slurry mixture during application.
f. Discharge slurry within one hour after being combined in the hydroseeder. Do not hydroseed when winds prevent an even application.
g. Closely follow the equipment manufacturer's directions.
h. Mulch the entire hydroseeded area.

3.5 MULCHING

A. Evenly apply straw or hay mulch between 3/4 in and 1-1/2 in deep, according to the texture and moisture content of the mulch material.

B. Mulch shall allow sunlight to penetrate and air to circulate as well as shade the ground, reduce erosion, and conserve soil moisture. If the type of mulch is not specified on the Plans or in the Proposal, use any of the following as specified.

1. Mulch with Binder. Apply mulch with binder regardless of whether using sowing or hydroseeding methods for seeding. Apply manually or with special blower equipment

designed for the purpose. When using a blower, thoroughly loosen baled material before feeding it into the machine so that it is uniformly coated with binder and broken up. After distributing the mulch initially, redistribute it to bare or inadequately covered areas in clumps dense enough to prevent new grass from emerging. Do not apply mulch on windy days. Apply enough binder to the mulch to hold it in place. Immediately replace mulch that blows away. When using a power blower to distribute the mulch, spray the binder onto the mulch as the mulch is ejected from the machine. If distributing the mulch by hand, immediately apply the binder uniformly over the mulched areas. Use one of the following binders: Emulsified asphalt, SS-1h or SS-1 (DOT Section 822); or use a tackifier listed in the Laboratory Qualified Products Manual. Follow manufacturer's recommended rates.

2. Mixed-in-Place Mulch. Apply mixed-in-place mulch on flat areas or slopes 3:1 or less and treat as follows:

   a. Immediately work the mulch into the soil with appropriate equipment to produce a loose soil and mulch mixture 3 in to 3.5 in (75 mm to 90 mm) deep.
   b. After mixing mulch and soil and restoring areas to line and grade, seed as specified in this Section.

3. Walked-in-Mulch

   a. Apply walked-in-mulch on slopes ranging in steepness from 5:1 to 2:1 and treat as follows:
   b. Immediately walk it into the soil with a cleated track dozer. Make dozer passes vertically up and down the slope.
   c. Where walked-in-mulch is used, do not roll or cover the seeds.

C. Cover seeded slopes where grade is 2:1 or greater with an approved erosion fabric installed according to manufacturer's recommendations.

3.6 MAINTENANCE

A. After the grass has grown to a height of 2 inches and before final acceptance, one additional application of nitrogen at the rate of 50 lbs/acre must be applied.

B. Apply nitrogen with mechanical hand spreaders or other approved spreaders capable of uniformly covering the grassed areas. Do not apply nitrogen on windy days or when the foliage is damp. Do not apply nitrogen between October 15 and March 15 except in Zone 4. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.

C. Water to prevent grass and soil from drying out.

D. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.

E. Immediately reseed areas that show bare spots.

F. Apply fertilizer at approximately 600 lbs/acre each spring after initial plant establishment until Final Acceptance.

G. The Engineer may require replanting of an area that shows unsatisfactory growth for any reason at any time. Except as otherwise specified or permitted, prepare replanting areas according to the Specifications as if they were the initial planting areas. Grassed areas will be considered acceptable when a viable stand of grass covers at least 98% of the total area with no bare spots exceeding one square foot and the ground surface is fully stabilized against erosion.

** END OF SECTION **

DIVISION 3 – CONCRETE

SECTION 03000
REINFORCED CONCRETE

PART 1 GENERAL

1.01 WORK INCLUDED

Concrete, forms, placing of sleeves, pipes, and anchor bolts, finishing, curing, and all equipment and incidentals necessary to do all the concrete work as shown on the drawings or specified.

1.02 REFERENCE STANDARDS

All work hereunder shall comply with the following except as called for otherwise herein:

A. ACI Standard 301- Latest Revision Specifications for Structural Concrete for Buildings.

B. ACI Standard 318 - Latest Revision Building Code Requirements for Reinforced Concrete.

C. ACI Standard 306R - Latest Revision Cold Weather Concreting.

D. ACI Standard 305R - Latest Revision Hot Weather Concreting.

E. ACI Standard 304R - Latest Revision Guide for Measuring, Mixing, Transporting and Placing Concrete.

1.03 SUBMITTALS

A. Shop Drawings: Submit complete Shop Drawings including:

1. Location of all proposed construction joints, keying, and water stops.

2. Location of all openings, depressions, construction and control joints, trenches, sleeves, inserts, and other items affecting the reinforcement and placing of concrete.

B. Product data: Submit complete product data on the following:

1. Complete materials list of items proposed to be furnished and installed under this section.

2. Complete information on cement source of supply, physical and chemical characteristics, transportation and intermediate terminating procedures for mill-to-site handling, and site storage procedures.

3. Complete information on aggregate procurement, processing, and storage.

4. Complete information on proposed batching and mixing equipment and procedures, including water chilling or other devices or systems to reduce mix temperatures.

5. Complete information on concrete handling equipment proposed to be used, including capacities, for chutes, pumps, tremies, buckets, and all other equipment.

6. Complete description of proposed curing materials and methods.

7. Complete mix designs.

8. Remolded joint filler.

9. Waterstops.

10. Wedge inserts.

11. Expansion bolts.

12. Anchor bolts.

13. Foundation bolts.

14. Admixtures.

15. Hardening and dust-proofing compounds.

16. Form ties.

17. Any gang forming information.

C. Do not begin concrete production until all products and mix designs have been reviewed and approved by the Engineer.

1.04 SUBMITTALS

The following classes of concrete are included in these specifications and shall be used where specified herein or called for on the plans:

	Class "A" Concrete	Class "B" Concrete
Cement content - Minimum number of sacks (94 lb.) per cubic yard	6	5
Maximum water to cement ratio (gal. Water per sack cement)	5.1	6.5
Entrained air	3% - 6%	3% - 6%
Minimum Superplasticizer content per 100 lbs. of cement	45 oz.	0 oz.
Minimum 7 day compressive strength	2,400 psi	1,400 psi
Minimum 28 day compressive strength	4,000 psi	2,500 psi

B. In the absence of contrary designation, concrete used for all construction shall be Class "A."

PART 2 PRODUCTS

2.01 CEMENT

Unless otherwise specified or shown on the plans, concrete shall be made with the Portland cement conforming to A.S.T.M. Specification C-150, Type I. The lightest colored Portland cement, competitively available shall be used, and the same brand of cement shall be used throughout the entire project. High early strength Portland cement shall conform to A.S.T.M. Standard Specification #C-150, Type III.

2.02 AGGREGATES

A. General: All aggregates shall conform to requirements of ASTM C 33.

B. Fine Aggregate

1. The fine aggregate shall consist of clean, hard, durable, uncoated particles of sand. It shall be free from dust mica, shale, alkali, organic matter, and loam, soft or flaky particles.

2. Deleterious Substances - The fine aggregate shall contain not more than one percent (1%) by weight of clay lumps of more than three percent (3%) by weight of material removed by decantation.

3. Grading - Fine aggregate shall conform to the following requirements:

Total Passing	Percent by Weight
3/8" sieve	100
No. 4 sieve	95 - 100
No. 16 sieve	45 - 95
No. 50 sieve	10 - 30
No. 100 sieve	2 - 8

4. Tests - Fine aggregate shall be subjected to the Colorimetric test for organic impurities and if it produces a color darker than the standard, it shall be rejected. It shall conform in all other respects to A.S.T.M. Designation C-33.

C. Coarse Aggregate

1. Composition and Quality - Coarse aggregate shall be washed gravel or crushed stone and shall consist of hard, tough, uncoated, durable particles. It shall contain no vegetable matter or soft, flaky, thin, or elongated particles. Deleterious substances shall not exceed the following amounts:

Soft fragments	0.20%
Coal and lignite	0.25%
Clay lumps	0.25%
Material passing No. 200 Sieve	1.50%
Thin or elongated pieces (length greater than 5 times the average thickness)	10.00%

The percentage of wear, by the Los Angeles test, shall not exceed 45.

2. Grading - Coarse aggregate shall be well graded between the limits specified below, and shall conform to the limits shown in the following table:

Total Passing	Percent by Weight
2" Sieve	100
1-1/2" Sieve	90 - 100
1" Sieve	55 - 80
3/4" Sieve	35 - 70
1/2" Sieve	20 - 45
3/8" Sieve	10 - 30
No. 4 Sieve	0 - 15
No. 16 Sieve	0 - 1

2.03 WATER

The water used in mixing concrete shall be fresh, clean, potable and free from oil, acid, alkali, organic matter, and deleterious amounts of chloride ion.

2.04 CONCRETE ADMIXTURES

A. Admixtures shall conform to ASTM C494; Type F for high range water-reducing and Type G for high range water-reducing/set-retarding. Air entraining agents shall conform to ASTM C260. When more than one admixture is used the two products shall be compatible and have a single manufacturer.

B. All Class "A" Concrete shall contain a (Daracem - 100 or an alternate approved by the Engineer) high range water-reducing agent. The dosage of the high range water reducing agent shall be at least 8 oz./100 lbs. of cement, but shall not produce a plasticized slump greater than 8". The high range water reducing agent shall be added at the site prior to concrete placement.

C. Admixtures, if not specified, may be used only upon written approval of the Engineer and shall be used only as recommended by the Manufacturer. Admixtures shall, when added to the mixture, produce a concrete of specified strength in both 7 and 28 day tests. Documentary evidence of acceptability will be required when new or unknown admixtures are proposed for usage.

D. Admixtures shall be Grace Construction Products or an alternate approved by the Engineer.

2.05 FORM WORK

A. Forms shall result in a final structure which conforms to the shape, lines, and dimensions of the members as required by the plans and specifications, and shall be

substantial and sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together so as to maintain position and shape. Forms and their supports shall be designed so that previously placed structure will not be damaged.

Form ties shall be so designed that when the forms are removed no metal shall be within 1-1/2 inches of the finished surface. Form ties shall have an approved type waterstop that is an integral part of the tie and made of the same material as the tie. Gang form ties shall be filled from one end with a compressible plug a minimum of 1 1/2 inches from the edge of wall, shall have a bentonite plug in the center of the wall and all voids filled with non-shrink grout. Removal of forms and shores - no construction loads exceeding the dead load plus live load shall be supported on any unshored portion of the structure under construction. No construction loads shall be supported on, nor any shoring removed from, any part of the structure under construction except when that portion of the structure in combination with the remaining forming and shoring system has sufficient strength to support safely its weight and the loads placed thereon. This strength may be demonstrated by job-cured test specimens and by a structural analysis considering the proposed loads in relation to these test strengths and the strength of the forming and shoring system. Such analysis and test data shall be furnished by the contractor to the Engineer when so required. In no case shall forms for walls or columns be removed in less than 36 hours. Form work supporting weight of concrete, such as beams and slabs shall remain until the concrete has attained a minimum of the 28 day design strength.

B. The design and engineering of the form work, as well as its construction, shall be the responsibility of the Contractor. Except as specifically called for otherwise herein, all form work shall meet the "ACI Standard Recommended Practice for Concrete Form work (ACI 347 - Latest Revision)".

C. Chamfer: Unless shown otherwise, form chamfers with 3/4" x 3/4" strips, accurately formed and surfaces to produce uniformly straight lines and tight edge joints on exposed concrete. Extend terminal edges to required limit and miter chamfer strips at changes in direction. All exposed corners shall be chamfered.

PART 3 - EXECUTION

3.01 PREPARATION

A. Before the placing of any concrete, the footing trenches shall be drained of water and mud film removed and any loose dirt lifted out. Any flow of water shall be diverted by side drains to a sump, or removed by other approved methods, while the concrete is being placed.

B. Before placing concrete in any forms, the forms shall be cleaned, and all debris shall be removed. All reinforcing shall be checked to be sure that no reinforcing is touching the form or pan sides.

C. Before placing any concrete, it shall be determined that all work that is to be built into the concrete work is located and installed. All such items shall be placed so as not to interfere with the reinforcing steel.

D. Wood board forms shall be soaked with water just before the concrete is poured.

E. Special measures shall be taken in both severe cold and hot weather and shall be in accordance with ACI Recommended Practice (ACI 306 - Latest Revision and ACI 605 - Latest Revision).

F. Before placing any new concrete on or against concrete which has set, the existing surfaces shall be thoroughly roughened and cleaned of all foreign matter and "Laitance." Forms shall be retightened and the existing surfaces slushed with a coat of grout. The new concrete shall be placed immediately after grouting, and the work shall be performed in such manner as to insure complete bonding of newly poured concrete to the existing work.

Grout for construction joints shall consist of a mixture of neat cement and water, and shall be applied to the old concrete surface immediately before the new concrete is poured. Grout for setting column bases, wall plates, and beams shall be composed of one part Portland cement two parts sand, and sufficient water to produce the consistency required.

G. Where excavations exceeding a depth of five feet are prescribed to be made to install the foundations or any part of the structure, or any retaining walls on the site, the back slope of such excavation shall be at an incline not exceeding one vertical to one and one-half horizontal unless such back slope is sheeted and braced. If sheeting and bracing is to be provided, such sheeting and bracing shall be designed by an Engineer registered in the project state. The cost of such design work shall be paid for by the Contractor.

3.02 MIXING AND DELIVERY

A. Machine Mixing: All mixing of concrete shall be done in a batch mixer of approved design, which will insure a uniform distribution of the material throughout the mass, so that the mixture is uniform in color and homogenous. The entire content of the mixer drum shall be discharged before recharging. All material to be mixed per batch shall not exceed the manufacturers' rated capacity of the mixer.

B. Time of Mixing: The mixing of each batch shall continue not less than one and one-half (1-1/2) minutes after all the materials, including water, are in the mixer, during which time the mixer shall rotate at a peripheral speed of about two hundred feet per minute.

C. Mixing at Central Plant: Concrete mixed in a central plant, shall be conveyed to the work in approved mixer trucks which mix the concrete in route to the work. Plant layout and equipment shall meet the approval of the Engineer. Loading tickets shall be initialed and the time of loading stamped thereon. The loading tickets shall be handed to the resident inspector on the work before the load is placed, and no concrete will be accepted which has been in the mixer truck more than one and one-half (1-1/2) hours after the water has been added. In all other respects, ready-mixed concrete shall conform to A.S.T.M. Specification C-94.

D. Waste concrete shall be deposited and mix trucks washed out only in areas designated by the owner or the engineer.

3.03 SLUMP

A. The maximum slump allowed for the various types of construction are as follows:

Type of Construction	Maximum Slump
Reinforced Foundation Walls & Footings	4"
Slabs, Beams, Reinforced Walls & Columns	4"
Heavy Mass Construction	2"
All Concrete Plasticized by Admixtures	8"

B. Slump tests shall be made at the discretion of the Engineer, and concrete having greater slump than specified shall not be incorporated into the work. The Contractor shall furnish slump test cones conforming to the provisions of ASTM C-143.

3.04 PLACING CONCRETE

A. All concrete shall be placed in daylight, and any portion of the concrete work started shall be started so that it can be completed in daylight. No concrete shall be placed until the foundation, forms, false-work, and the placing of the steel have been approved by the Engineer. Approval by the Engineer in no manner relieves the

Contractor of his obligation to produce finished concrete as required by the plans and specifications.

B. The concrete shall be placed in such a manner as to avoid the possibility of segregation or separation of the aggregates, or the displacement of the reinforcement steel. The concrete shall be placed as near its final resting place as possible. If pipes, troughs, or chutes are used in placing the concrete, they shall be so arranged and used that the concrete is not separated, and shall be kept clean and free of hardened concrete at all times. Troughs and chutes shall be either made of metal or shall be metal lined, and shall extend as nearly as possible to the point of deposit. In walls and columns, the concrete shall not be dropped more than five feet (5') without the use of a tremie. Concrete shall be placed in continuous horizontal layers, approximately 10" to 12" thick, and the batches shall follow each other so closely that each one is placed and compacted before the preceding one has taken an initial set. Succeeding layers shall be placed before the underlying layer has become set, and shall be compacted in a manner that will entirely break up and obliterate the tendency to produce a cold joint between layers. Concrete in beams, girders, columns and walls shall be well spaded at the form surface and all concrete shall be compacted by an approved mechanical type vibrator having a frequency of not less than 3,000 vibrations per minute. The Contractor shall provide the necessary number of vibrators to properly execute the work, and shall have on the job at all times necessary spare vibrators to be used in case of mechanical failure. Construction joints shall be made only at the location as shown on the plans, except by approval of the Engineer.

C. In making construction joints, the previous work shall be cleaned of all "laitance," and other objectionable material, and shall be brushed with a thin mixture of Portland cement and water immediately before the new concrete is placed.

D. The operation of placing and compacting the concrete, shall be conducted so as to form a compact, dense, impervious artificial stone of uniform texture, with smooth faces on exposed surfaces. Any section of concrete that is porous, or has been plastered, or is otherwise defective, shall be removed and replaced, in whole or in part, entirely at the contractor's expense, as directed by the Engineer.

E. Depositing Concrete Under Water: Concrete shall not be exposed to the action of water before setting, or deposited in the water, except upon the approval of the Engineer, and under his supervision.

F. Cold Weather Placing

1. Comply with ACI 306 to protect all concrete work from physical damage and reduced strength which would be caused by frost, freezing actions, or low

temperatures. No concrete shall be placed when the atmosphere temperature is below 40 degrees F.

2. If the temperature drops below 40 degrees F. after the concrete has been placed, the Contractor shall provide adequate means for maintaining concrete temperature of not less than 45 degrees F. for a period of five (5) days after the concrete is placed. The contractor shall assume all risk connected with placing concrete in cold weather, and any unsatisfactory work will be rejected. Recording thermometers shall be supplied by the contractor as required by the Engineer.

G. Hot Weather Placing: When hot weather conditions exist which would seriously impair the quality and strength of concrete, place the concrete as follows:

1. Maintain concrete temperature at time of placement below 90 degrees F. Use chilled mixing water or chopped ice to control concrete temperature, provided the water equivalent of the ice is calculated to the total amount of water.

2. Cover reinforcing steel with water-soaked burlap if the steel becomes too hot. Steel temperature shall not exceed the ambient air temperature immediately prior to placement of concrete.

3. Wet forms thoroughly prior to placement of concrete.

4. Use set-control admixtures in the mix subject to approval of the Engineer.

3.05 PROTECTION AND CORRECTIVE WORK

A. Workmen shall not walk on concrete during placing or finishing with any earth or foreign matter footgear.

B. All freshly placed concrete shall be protected from damage or injury due to water, falling objects, persons or anything that might mar or injure the finish surface of the concrete. Any surfaces that are damaged shall be removed and replaced with fresh concrete at the expense of the Contractor.

C. Care shall be taken in the removal of the forms not to damage the surface of the concrete. Immediately after the forms are removed, all damaged or imperfect work shall be patched. If in the opinion of the Engineer, the patching does not restore the work to the quality specified, the Contractor shall remove and rebuild the work at his expense.

D. Where concrete or concrete work does not conform to these specifications and where patching is not approved by the Engineer or low strength concrete is not permitted to remain in place, procedures and plans covering all work to be rebuilt shall be submitted by the Contractor to the Engineer before removal and rebuilding is begun. The cost of such plans, as well as the cost of removal and rebuilding shall be at the Contractor's expense.

3.06 FINISHING

Floors, including slabs on ground, shall be finished as follows:

A. The surfaces of all concrete shall be worked with a wood float in a manner which will compact the concrete and produce a surface free of depressions or inequalities of any kind. Test for grade (of level) and correct by removing excess or adding and compacting additional concrete.

B. All interior floor slabs shall receive steel trowel finish as follows: After screeding, slab shall be wood floated to a smooth, plane surface. When concrete has hardened, to prevent excess fines from working to surface, steel trowel to a smooth surface free from defects. A second steel troweling shall be done producing a plane, hard, dense, finished surface. Interior slabs shall also receive a hardening and dust proofing treatment of a colorless aqueous solution of zinc or magnesium fluosilicate applied in strict accordance with manufacturer's recommendations.

C. Troweling shall not begin until all surface water has disappeared. The drying of the surface moisture before troweling must proceed naturally and must not be hastened by sacking or dusting on of dry sand and cement.

D. After exterior floors, platforms and steps requiring a broom finish are struck off smooth with a wood float and received a trowel finish, slightly roughen the concrete surface by brooming in the direction perpendicular to the main traffic route. Use a fiber bristle broom.

D. Exposed concrete surfaces shall be finished as follows:

1. The exterior surfaces of all concrete shall be thoroughly worked during the placing operation, by the use of a concrete spade of approved type. The working shall force all coarse aggregate from the faces, and work mortar against the forms to produce a smooth finish, free from water and air pockets, or honeycomb. As soon as the concrete has set sufficiently to permit, the forms shall be carefully removed and all depressions resulting from removal of the metal spacers, and all other holes and rough places, shall be carefully

pointed with a mortar composed of one part cement and two parts sand. The surface film of all such pointed surfaces shall be carefully removed before setting occurs. The cement in the mortar used for pointing and filling holes shall be of the same brand as the cement incorporated in the concrete work.

2. Surface shall be rubbed smooth with carborundum brick or other abrasive within 36 hours after forms are removed. Surfaces shall be wetted and rubbed until a uniform color and texture is produced. No cement grout or slush shall be used other than the cement paste drawn from the green concrete itself by the rubbing process.

G. Unless otherwise directed the following schedule shall be used for concrete finishing:

Sidewalks:	Rough (Broomed)
Exposed Exterior Walls:	Medium (Rubbed)
Interior Structure Walls:	Fine (Rubbed)
Additional Wall Finish:	ThoroCoat applied per manufacturer's recommendations
Slabs - Interior:	Smooth (Troweled)
Slabs - Exterior:	Medium (Fine broomed)

Coordinate the required finish with the Engineer prior to application.

3.07 CURING

A. Curing Materials

1. Liquid curing and sealing compounds shall conform to ASTM C 309, Type 1.

2. Sheet materials shall conform to ASTM C 171.

3. Burlap cloth made from jute and weighing approximately 9 oz. per sq. yd for moist curing shall conform to AASHTO M 182 and shall use two layers.

4. Compounds shall be a combination sealer-hardener and dust-proofer.

B. Procedure

Freshly placed concrete shall be protected from wash caused by rain and flowing water. Concrete shall not be allowed to dry out from the time it is placed until seven (7) days thereafter. Curing shall be accomplished by the use of an approved membrane compound to seal the water in the concrete except for surfaces which are

to receive future concrete, or mortar. The membrane shall be of a type which will retain ninety-seven (97%) percent of the moisture at a temperature of 135 degree F., with a relative humidity of thirty percent (30%) in the first twenty-four (24) hours. It shall be applied in accordance with the manufacturer's recommendations and in sufficient thickness to effectively hold the water in the concrete, and must have a record of successful use for at least two years.

3.08 JOINTS

A. Construction Joints:

1. Construction joints will not be permitted except as may be shown on the Drawings and on the Contractor's approved placement schedule.

2. If construction joints necessary for the progress of the Work are not shown on the Drawings, show them in complete detail on the Shop Drawings.

3. Provide keyways at least 1-1/2" deep where shown on the plans.

B. Isolation joints in slabs on grade:

Provide isolation joints in slabs on grade at points of contact between slabs on grade and vertical surfaces where indicated.

3.09 WATER TIGHTNESS

All structures for holding or carrying water, or pits below grade shall be watertight. Where the order of work requires "cold" joints (slab/wall intersections etc.), an approved, rigid waterstop shall be secured to the form work and remain imbedded in the concrete to form a watertight joint with the adjacent pour. Waterstop shall be expandable center bulb type 6 in. wide x 1/4 in. thick minimum unless otherwise specifically shown on the Plans.

3.10 TESTING OF CONCRETE

A. Testing of concrete will be done under the direction of a laboratory approved by the Engineer. Tests to be paid for by the Contractor.

B. Samples for strength tests will be taken not less than one per day nor less than once per one hundred (100) cubic yards and on less yardage when required by the Engineer. The tests shall be made in accordance with the procedure set forth in A.S.T.M. C172 for "Standard Method of Making and Storing Compression Test Specimens of

Concrete in the Field", and C-39 for "Standard Methods of Test for Compressive Strength Concrete." Tests shall be made by a recognized laboratory approved by the Engineer.

Three certified copies of test results are to be furnished the Engineer with each test. Each test shall consist of at least four specimens, two for field control and two for laboratory control. Each set of four cylinders shall have a numerical designation and each cylinder an alphabetical sub-designation. Thus the first set of four cylinders shall be numbered 1A, 1B, 1C, and 1D.

C. If the evaluation of the compressive test indicates the concrete has failed to meet the specified strength, core tests shall be made of the in-place concrete. The location and number of such tests to be at the Engineers direction. Tests shall be paid for by the Contractor.

D. If the core tests fail to verify the strength specified, the Engineer shall effect one of the following procedures:

1. Have the Contractor remove and reconstruct that portion of the structure found to be defective.

2. Accept the concrete in place and issue a change order as set forth in the General Conditions of these specifications.

E. Tests to determine the entrained air content will be made at the job site. Frequency of testing shall be at the Engineer's discretion as necessary to ensure proper air content. The testing apparatus shall be furnished by the Contractor, concrete supplier or testing laboratory at no cost to the Owner, and testing will be performed by the Contractor in the presence of the Engineer.

END SECTION

SECTION 03200
CONCRETE REINFORCEMENT

1.00 DESCRIPTION

A. Work Included: Provide complete, in place, all steel required for reinforcement of cast-in-place concrete as shown on the drawings.

1.01 SUBMITTALS

A. Shop Drawings: Submit complete shop drawings of all material proposed to be furnished and installed under this Section.

1. Show schedules, stirrup spacing, diagrams of bent bars and arrangement and assemblies.

2. Make Shop Drawings in accordance with ACI 315.

B. Mill Certificates: Accompanying the Shop Drawings, submit steel producer's certificates of mill analysis, tensile and bend tests for reinforcing steel.

1.02 PRODUCT HANDLING

A. Delivery: Deliver reinforcement to the job site bundled, tagged and marked. Use tags indicating bar size, lengths, and other information corresponding to markings shown on placement diagrams.

B. Storage: Store reinforcement above the surface of the ground on wooden platforms or other supports in a manner which will prevent damage and accumulation of dirt and excessive rust. The surface of the ground beneath all stored reinforcement shall be covered with plastic sheeting to further assure isolation from dirt and dust.

2.00 MATERIALS

A. Reinforcing bars: Comply with ASTM A615-Latest Revision.

B. Welded wire fabric: Comply with ASTM A185-Latest Revision.

C. Supports for reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place:

1. Use wire bar type supports complying with CRSI recommendations, unless otherwise indicated. Do not use wood, brick and other unacceptable materials.

2. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support legs.

3. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with either hot-dip galvanized or plastic protected legs.

2.01 FABRICATION

A. General: Fabricate reinforcing bars to conform to required shapes and dimensions, with fabrication tolerances complying with CRSI Manual. In case of fabricating errors, do not rebend or straighten reinforcement in a manner that will injure or weaken the material.

B. Unacceptable Materials: Reinforcement with any of the following defects will not be permitted in the work.

1. Bar lengths, depths and bends exceeding specified fabrication tolerances.

2. Bend or kinks not indicated on Drawings or final Shop Drawings.

3. Bars with reduced cross-section due to excessive rusting or other cause.

3.01 INSPECTION

Examine the foundation, formwork and the conditions under which concrete reinforcement is to be placed, and correct conditions which would prevent proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General

1. Comply with the specified standards for details and methods of reinforcement placement and supports, and as herein specified.

2. Clean reinforcement to remove loose rust and mill scale, earth and other materials which reduce or destroy bond with concrete.

3. Position, support and secure reinforcement against displacement by formwork, construction or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers as required.

4. Place reinforcement to obtain the minimum coverage for concrete protection. Arrange, space and securely tie bars and bar supports together with 16 gage wire to hold reinforcement accurately in position during concrete placement operations. Set wire ties

so that twisted ends are directed away from exposed concrete surfaces.

5. Install welded wire fabrics in as long lengths as practicable. Lap adjoining pieces at least one full mesh.

6. Provide sufficient numbers of supports and of strength to carry reinforcements. Do not place reinforcing bars more than 2" beyond the last leg of any continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

B. Splices: Provide standard reinforcement splices by lapping ends, placing bars in contact, and tightly wire tieing. See splice schedule on Drawings. Bars marked continuous shall be lapped as required by splice schedule, and at corners, corner bars shall be provided.

3.03 BAR COVER

Reinforcing bars shall be fabricated, tied and supported to ensure a protective concrete cover as shown on the structural drawings.

END OF SECTION