



**Barrow County Board of Commissioners
30 North Broad Street
Winder, GA 30680**

**REQUEST FOR BIDS
RFB 2015-6**

**TANNERS BRIDGE ROAD
LAND APPLICATION SYSTEM
MECHANICAL SCREENING FACILITIES
(Project #SS016)**

BARROW COUNTY, GEORGIA

DECEMBER 17, 2014

**BID DOCUMENTS
RFB2015-6**

**TANNERS BRIDGE ROAD LAND APPLICATION SYSTEM
MECHANICAL SCREENING FACILITIES (PROJECT #SS016)**

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SECTION I ADVERTISEMENT FOR BIDS

Project: Tanners Bridge Road LAS Mechanical Screening Facilities – Project #SS016 (RFB2015-6)
OWNER: Barrow County Board of Commissioners

Sealed bids will be received by the Barrow County Board of Commissioners, Winder, Georgia, for the Tanners Bridge Road LAS Mechanical Screening Facilities (Project #SS016), in accordance with the specifications and drawings.

Bids will be received in the office of the Barrow County Board of Commissioners, Clerks Office, 30 North Broad Street, Winder, Georgia 30680, **until 12:00 Noon, Thursday, January 15, 2015**. Any bid received after said time and date will not be considered by OWNER. Bids will be opened and read aloud in the Commission Meeting Room at the above address at 2:00 p.m. on Thursday, January 15, 2015. All bids will be evaluated and the project will be awarded, if it is awarded, within 60 days of the bid opening to the lowest responsible, qualified general contractor.

Construction Documents and Specifications can be downloaded in accordance with directions furnished on the Purchasing Department Web Page at www.barrowga.org. Neither companies nor representatives or agents of companies shall contact any members or employees of the Engineering Firm, Barrow County Board of Commissioners, or any Barrow County Elected Official regarding this RFB without prior authorization of Purchasing Agent. All questions/inquiries are to be submitted in writing to the following and will be answered and made available in accordance with instructions from Purchasing Department web page.

Cindy Clack, Purchasing Agent
Barrow County Board of Commissioners
30 North Broad Street
Winder, GA 30680
E-Mail – cclack@barrowga.org

Questions regarding this RFB shall be received no later than 5 :00 p.m. on Monday, January 5, 2015.

Each bid must be in accordance with specifications and must be submitted in a sealed envelope addressed to the OWNER. License numbers must be written on the face of the envelopes. No bid will be opened unless it contains the Contractor's utility license number. Each sealed envelope containing a bid must be plainly marked on the outside as **"RFB2015-6 – Tanners Bridge Road LAS Mechanical Screening Facilities"**. If a bid is forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope to the attention of the OWNER at the address previously given and also plainly marked with **"RFB2015-6 – Tanners Bridge Road LAS Mechanical Screening Facilities"**. General contractor must fully comply with Barrow County insurance requirements. All bids must be accompanied by a Bid Bond in the amount of 5% of the Bid Amount. Both a Performance and a Payment Bond will be required in an amount equal to 100% of the Contract Price. Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in Georgia. Only Barrow County Bid, Payment and Performance Bond Forms Are Acceptable.

OWNER reserves the right to waive any informality or to reject fully or partially any or all bids, to evaluate bids, and to accept any bid which, in its opinion, may be in the best interest of the OWNER. No bid will be rejected without just cause.

Randall Dowling, County Manager
BARROW COUNTY BOARD OF COMMISSIONERS

SECTION II

INSTRUCTIONS TO BIDDERS

1. Defined Terms: Terms used in these Instructions to Bidders which are defined in the General Conditions have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to OWNER, as distinct from a sub-bidder, who submits a bid to a Bidder. The term "Successful Bidder" means the lowest, qualified, responsible and responsive Bidder to whom OWNER (on the basis of OWNER's evaluation as hereinafter provided) makes an award. The term "Bidding Documents" includes the Advertisement for Bids, Instructions to Bidders, the Proposal and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids.)

2. Copies of Bidding Documents:
 - 2.1 Complete sets of the Bidding Documents in the number and for the sum, if any, stated in the Advertisement for Bids may be obtained from OWNER.
 - 2.2 Complete sets of Bidding Documents must be used in preparing Bids; neither OWNER nor ENGINEER assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
 - 2.3 OWNER and ENGINEER in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the WORK and do not confer a license or grant for any other use.

3. Qualifications of Bidders: To demonstrate qualifications to perform the WORK, each Bidder must be prepared to submit within five days of OWNER's request, written evidence, such as financial data, previous experience, present commitments and other such data as may be called requested. Each Bid must contain evidence of Bidder's qualification to do business in Georgia or covenant to obtain such qualification prior to award of the contract.

4. Examination of Contract Documents and Site:
 - 4.1 It is the responsibility of each Bidder before submitting a Bid to: (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with local conditions that may affect cost, progress, performance or furnishing of the WORK, (c) consider federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the WORK, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify ENGINEER of all conflicts, errors or discrepancies in the Contract Documents.
 - 4.2 Information and data reflected in the Contract Documents with respect to Underground Facilities at or contiguous to the site is based upon information and data furnished to OWNER and ENGINEER by owners of such Underground Facilities or others, and OWNER and ENGINEER do not assume responsibility for the accuracy or completeness thereof.

- 4.3 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, Underground Facilities and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Paragraphs 4.2 and 4.3 of the General Conditions.
- 4.4 On request in advance, OWNER will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations.
- 4.5 The lands upon which the WORK is to be performed, rights-of-way and easements for access thereto and other lands designated for use by CONTRACTOR in performing the WORK are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by CONTRACTOR. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by OWNER unless otherwise provided in the Contract Documents.
- 4.6 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the WORK required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the WORK.
5. Interpretations and Addenda:
- 5.1 All questions about the meaning or intent of the Contract Documents are to be directed to the OWNER as indicated in the Advertisement. Interpretations or clarifications considered necessary by the OWNER in response to such questions will be provided through the Barrow County Purchasing Web Page at www.barrowga.org.
- Questions received less than ten days prior to the date for opening of Bids may not be answered. Oral interpretations or clarifications of questions are not binding. Only written answers, in formal Addenda form, will be binding.
- 5.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable or necessary by OWNER.

6. Bid Security:
 - 6.1 Each Bid must be accompanied by Bid security made payable to OWNER in an amount of five percent (5%) of the Bidder's maximum Bid price and in the form of a Bid Bond issued by a surety meeting the requirements of Paragraph 5.1 of the General Conditions. The Barrow County Bid Bond Form is the only acceptable form for this project.
 - 6.2 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security, whereupon the Bid security will be returned. The Bid security of other Bidders whom OWNER believes to have a reasonable chance of receiving the award may be retained by OWNER until the earlier of the seventh day after the Effective Date of the Agreement or the sixty-first day after the Bid opening, whereupon Bid security furnished by such Bidders will be returned. Bid security with Bids which are not competitive will be returned within seven days after the Bid opening.
7. Contract Time: The number of days within which, or the dates by which, the WORK is to be substantially completed and also completed and ready for final payment (the Contract Time) are set forth in the Proposal and the Agreement.
8. Liquidated Damages: Provisions for liquidated damages are set forth in the Agreement.
9. Substitute or "Or Equal" Items: The materials and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. No substitution will be considered unless written request for approval has been submitted by the Bidder and has been received by ENGINEER at least fifteen (15) days prior to the date for receipt of Bids. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or WORK that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the Bidder. The ENGINEER's decision of approval or disapproval of a proposed substitution shall be final. If ENGINEER approves any proposed substitution, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner. The Bidder shall be responsible for all costs of all changes resulting from any such substitutions.

10. Subcontractors, Suppliers and Others:

- 10.1 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, and other persons and organizations (including those who are to furnish the principal items of material and equipment) to be submitted to OWNER in advance of the specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within seven days after the Bid opening submit to OWNER a list of all such Subcontractors, Suppliers and other persons and organizations proposed for those portions of the WORK for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, person or organization if requested by OWNER. If OWNER or ENGINEER after due investigation has reasonable objection to any proposed Subcontractor, Supplier, other person or organization, either may before the Notice of Award is given request the apparent Successful Bidder to submit an acceptable substitute without an increase in Bid price. If apparent Successful Bidder declines to make any such substitution, OWNER may award the contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers and other persons and organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, Supplier, other person or organization listed and to whom OWNER or ENGINEER does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to OWNER and ENGINEER subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.8.2 of the General Conditions.
- 10.2 No CONTRACTOR shall be required to employ any Subcontractor, Supplier, other person or organization against whom CONTRACTOR has reasonable objection.

11. Proposal:

- 11.1 The Proposal is included with the Bidding Documents.
- 11.2 All blanks in the Proposal must be completed in ink or by typewriter.
- 11.3 Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.
- 11.4 Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.
- 11.5 All names must be typed or printed below the signature.
- 11.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which must be filled in on the Proposal).

- 11.7 The address and telephone number for communications regarding the Bid must be shown.
12. Submission of Bids:
- 12.1 Bids shall be submitted at the time, place, and as specified indicated in the Advertisement for Bids and shall be enclosed in a sealed envelope, marked with the project title, "RFB 2015-6 –Tanners Bridge Road LAS Mechanical Screening Facilities". FAILURE TO COMPLY WITH THIS PARAGRAPH WILL RESULT IN DISQUALIFICATION.
- 12.2 All costs associated with preparation of Bids in response to this RFB will be the responsibility of the bidder and will not be reimbursed by the OWNER.
- The OWNER will not be responsible for late mail delivery of bids and no bid may be withdrawn or modified in any way after the deadline for bid opening. No bid amounts shall be shown on the outside of the bid envelope.
13. Modification and Withdrawal of Bids:
- 13.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.
14. Opening of Bids: Bids will be opened, and read aloud.
15. Bids to Remain Subject to Acceptance: All bids will remain subject to acceptance for sixty (60) days after the day of the Bid opening, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to that date.
16. Award of Contract:
- 16.1 OWNER reserves the right to reject any and all Bids, to waive any and all formalities not involving price, time or changes in the WORK and to negotiate contract terms with the Successful Bidder, and the right to disregard all nonconforming, non-responsive, unbalanced or conditional Bids. OWNER reserves the right to reject the Bid of any Bidder at the OWNER's sole discretion. OWNER also reserves the right to resolve any discrepancies in the multiplication of units of WORK and unit prices or between the indicated sum of any column of figures and the correct sum at the OWNER's sole discretion.
- 16.2 In evaluating Bids, OWNER will consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Proposal or prior to the Notice of Award.

- 16.3 OWNER may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the WORK as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. OWNER also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the WORK when such data is required to be submitted prior to the Notice of Award.
- 16.4 OWNER may conduct such investigations as OWNER deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the WORK in accordance with the Contract Documents to OWNER's satisfaction within the prescribed time.
- 16.5 If the contract is to be awarded, OWNER will give the Successful Bidder a Notice of Award within sixty days after the day of the Bid opening.
17. Contract Security: Performance and Payment Bonds shall be submitted as specified in the Advertisement for Bids. Only Barrow County Performance and Payment Bond Forms will be accepted.
18. Signing of Agreement: All bidders are required to execute the Construction Agreement included in this bid package to indicate the bidder's willingness to comply with all terms of the Agreement and to submit the executed Agreement with the bid. Upon award of the Project to the winning bidder, the County will execute the Agreement. There will be no re-negotiation of terms of the Agreement. Please be advised that the bidder's execution of the Agreement prior to the award of the Project does not constitute the acceptance of an offer by the County or otherwise bind the County in any way until such time as the County executes the Agreement.
19. Laws and Regulations: The CONTRACTOR shall keep itself fully informed of all laws, ordinances and regulations of State, City and County 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 this contract, or in the drawings or specifications herein referred to, in relation to any such law, ordinance, regulation, order or decree, CONTRACTOR shall forthwith report the same in writing to the OWNER. 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 and its agents against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree whether by CONTRACTOR or by its employees.
20. Non-Segregated Facilities: Bidders must certify that they do not and will not, maintain or provide for their employees any facilities that are segregated on a basis of race, color, creed or national origin.

21. OWNER's Options To Purchase Materials:

- 21.1 By submitting a Bid, a Bidder agrees to allow the OWNER to purchase certain materials for this Project at the price quoted to Bidder by its supplier. The Bidder further agrees to execute a change order at the time of execution of the Contract Agreement to adjust the appropriate unit prices or extended totals and total contract amount. The amount of the change order will be based on deducting from the prices bid the sum of:
- 21.1.1 The cost of the materials;
 - 21.1.2 Shipping costs, based on freight-on board (FOB) job site; and
 - 21.1.3 Sales tax in the amount of seven percent of the sum of the two preceding items.
- 21.2 By virtue of a Bidder utilizing quotes from suppliers in the preparation of its bid for this Project, the Bidder declares that it has reached an agreement with its potential suppliers to allow the OWNER to purchase the materials for this Project from the suppliers in accordance with the terms and conditions included herein.
- 21.3 The apparent Low Bidder supplier of the designated material shall each submit a sworn affidavit stating the cost of the material and the cost of shipping the material which was utilized in the Bidder's preparation of its bid.
- 21.4 In the event the OWNER furnishes materials for this Project:
- 21.4.1 The CONTRACTOR shall be responsible for scheduling shop drawings, the delivery of the materials to the Project site, as well as establishing the hours of delivery and method of delivery to the Project site. The CONTRACTOR shall maintain communication with the material schedules. The CONTRACTOR shall submit, with construction progress schedule, a schedule for required deliveries of OWNER furnished material.
 - 21.4.2 No additional payment shall be made to CONTRACTOR on account of delays in delivery of materials furnished by the OWNER.
 - 21.4.3 The CONTRACTOR shall pay all delivery waiting charges.
 - 21.4.4 The CONTRACTOR shall review and handle all shop drawings prepared by the supplier in accordance with Section IX of these Specifications.
 - 21.4.5 Upon delivery of materials, the CONTRACTOR shall proceed without delay to unload such materials.
 - 21.4.6 Should any material be damaged, lost, or fail under test, and in the opinion of the ENGINEER, such failure or damage is the result of improper handling, it shall be replaced in kind by the CONTRACTOR at no cost to the OWNER.
 - 21.4.7 No additional payment will be made for receiving, handling and distributing materials furnished by the OWNER.

- 21.4.8 Fittings, solid sleeves and special pipe, which are not shown on the Drawings and which are installed for the convenience of the CONTRACTOR, shall not be paid for the OWNER.
- 21.4.9 Upon receipt of materials from the manufacturer, the CONTRACTOR shall make an inspection of such materials, checking and certifying the bill of lading, noting any discrepancies and obtaining a proper memorandum signed by the agent of the carrier for any shortage in the shipment, or for any damaged materials received. All bills of lading and any memorandum for shortage of damage of material in the shipment shall be promptly submitted to the ENGINEER. The CONTRACTOR shall be responsible for distribution of all materials as required to complete the WORK. Materials furnished to the CONTRACTOR shall be in the custody of the CONTRACTOR from the time of receipt by the CONTRACTOR of such materials from the carrier until final acceptance of the completed WORK. The CONTRACTOR shall be responsible for any loss or damage to materials furnished by the OWNER.

END OF SECTION

SECTION III PROPOSAL

To: Randall Dowling, County Manager
Barrow County Board of Commissioners
30 North Broad Street
Winder, Georgia, 30680

PROJECT TITLE: Tanners Bridge Road LAS Mechanical Screening Facilities (SS016)

Bidder's person to contact for additional information on this Bid Form:

Name:

Address:

Telephone:

Licensed, Class:

Contractor No.

1. BIDDER'S DECLARATION AND UNDERSTANDING

- 1.1 The undersigned, hereinafter called the Bidder, declares that the only persons or parties interested in this Bid are those named herein, that this Bid is, in all respects, fair and without fraud, that it is made without collusion with any official of the OWNER, and that the Bid is made without any connection or collusion with any person submitting another Bid on this Project.
- 1.2 The Bidder further declares that he has carefully examined the Bidding and Contract Documents for the construction of the project, that he has personally inspected the site, that he has satisfied himself as to the quantities involved, including materials and equipment, and conditions of work involved, including the fact that the description of the quantities of work and materials, as included herein, is brief and is intended only to indicate the general nature of the work and to identify the said quantities with the detailed requirements of the Bidding and Bidding and Contract Documents, and that this Bid Form is made according to the provisions and under the terms of the Bidding Documents, which Documents are hereby made a part of this Bid Form.

- 1.3 The Bidder further acknowledges that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing access to the site; rights-of-way and temporary construction limits; disposal, handling and storage of materials; availability of labor, water, electric power, and roads; and uncertainties of weather, creek stages, or similar physical conditions at the site; the conformation and conditions of the ground; the character of equipment and facilities needed preliminary to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof covered by the Bidding and Contract Documents.
- 1.4 The Bidder further acknowledges that he has satisfied himself/herself as to the character, quality, and quantity of surface and subsurface materials to be encountered from his inspection of the site and from reviewing any available records or exploratory work furnished by the OWNER or included in these Documents. Failure by the CONTRACTOR to acquaint himself with the physical conditions of the site and all available information will not relieve him from responsibility for properly estimating the difficulty or cost of successfully performing the work.
- 1.5 The Bidder warrants that as a result of his examination and investigation of all the aforesaid data that he can perform the work in a good and workmanlike manner and to the satisfaction of the OWNER. The OWNER assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of the Agreement, unless (1) such representations are expressly stated in the Agreement Form, and (2) the Agreement Form expressly provides that the responsibility therefor is assumed by the OWNER.
- 1.6 Bidder shall include the following additional documents and information with this Bid Form:
 - 1.6.1 Bid Security
 - 1.6.2 Bidder's Certification of License Number on the outside of envelope containing this Bid Form.

2. CONTRACT EXECUTION AND BONDS

- 2.1 The Contractor grants to the OWNER the exclusive right and option to accept its bid, upon the terms and conditions provided for in the Bidding Documents. The Contractor shall be obligated to hold its bid open for sixty (60) days from the date of the submittal of its bid. The OWNER may exercise its right to accept the bid at any time during this sixty (60) day period.

- 2.2 All bidders are required to execute the Construction Agreement included in this bid package to indicate the bidder's willingness to comply with all terms of the Agreement and to submit the executed Agreement with the bid. Upon award of the Project to the winning bidder, the County will execute the Agreement. There will be no re-negotiation of terms of the Agreement. Please be advised that the bidder's execution of the Agreement prior to the award of the Project does not constitute the acceptance of an offer by the County or otherwise bind the County in any way until such time as the County executes the Agreement.

The Bidder will, within 5 days from receiving Notice of Award, deliver to the OWNER the Performance Bond, Payment Bond, and Certificate(s) of Insurance, required herein, and will, to the extent of his bid, furnish all machinery, tools, apparatus, and other means of construction and do the work and furnish all the materials necessary to complete all work as specified or indicated in the Bidding and Contract Documents.

3. CERTIFICATES OF INSURANCE

- 3.1 The Successful Bidder agrees to furnish the OWNER, within 5 days from receiving Notice of Award, both the Certificate of Insurance required herein and the insurance company's own Certificate of Insurance.
- 3.2 The Successful Bidder further agrees that the total bid amount stated herein includes specific consideration for the insurance coverages, including contractual liability, specified in the Bidding and Contract Documents.

4. START OF CONSTRUCTION AND CONTRACT COMPLETION TIME

- 4.1 The Successful Bidder further agrees to promptly mobilize and begin work within 15 days from the Contract start date specified in the OWNER'S Notice to Proceed, and to be substantially complete, as defined in the General Conditions, within **100** days from the Contract start date specified in the OWNER'S Notice to Proceed. All work tasks of the total project shall be complete in all respects within **100** days from the date specified in the OWNER'S Notice to Proceed.

5. ADDENDA

- 5.1 The Bidder hereby acknowledges that he has received Addenda No's , , , , , (Bidder shall insert No. of each Addendum received) and agrees that all addenda issued are hereby made part of the Bidding and Contract Documents, and the Bidder further agrees that his Bid Form includes all impacts resulting from said addenda.

6. SALES AND USE TAXES

- 6.1 The Bidder agrees that all sales and use taxes, if applicable, are included in the stated bid prices for the work.

7. BASIS OF AWARD

7.1 Award of Contract will be made in accordance with Paragraph 16 (Award of Contract) of the INSTRUCTIONS TO BIDDERS.

8. TOTAL BID AMOUNT

8.1 The Bidder further proposes to accept as full payment for the work proposed herein the amounts computed under the provisions of the Bidding and Contract Documents and based on the following unit price amounts, it being expressly understood that the unit prices are independent of the exact quantities involved for each. The Bidder agrees that the unit prices represent a true measure of all labor and materials required to perform the work, including all allowances for overhead, profit, bond cost and any and all other costs associated with the work for each type and unit of work called for in these Bidding and Contract Documents. The unit price amounts shall be shown in both words and figures. In case of a discrepancy, the amounts shown in words shall govern.

8.2 BASE BID

8.2.1 LUMP SUM

Bid Item No.	<u>Bid Item</u> _____	<u>Qty</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Extended Total Amount</u>
1	Mobilization	1	LS	\$ _____/LS_____	\$ _____ Dollars
2	Mechanical Screening Facilities	1	LS	\$ _____/LS_____	\$ _____ Dollars

NOTE: All labor, material and equipment required to complete the work as shown on the plans but not specifically itemized in the above bid items but shown or called out on the plans shall be included in the price.

TOTAL OF EXTENDED AMOUNT FOR LUMP SUM PRICES LISTED ABOVE:

_____ Dollars

and _____ cents \$ _____

(Amount written in words has precedence)

8.2.2 Bidder acknowledges that the lump sum prices have been computed in accordance with the General Conditions.

8.2.3 Total Base Bid Summary:

8.2.3.1 Lump Sum Extended Total: \$ _____

8.2.3.2 TOTAL BID AMOUNT: \$ _____
(including bond premium)

8.3 MANDATORY BID ALTERNATE "A"

8.3.1 LUMP SUM

Bid Item No.	<u>Bid Item</u> _____	<u>Qty</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Extended Total Amount</u>
1	Flow Metering Installation	1	LS	\$ _____/LS _____	
				\$ _____	Dollars

NOTE: All labor, material and equipment required to complete the work as shown on the plans but not specifically itemized in the above bid items but shown or called out on the plans shall be included in the price.

TOTAL OF EXTENDED AMOUNT FOR MANDATORY BID ALTERNATE "A" LUMP SUM PRICE LISTED ABOVE:

_____ Dollars

and _____ cents \$ _____

(Amount written in words has precedence)

8.3.2 Bidder acknowledges that the lump sum prices have been computed in accordance with the General Conditions.

8.3.3 Total Mandatory Bid Alternate "A" Summary:

8.3.3.1 Lump Sum Extended Total: \$ _____

8.3.3.2 TOTAL BID AMOUNT: \$ _____
(including bond premium)

9. EXPERIENCE OF BIDDER

13.1 The Bidder submits the following list of at least five clients for whom projects involving similar construction have been performed within the past 10 years.

- 1) Name of Client (Owner and Contact) _____
Telephone Number _____
Street _____
City _____ State _____ Zip _____
Project Name _____
Date _____

- 2) Name of Client (Owner and Contact) _____
Telephone Number _____
Street _____
City _____ State _____ Zip _____
Project Name _____
Date _____

- 3) Name of Client (Owner and Contact) _____
Telephone Number _____
Street _____
City _____ State _____ Zip _____
Project Name _____
Date _____

4) Name of Client (Owner and Contact) _____
Telephone Number _____
Street _____
City _____ State _____ Zip _____
Project Name _____
Date _____

5) Name of Client (Owner and Contact) _____
Telephone Number _____
Street _____
City _____ State _____ Zip _____
Project Name _____
Date _____

10. PERFORMANCE OF WORK BY CONTRACTOR

10.1 The Bidder shall perform at least 50 percent of the work with his own forces.

11. SUBCONTRACTORS

11.1 The Bidder further proposes that the following subcontracting firms or businesses will be awarded subcontracts for the following portions of the work in the event that the Bidder is awarded the Contract:

Name _____
Type of Work _____
Street _____
City _____ State _____ Zip _____

Name _____

Type of Work _____

Street _____

City _____ State _____ Zip _____

Name _____

Type of Work _____

Street _____

City _____ State _____ Zip _____

12. SURETY

12.1 If the Bidder is awarded a construction Contract, the Surety who provides the Performance Bond and Payment Bond will be:

_____ whose address is

Street _____

City _____ State _____ Zip _____

13. BIDDER

13.1 The name of the Bidder submitting this Bid Form is

_____ doing business at

Street _____

City _____ State _____ Zip _____

which is the address to which all communications concerned with this Bid Form and with the Agreement Form shall be sent.

13.2 The names of the principal officers of the corporation submitting this Bid Form, or of the partnership, or of all persons interested in this Bid Form as principals are as follows:

If Sole Proprietor or Partnership

IN WITNESS hereto the undersigned has set his (its) hand this ____ day of _____ 2015.

Signature of Bidder

Title

If Corporation

IN WITNESS WHEREOF the undersigned corporation has caused this instrument to be executed and its seal affixed by its duly authorized officers this _____ day of _____ 2015.

(SEAL)

Name of Corporation

By

Title

Attest

Secretary

End of Section

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

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

3. This obligation shall be null and void if:

3.1 The County accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension of that time agreed to in writing by the County) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents; or

3.2 All Bids are rejected by the County; or

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

4. Payment under this Bond will be due and payable upon Default by Bidder within 30 calendar days after receipt by Bidder and Surety of a written Notice of Default from the County, which Notice will be given with reasonable promptness and will identify this Bond and the Project and include a statement of the amount due.

5. Surety waives notice of, as well as any and all defenses based on or arising out of, any time extension to issue a Notice of Award agreed to in writing by the County and Bidder, provided that the total time, including extensions, for issuing a

Notice of Award shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.

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

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the State of Georgia.

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

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

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

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

12. The terms of this Bid Bond shall be governed by the laws of the State of Georgia.

Section V
AGREEMENT FOR CONSTRUCTION SERVICES

This is the Standard Construction Services Agreement of Barrow County. Any Contractor doing business with the County must enter into this Agreement.

CONSTRUCTION SERVICES AGREEMENT

This Construction Services Agreement (the "Agreement") is made and entered into this ____ day of _____, 2015, by and between BARROW COUNTY, a political subdivision of the State of Georgia, acting by and through its governing authority, the Barrow County Board of Commissioners ("County"), and _____, a _____, ("Contractor"), collectively referred to as the "Parties".

WITNESSETH:

WHEREAS, the County desires to employ a contractor to perform services for the construction of a Project, as defined below; and

WHEREAS, the County solicited bids for construction of the Project pursuant to Barrow County Request for Bid 2015-6, Project Number SS016, dated December 17, 2014 (the "RFB," a copy of which is maintained in the files of the Barrow County Purchasing Department); and

WHEREAS, in response to the RFB, the Contractor submitted a complete and timely bid (the "Bid Documents") and met all bid requirements such that the County awarded Project Number SS016 to the Contractor; and

WHEREAS, the County finds that specialized knowledge, skills, and training are necessary to perform the Work contemplated under this Agreement; and

WHEREAS, the Contractor has represented that it is qualified by training and experience to perform the Work; and

WHEREAS, based upon Contractor's bid to _____, the County has selected Contractor as the successful bidder, and

WHEREAS, Contractor desires to perform the Work as set forth in this Agreement under the terms and conditions provided in this Agreement; and

WHEREAS, the public interest will be served by this Agreement; and

WHEREAS, Contractor has familiarized itself with the nature and extent of the Contract Documents, the Project, and the Work, with all local conditions and federal, state and local laws, ordinances, rules and regulations in any manner that may affect cost, progress or performance of Work, and Contractor is aware that he must be licensed to do business in the State of Georgia.

NOW THEREFORE, for and in consideration of the mutual promises contained herein and other good and adequate consideration, the sufficiency of which is hereby acknowledged, the Parties hereto do mutually agree as follows:

Section 1. Contract Documents

The following documents are incorporated herein by reference and constitute the Contract Documents:

- A. This Agreement;
- B. The RFB (maintained on file with the Purchasing Department);
- C. The Bid Documents from Contractor, dated _____, _____, with portions attached hereto as Exhibit "A";
- D. Performance Bond and Payment Bond (included in the RFB maintained on file with the Purchasing Department);
- E. Noncollusion Affidavit of Prime Bidder (if issued), attached hereto as Exhibit "B";
- F. Final Affidavit, attached hereto as Exhibit "C";
- G. Alien Employment affidavits attached hereto as Exhibits "D" and "E";
- H. Plans and specifications (included in the RFB maintained on file with the Purchasing Department), with any modifications (if issued) attached hereto as Exhibit "F";
- I. Key Personnel, attached hereto as Exhibit "G";
- J. Contract Administration provisions (if issued), attached hereto as Exhibit "H";
- K. General Conditions (if issued), attached hereto as Exhibit "I";
- L. Supplementary Conditions (if issued), attached hereto as Exhibit "J";
- M. Notice of Award, attached hereto as Exhibit "K";
- N. Barrow County Code of Ethics;
- O. The following, which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents if properly adopted in writing and executed by the Parties.

Section 2. Project Description; Engineer

- A. Project. The Project is defined generally as follows:
Tanners Bridge Road LAS Mechanical Screening Facilities (the "Project")

- B. Engineer. The Project has been designed by **Precision Planning, Inc.** (hereinafter referred to as the "Engineer"). The Engineer is to act as the County's representative with respect to the Project, and shall assume all duties and responsibilities and have the rights and authority assigned to the Engineer in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

Section 3. The Work

The Work to be completed under this Agreement (the "Work") includes, but shall not be limited to, **constructing a head works structure including a mechanical screen and additional piping and appurtenances for the County's Tanner Bridge Road Land Application System; and alternate Work including construction of an influent flow meter vault, influent manhole, piping and appurtenances.** The Work includes all material, labor, insurance, tools, equipment, and any other miscellaneous items and work reasonably inferable from the Contract Documents. The term "reasonably inferable" takes into consideration the understanding of the Parties that some details necessary for completion of the Work may not be shown on the drawings or included in the specifications, but they are a requirement of the Work if they are a usual and customary component of the Work or are otherwise necessary for complete installation and operation of the Work. Contractor shall complete the Work in strict accordance with the Contract Documents. In the event of any discrepancy among the terms of the various Contract Documents, the provision most beneficial to the County, as determined by the County in its sole discretion, shall govern.

The County will issue a Notice to Proceed, which Notice to Proceed shall state the dates for beginning Work and for achieving Final Completion of Work. Work shall commence within five (5) days of County's issuance of the Notice to Proceed.

Unless otherwise approved, the Contractor shall perform its obligations under this Agreement as expeditiously as is consistent with reasonable skill and care and the orderly progress of the Work.

Section 4. Contract Periods; Liquidated Damages

- A. Contract Periods/Contract Term. Contractor warrants and represents that it will perform its Work in a prompt and timely manner, which shall not impose delays on the progress of the Work. The Contractor shall commence Work pursuant to this Agreement on or before a date to be specified on a written "Notice to Proceed" provided by the County (the "Commencement Date"), and the Parties intend that all Work shall be completed on or before _____, 20____. Every effort will be made by Contractor to shorten this period. If the Term of this Agreement is longer than one year, the Parties agree that this Agreement, as required by O.C.G.A. § 36-60-13, shall terminate absolutely and without further obligation on the part of the County at the end of the County's fiscal year each year of the Term, and further, that this Agreement shall automatically renew

on the first day of each subsequent County fiscal year of the Term absent the County's provision of written notice of non-renewal to Contractor at least five (5) days prior to the end of the then current calendar or fiscal year, as applicable. Title to any supplies, materials, equipment, or other personal property shall remain in Contractor until fully paid for by the County.

- B. Liquidated Damages. The County and Contractor recognize that time is of the essence of this Agreement and that County will suffer financial loss if the Work is not completed in accordance with the deadlines specified in Section 4(A) above and within the Contract Documents. The County and Contractor also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the County if the Work is not completed within the specified times. Accordingly, instead of requiring any such proof, the County and Contractor agree that, as liquidated damages for delay (but not as a penalty), the Contractor shall pay to the County **Two Hundred Fifty and 00/100 Dollars (\$250.00)** for each and every day that expires after the deadlines provided herein, or agreed to in writing by both Parties in a change order.
- C. Expediting Completion. The Contractor is accountable for completing the Work within the time period provided in the Contract Documents, or as otherwise amended by a change order. If, in the judgment of the County, the Work is behind schedule and the rate of placement of work is inadequate to regain scheduled progress to insure timely completion of the entire Work or a separable portion thereof, the Contractor, when so informed by the County, shall immediately take action to increase the rate of work placement by:
- (1) An increase in working forces;
 - (2) An increase in equipment or tools;
 - (3) An increase in hours of work or number of shifts;
 - (4) Expediting delivery of materials; and/or
 - (5) Other action proposed if acceptable to County.

Within five (5) calendar days after such notice from County that the Work is behind schedule, the Contractor shall notify the County in writing of the specific measures taken and/or planned to increase the rate of progress. The Contractor shall include an estimate as to the date of scheduled progress recovery. Should the County deem the plan of action inadequate, the Contractor shall take additional steps to make adjustments as necessary to its plan of action until it meets with the County's approval.

Section 5. Contractor's Compensation; Time and Method of Payment

- A. The total amount paid under this Agreement as compensation for Work performed and reimbursement for costs incurred shall not, in any case, exceed \$_____, except as outlined in Section 6 below (the "Contract Price"). The compensation for Work performed shall be based upon _____ [specify hourly rate, flat fee, or other basis].
- B. County agrees to pay the Contractor for the Work performed and costs incurred by

Contractor upon certification by _____ (contract administrator) and the County that the Work was actually performed and costs actually incurred in accordance with this Agreement. Compensation for Work performed and reimbursement for costs incurred shall be paid to the Contractor upon receipt and approval by the County of invoices setting forth in detail the Work performed and costs incurred. Invoices shall be submitted on a monthly basis, and such invoices shall reflect charges incurred versus charges budgeted. Each invoice shall be accompanied by an Interim Waiver and Release upon Payment (or a Waiver and Release upon Final Payment in the case of the invoice for final payment) procured by the Contractor from all subcontractors in accordance with O.C.G.A. § 44-14-366.

- C. County and Contractor shall comply with the provisions of O.C.G.A. § 13-10-80. The Contractor through each invoice may request payment of no more than ninety percent (90%) of that portion of the Work completed during the term covered by such invoice until fifty percent (50%) of the Contract Price, as may be adjusted, is due and the manner of completion of the Work and its progress are reasonably satisfactory to the County. Payment for the remaining ten percent (10%) of Work completed and covered by such invoices shall be retained by the County until Final Completion. Once fifty percent (50%) of the Contract Price, as may be adjusted, is due and the manner of completion of the Work and its progress are reasonably satisfactory to the County, no additional retainage shall be withheld, except as provided below. At the discretion of the County and with the written approval of the Contractor, the retainage of each subcontractor may be released separately as the subcontractor completes his or her work.

If, after discontinuing the retention, the County determines that the Work is unsatisfactory or has fallen behind schedule, retention may be resumed at the previous level. If retention is resumed by the County, the Contractor and subcontractors shall be entitled to resume withholding retainage accordingly. At Final Completion of the Work and as the County determines the Work to be reasonably satisfactory, the County shall, within 30 days after the invoice and other appropriate documentation as may be required by the Contract Documents are provided to the County, pay the retainage to the Contractor. If at that time there are any remaining incomplete minor items, an amount equal to 200 percent of the value of each item as determined by the County shall be withheld until such item or items are completed. The reduced retainage shall be shared by the Contractor and subcontractors as their interests may appear.

The Contractor shall, within ten (10) days from its receipt of retainage from the County, pass through payments to subcontractors and shall reduce each subcontractor's retainage in the same manner as the Contractor's retainage is reduced by the County; provided, however, that the value of each subcontractor's work complete and in place equals fifty percent (50%) of his or her subcontract value, including approved change orders and other additions to the subcontract value, provided, further, that the work of the subcontractor is proceeding satisfactorily and the subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his or her work including any warranty work as the Contractor in his or her reasonable discretion may require, including, but not limited to, a payment and performance bond. The subcontractor shall, within ten (10) days from the

subcontractor's receipt of retainage from the Contractor, pass through payments to lower tier subcontractors and shall reduce each lower tier subcontractor's retainage in the same manner as the subcontractor's retainage is reduced by the Contractor; provided, however, that the value of each lower tier subcontractor's work complete and in place equals fifty percent (50%) of his or her subcontract value, including approved change orders and other additions to the subcontract value; provided, further, that the work of the lower tier subcontractor is proceeding satisfactorily and the lower tier subcontractor has provided or provides such satisfactory reasonable assurances of continued performance and financial responsibility to complete his or her work including any warranty work as the subcontractor in his or her reasonable discretion may require, including, but not limited to, a payment and performance bond.

Neither final payment nor any retained percentage shall become due until the Contractor submits to the County: (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the County or County property might be responsible or encumbered (less amounts withheld by County) have been paid or otherwise satisfied; (2) a certificate evidencing that insurance, required by the Contract Documents to remain in force after final payment, is currently in effect and will not be canceled or allowed to expire until at least 30 calendar days prior written notice has been given to the County; (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents; (4) consent of surety, if any, to final payment; (5) a release or waiver of liens, claims, security interests, and encumbrances by all subcontractors and material suppliers; and (6), if required by the County, other data establishing payment or satisfaction of obligations, such as receipts, to the extent and in such form as may be designated by the County. If a subcontractor or material supplier refuses to furnish a release or waiver as required by the County, the Contractor may furnish a bond satisfactory to the County to indemnify the County against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the County all money that the County may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

Acceptance of final payment by the Contractor, a subcontractor or material supplier shall constitute a waiver of claims by that payee, except those claims previously made in writing and identified by that payee as unsettled at the time of final application for payment.

- D. Any material deviations in tests or inspections performed, or times or locations required to complete such tests or inspections, and like deviations from the Work described in this Agreement shall be clearly communicated to the County *before charges are incurred* and shall be handled through change orders, as described in Section 6 below. The County shall pay the Contractor within thirty (30) days after approval of the invoice by County staff, less any retainage as described in this Section. No payments will be made for unauthorized work. Payment will be sent to the designated address by U. S. Mail only; payment will not be hand-delivered, though the Contractor may arrange to pick up payments directly from the County or may make written requests for the County to deliver payments to the Contractor by Federal Express delivery at the Contractor's

expense.

Section 6. Change Orders

- A. "Change order" means a written modification of the Contract Documents, signed by the County and the Contractor.
- B. The County reserves the right to order changes in the Work to be performed under this Agreement by altering, adding to, or deducting from the Work. All such changes shall be incorporated in written change orders and executed by the Contractor and the County. Such change orders shall specify the changes ordered and any necessary adjustment of compensation and completion time. If the Parties cannot reach an agreement on the terms for performing the changed work within a reasonable time to avoid delay or other unfavorable impacts as determined by the County in its sole discretion, the County shall have the right to determine reasonable terms, and the Contractor shall proceed with the changed work.
- C. Any work added to the scope of this Agreement by a change order shall be executed under all the applicable conditions of this Agreement. No claim for additional compensation or extension of time shall be recognized, unless contained in a written change order duly executed on behalf of the County and the Contractor.
- D. The County Manager has authority to execute without further action of the Barrow County Board of Commissioners, any number of change orders so long as their total effect does not materially alter the terms of this Agreement or materially increase the total amount to be paid under this Agreement, as set forth in Section 5 above. Any such change orders materially altering the terms of this Agreement, or increasing the total amount to be paid under this Agreement in excess of \$25,000.00, must be approved by the resolution of the Barrow County Board of Commissioners.

Section 7. Covenants of Contractor.

A. Ethics Code

Contractor agrees that it shall not engage in any activity or conduct that would result in a violation of the Barrow County Code of Ethics or any other similar law or regulation.

B. Time is of the Essence

Contractor specifically acknowledges that TIME IS OF THE ESSENCE for completion of the Project.

C. Expertise of Contractor

Contractor accepts the relationship of trust and confidence established between it and the County, recognizing that the County's intention and purpose in entering into this Agreement is to engage an entity with the requisite capacity, experience, and professional

skill and judgment to provide the Work in pursuit of the timely and competent completion of the Work undertaken by Contractor under this Agreement. The Contractor agrees to use its best efforts, skill, judgment, and abilities to perform its obligations and to further the interests of County and the Project in accordance with County's requirements and procedures.

Contractor represents that it has familiarized itself with the nature and extent of the Contract Documents, the Work, work site(s), locality, and all local conditions, laws and regulations that in any manner may affect cost, progress, performance, or furnishing of the Work. Contractor further represents and agrees that it has correlated the results of all such observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents. Contractor represents that it has given the County written notice of all conflicts, errors, or discrepancies that the Contractor has discovered in the Contract Documents, and the written resolution thereof by the County is acceptable to the Contractor.

Contractor agrees that it will perform its services in accordance with the usual and customary standards of the Contractor's profession or business and in compliance with all applicable federal, state, and local laws, regulations, codes, ordinances, or orders applicable to the Project. Further, the Contractor agrees to bear the full cost of correcting the Contractor's negligent or improper Work, the negligent or improper work of its contractors and subcontractors, and any harm caused by such negligent Work.

The Contractor's duties shall not be diminished by any approval by the County of Work completed or produced; nor shall the Contractor be released from any liability by any approval by the County of Work completed or produced, it being understood that the County is ultimately relying upon the Contractor's skill and knowledge in performing the Work required under the Contract Documents.

In the event that during the course of performing the Work, the Contractor discovers or reasonably should discover that there exists in any drawings, specifications, plans, sketches, instructions, information, requirements, procedures, and other data supplied to the Contractor (by the County or any other party) that is, in the Contractor's opinion, unsuitable, improper, or inaccurate for the purposes for which the document or data is furnished, Contractor shall promptly inform the County of such inaccuracies, impropriety, issues or concerns.

D. Budgetary Limitations

Contractor agrees and acknowledges that budgetary limitations are not a justification for breach of sound principals of Contractor's profession and industry. Contractor shall take no calculated risk in the performance of the Work. Specifically, Contractor agrees that, in the event it cannot perform the Work within the budgetary limitations established without disregarding sound principals of Contractor's profession and industry, Contractor will give written notice immediately to the County.

E. County's Reliance on the Work

The Contractor acknowledges and agrees that the County does not undertake to approve or pass upon matters of expertise of the Contractor and that therefore, the County bears no responsibility for Contractor's Work performed under this Agreement. The Contractor acknowledges and agrees that the acceptance of Work by the County is limited to the function of determining whether there has been compliance with what is required to be produced under this Agreement. The County will not, and need not, inquire into adequacy, fitness, suitability or correctness of Contractor's performance. Contractor further agrees that no approval of designs, plans, or specifications by any person, body, or agency shall relieve Contractor of the responsibility for adequacy, fitness, suitability, and correctness of Contractor's Work under professional and industry standards, or for performing services under this Agreement in accordance with sound and accepted professional and industry principals.

F. Contractor's Reliance on Submissions by the County

Contractor must have timely information and input from the County in order to perform the Work required under this Agreement. Contractor is entitled to rely upon information provided by the County, but Contractor shall be required to provide immediate written notice to the County if Contractor knows or reasonably should know that any information provided by the County is erroneous, inconsistent, or otherwise problematic.

G. Contractor's Representative

_____ shall be authorized to act on Contractor's behalf with respect to the Work as Contractor's designated representative.

H. Assignment of Agreement

The Contractor covenants and agrees not to assign or transfer any interest in, nor delegate any duties of this Agreement, without the prior express written consent of the County. As to any approved subcontractors, the Contractor shall be solely responsible for reimbursing them, and the County shall have no obligation to them.

I. Responsibility of Contractor and Indemnification of County

The Contractor covenants and agrees to take and assume all responsibility for the Work rendered in connection with this Agreement. The Contractor shall bear all losses and damages directly or indirectly resulting to it and/or the County on account of the performance or character of the Work rendered pursuant to this Agreement. Contractor shall defend, indemnify, and hold harmless the County, its officers, boards, commissions, elected and appointed officials, employees, servants, volunteers and agents (hereinafter referred to as "County Parties") from and against any and all claims, injuries, suits, actions, judgments, damages, losses, costs, expenses, and liability of any kind whatsoever, including but not limited to, attorney's fees and costs of defense (hereinafter "Liabilities"), which may be the result of willful, negligent, or tortious conduct arising out

of the Work, performance of contracted services, or operations by the Contractor, any subcontractor, anyone directly or indirectly employed by the Contractor or subcontractor, or anyone for whose acts the Contractor or subcontractor may be liable, regardless of whether or not the negligent act is caused in part by a party indemnified hereunder. This indemnity obligation does not include Liabilities caused by or resulting from the sole negligence of the County or County Parties. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this provision.

In any and all claims against the County or County Parties, by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by the Contractor or subcontractor, or anyone for whose acts the Contractor or subcontractor may be liable, the indemnification obligation set forth in this provision shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any subcontractor under workers' or workmen's compensation acts, disability benefit acts, or other employee benefit acts. This obligation to indemnify, defend, and hold harmless the County and County Parties shall survive expiration or termination of this Agreement, provided that the claims are based upon or arise out of actions that occurred during the performance of this Agreement.

J. Independent Contractor

Contractor hereby covenants and declares that it is engaged in an independent business and agrees to perform the Work as an independent contractor and not as the agent or employee of the County. The Contractor agrees to be solely responsible for its own matters relating to the time and place the services are performed; the instrumentalities, tools, supplies, and/or materials necessary to complete the Work; hiring of subcontractors, agents, or employees to complete the Work; and the payment of employees, including compliance with Social Security, withholding, and all other regulations governing such matters. The Contractor agrees to be solely responsible for its own acts and those of its subordinates, employees, and subcontractors during the life of this Agreement. Any provisions of this Agreement that may appear to give the County the right to direct Contractor as to the details of the services to be performed by Contractor or to exercise a measure of control over such services will be deemed to mean that Contractor shall follow the directions of the County with regard to the results of such services only.

Inasmuch as the County and the Contractor are independent of each other, neither has the authority to bind the other to any third person or otherwise to act in any way as the representative of the other, unless otherwise expressly agreed to in writing signed by both parties hereto. The Contractor agrees not to represent itself as the County's agent for any purpose to any party or to allow any employee of the Contractor to do so, unless specifically authorized, in advance and in writing, to do so, and then only for the limited purpose stated in such authorization. The Contractor shall assume full liability for any contracts or agreements the Contractor enters into on behalf of the County without the express knowledge and prior written consent of the County.

K. Insurance

- (1) Requirements: The Contractor shall have and maintain in full force and effect for the duration of this Agreement, insurance insuring against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work by the Contractor, its agents, representatives, employees or subcontractors. All policies shall be subject to approval by the County Attorney to form and content. These requirements are subject to amendment or waiver if so approved in writing by the County Manager.
- (2) Minimum Limits of Insurance: Contractor shall maintain the following insurance policies with limits no less than:
 - (a) Comprehensive General Liability policy of \$1,000,000 (one million dollars) combined single limit per occurrence \$2,000,000 (two million dollars) aggregate for bodily and personal injury, sickness, disease or death, injury to or destruction of property, including loss of use resulting therefrom.
 - (b) Comprehensive Automobile Liability policy (covering owned, non-owned, and hired automobiles) of \$1,000,000 (one million dollars) combined single limit per occurrence \$2,000,000 (two million dollars) aggregate for bodily and personal injury, sickness, disease or death, injury to or destruction of property, including loss of use resulting therefrom.
 - (c) Professional Liability policy of \$1,000,000 (one million dollars) for claims arising out of professional services and caused by the Contractor's errors, omissions, or negligent acts.
 - (d) Workers' Compensation policy with limits as required by the State of Georgia and Employers Liability limits of \$1,000,000 (one million dollars) per accident.
- (3) Deductibles and Self-Insured Retentions: Any deductibles or self-insured retentions must be declared to and approved by the County in writing.
- (4) Other Insurance Provisions: The policy is to contain, or be endorsed to contain, the following provisions:
 - (a) General Liability and Automobile Liability Coverage.
 - (i) The County and County Parties are to be covered as insureds as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, leased, or used by the Contractor; automobiles owned, leased, hired, or borrowed by the Contractor. The coverage shall contain no special limitations

- on the scope of protection afforded to the County or County Parties.
- (ii) The Contractor's insurance coverage shall be primary noncontributing insurance as respects to any other insurance or self-insurance available to the County or County Parties. Any insurance or self-insurance maintained by the County or County Parties shall be in excess of the Contractor's insurance and shall not contribute with it.
 - (iii) Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the County and County Parties.
 - (iv) Coverage shall state that the Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought.
 - (v) Coverage shall be provided on a "pay on behalf" basis, with defense costs payable in addition to policy limits. There shall be no cross liability exclusion.
 - (vi) The insurer shall agree to waive all rights of subrogation against the County and County Parties for losses arising from work performed by the Contractor for the County.
- (b) Workers' Compensation Coverage: The insurer providing Workers' Compensation Coverage will agree to waive all rights of subrogation against the County and County Parties for losses arising from work performed by the Contractor for the County.
- (c) Builder's Risk Insurance. Contractor shall provide a Builder's Risk Insurance Policy to be made payable to the County and Contractor, as their interests may appear. The policy amount shall be equal to 100% of the Contract price, written on a Builder's Risk "All Risk," or its equivalent. The policy shall provide, or be endorsed to provide, as follows: "The following may occur without diminishing, changing, altering or otherwise affecting the coverage and protection afforded the insured under this policy: i) Equipment may be delivered to the insured premises and installed in place ready for use; and ii) Partial or complete occupancy by Owner; and iii) Performance of Work in connection with construction operations insured by the Owner, by agents or lessees, or other Contractors of the Owner or Using Agency."

- (d) All Coverages:
 - (i) Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the County.
 - (ii) Policies shall have concurrent starting and ending dates.
- (5) Acceptability of Insurers: Insurance is to be placed with insurers licensed to do business in Georgia and with an A.M. Best's' rating of no less than A:VII.
- (6) Verification of Coverage: Contractor shall furnish the County with certificates of insurance and endorsements to the policies evidencing coverage required by this Section prior to the start of work. The certificate of insurance and endorsements shall be on a form utilized by Contractor's insurer in its normal course of business and shall be received and approved by the County prior to execution of this Agreement by the County. The County reserves the right to require complete, certified copies of all required insurance policies, at any time. The Contractor shall provide proof that any expiring coverage has been renewed or replaced at least two (2) weeks prior to the expiration of the coverage.
- (7) Subcontractors: Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated in this Agreement, including but not limited to naming the County and County Parties as additional insureds.
- (8) Claims-Made Policies: Contractor shall extend any claims-made insurance policy for at least six (6) years after termination or final payment under the Agreement, whichever is later.
- (9) County as Additional Insured and Loss Payee: The County and County Parties shall be named as additional insureds and loss payees on all policies required by this Agreement, except the County need not be named as an additional insured and loss payee on any Professional Liability policy or Workers' Compensation policy.

L. Bonds

The Contractor shall provide Performance and Payment bonds on the County's forms and with a surety licensed to do business in Georgia and listed on the Treasury Department's most current list (Circular 570 as amended). Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

M. Employment of Unauthorized Aliens Prohibited – *E-Verify Affidavit*

It is the policy of County that unauthorized aliens shall not be employed to perform work on County contracts involving the physical performance of services. Therefore, the County shall not enter into a contract for the physical performance of services within the State of Georgia unless:

- (1) the Consultant shall provide evidence on County-provided forms, attached hereto as Exhibits “D” and “E” (affidavits regarding compliance with the E-Verify program to be sworn under oath under criminal penalty of false swearing pursuant to O.C.G.A. § 16-10-71), that it and Consultant’s subcontractors have conducted a verification, under the federal Employment Eligibility Verification (“EEV” or “E-Verify”) program, of the social security numbers, or other identifying information now or hereafter accepted by the E-Verify program, of all employees who will perform work on the County contract to ensure that no unauthorized aliens will be employed, **or**
- (2) the Consultant provides evidence that it is not required to provide an affidavit because it is licensed pursuant to Title 26 or Title 43 or by the State Bar of Georgia and is in good standing as of the date when the contract for services is to be rendered.

The Consultant hereby verifies that it has, prior to executing this Agreement, executed a notarized affidavit, the form of which is provided in Exhibit “D”, and submitted such affidavit to County or provided the County with evidence that it is not required to provide such an affidavit because it is licensed and in good standing as noted in subsection (2) above. Further, Consultant hereby agrees to comply with the requirements of the federal Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603, O.C.G.A. § 13-10-91 and Rule 300-10-1-.02.

In the event the Consultant employs or contracts with any subcontractor(s) in connection with the covered contract, the Consultant agrees to secure from such subcontractor(s) attestation of the subcontractor’s compliance with O.C.G.A. § 13-10-91 and Rule 300-10-1-.02 by the subcontractor’s execution of the subcontractor affidavit, the form of which is attached hereto as Exhibit “E”, which subcontractor affidavit shall become part of the contractor/subcontractor agreement, or evidence that the subcontractor is not required to provide such an affidavit because it is licensed and in good standing as noted in subsection (2) above. If a subcontractor affidavit is obtained, Consultant agrees to provide a completed copy to the County within five (5) business days of receipt from any subcontractor.

Where Consultant is required to provide an affidavit pursuant to O.C.G.A. § 13-10-91, the County Manager or his/her designee shall be authorized to conduct an inspection of the Consultant’s and Consultant’s subcontractors’ verification process at any time to determine that the verification was correct and complete. The Consultant and Consultant’s subcontractors shall retain all documents and records of their respective verification process for a period of three (3) years following completion of the contract. Further, where Consultant is required to provide an affidavit pursuant to O.C.G.A. § 13-

10-91, the County Manager or his/her designee shall further be authorized to conduct periodic inspections to ensure that no County Consultant or Consultant's subcontractors employ unauthorized aliens on County contracts. By entering into a contract with the County, the Consultant and Consultant's subcontractors agree to cooperate with any such investigation by making their records and personnel available upon reasonable notice for inspection and questioning. Where a Consultant or Consultant's subcontractors are found to have employed an unauthorized alien, the County Manager or his/her designee may report same to the Department of Homeland Security. The Consultant's failure to cooperate with the investigation may be sanctioned by termination of the contract, and the Consultant shall be liable for all damages and delays occasioned by the County thereby.

Consultant agrees that the employee-number category designated below is applicable to the Consultant. [Information only required if a contractor affidavit is required pursuant to O.C.G.A. § 13-10-91.]

_____ 500 or more employees.

_____ 100 or more employees.

_____ Fewer than 100 employees.

Consultant hereby agrees that, in the event Consultant employs or contracts with any subcontractor(s) in connection with this Agreement and where the subcontractor is required to provide an affidavit pursuant to O.C.G.A. § 13-10-91, the Consultant will secure from the subcontractor(s) such subcontractor(s)' indication of the above employee-number category that is applicable to the subcontractor.

The above requirements shall be in addition to the requirements of State and federal law, and shall be construed to be in conformity with those laws.

N. Records, Reports and Audits

(1) Records:

- (a) Records shall be established and maintained by the Contractor in accordance with requirements prescribed by the County with respect to all matters covered by this Agreement. Except as otherwise authorized, such records shall be maintained for a period of three years from the date that final payment is made under this Agreement. Furthermore, records that are the subject of audit findings shall be retained for three years or until such audit findings have been resolved, whichever is later.
- (b) All costs shall be supported by properly executed payrolls, time records, invoices, contracts, or vouchers, or other official documentation evidencing in proper detail the nature and propriety of the charges. All checks, payrolls, invoices, contracts, vouchers, orders, or other

accounting documents pertaining in whole or in part to this Agreement shall be clearly identified and readily accessible.

- (2) Reports and Information: Upon request, the Contractor shall furnish to the County any and all statements, records, reports, data, and information related to matters covered by this Agreement in the form requested by the County.
- (3) Audits and Inspections: At any time during normal business hours and as often as the County may deem necessary, there shall be made available to the County for examination all records with respect to all matters covered by this Agreement. The Contractor will permit the County to audit, examine, and make excerpts or transcripts from such records, and to audit all contracts, invoices, materials, payrolls, records of personnel, conditions of employment, and/or data relating to all matters covered by this Agreement.

O. Confidentiality

Contractor acknowledges that it may receive confidential information of the County and that it will protect the confidentiality of any such confidential information and will require any of its subcontractors, contractors, and/or staff to likewise protect such confidential information. The Contractor agrees that confidential information it receives or such reports, information, opinions, or conclusions that Contractor creates under this Agreement shall not be made available to, or discussed with, any individual or organization, including the news media, without prior written approval of the County. Contractor shall exercise reasonable precautions to prevent the unauthorized disclosure and use of County information whether specifically deemed confidential or not.

Contractor acknowledges that the County's disclosure of documentation is governed by Georgia's Open Record's Act, and Contractor further acknowledges that, if Contractor submits records containing trade secret information and if Contractor wishes to keep such records confidential, Contractor must submit and attach to such records an affidavit affirmatively declaring that specific information in the records constitutes trade secrets pursuant to Article 27 of Chapter 1 of Title 10, and the Parties shall follow the requirements of O.C.G.A. § 50-18-72(a)(34) related thereto.

P. Licenses, Certifications and Permits

The Contractor covenants and declares that it has obtained all diplomas, certificates, licenses, permits, or the like required by any and all national, state, regional, county, local boards, agencies, commissions, committees or other regulatory bodies in order to perform the Work contracted for under this Agreement; provided that some permits or licenses related to the Project may be obtained as part of the Work and shall be obtained as required. All work performed by Contractor under this Agreement shall be in accordance with applicable legal requirements and shall meet the standard of quality ordinarily expected of competent professionals. The Contractor shall furnish copies of all such permits, licenses, or approvals to the County within ten (10) days after issuance.

Q. Key Personnel

All of the individuals identified in Exhibit "G" are necessary for the successful completion of the Work due to their unique expertise and depth and breadth of experience. There shall be no change in Contractor's Project Manager or members of the project team, as listed in Exhibit "G", without written approval of the County. Contractor recognizes that the composition of this team was instrumental in the County's decision to award the work to Contractor and that compelling reasons for substituting these individuals must be demonstrated for the County's consent to be granted. Any substitutes shall be persons of comparable or superior expertise and experience. Failure to comply with the provisions of this Section shall constitute a material breach of Contractor's obligations under this Agreement and shall be grounds for termination. Contractor shall not subcontract with any third party for the performance of any portion of the Work without the prior written consent of the County. Contractor shall be solely responsible for any such subcontractors in terms of performance and compensation.

R. Authority to Contract

The Contractor covenants and declares that it has obtained all necessary approvals of its board of directors, stockholders, general partners, limited partners, or similar authorities to simultaneously execute and bind Contractor to the terms of this Agreement, if applicable.

S. Ownership of Work

All reports, designs, drawings, plans, specifications, schedules, work product, and other materials prepared or in the process of being prepared for the Work to be performed by the Contractor ("Materials") shall be the property of the County, and the County shall be entitled to full access and copies of all such Materials. Any such Materials remaining in the hands of the Contractor or subcontractor upon completion or termination of the Work shall be delivered immediately to the County. The Contractor assumes all risk of loss, damage or destruction of or to such Materials. If any Materials are lost, damaged, or destroyed before final delivery to the County, the Contractor shall replace them at its own expense. Any and all copyrightable subject matter in all Materials is hereby assigned to the County, and the Contractor agrees to execute any additional documents that may be necessary to evidence such assignment.

T. Meetings

The Contractor is required to meet with the County's personnel, or designated representatives, to resolve technical or contractual problems that may occur during the term of the contract at no additional cost to the County. Meetings will occur as problems arise and will be coordinated by the County. The Contractor will be given a minimum of three full working days notice of meeting date, time, and location. Face-to-face meetings are desired. However, at the Contractor's option and expense, a conference call meeting may be substituted. Consistent failure to participate in problem resolution meetings, two

consecutive missed or rescheduled meetings, or to make a good faith effort to resolve problems, may result in termination of the contract.

U. Nondiscrimination

In accordance with Title VI of the Civil Rights Act, as amended, 42 U.S.C. § 2000d, section 303 of the Age Discrimination Act of 1975, as amended, 42 U.S.C. § 6102, section 202 of the Americans with Disabilities Act of 1990, 42 U.S.C. § 12132, and all other provisions of Federal law, the Contractor agrees that, during performance of this Agreement, Contractor, for itself, its assignees and successors in interest, will not discriminate against any employee or applicant for employment, any subcontractor, or any supplier because of race, color, creed, national origin, gender, age or disability. In addition, Contractor agrees to comply with all applicable implementing regulations and shall include the provisions of this Section 7(U) in every subcontract for services contemplated under this Agreement.

Section 8. Covenants of the County

A. Right of Entry

The County shall provide for right of entry for Contractor to _____ in order for Contractor to complete the Work.

Section 9. Warranty

A. Warranty

Except as may be otherwise specified or agreed, the Contractor shall repair or replace all defects in materials, equipment, or workmanship appearing within one year from the date of Final Completion at no additional cost to the County. Further, Contractor shall provide all maintenance services, including parts and labor, for one year from the date of Final Completion at no additional cost to the County. An inspection shall be conducted by the County or its representative(s) near the completion of the one year general warranty period to identify any issues that must be resolved by the Contractor. After the expiration of such warranty period, County shall be responsible for repairing issues resulting from normal wear and tear and shall be responsible for general maintenance of the equipment; however, expiration of such warranty period shall not affect the Contractor's continued liability under an implied warranty of merchantability and fitness. All other warranties implied by law, including fitness for a particular purpose and suitability, are hereby preserved and shall apply in full force and effect beyond the one-year warranty period. County may purchase additional maintenance services from the Contractor upon a written proposal for such services being executed by authorized representatives of both Parties, and upon execution, such proposal for additional services shall be incorporated herein by this reference.

Section 10. Termination

A. The County may terminate this Agreement for convenience at any time upon providing

written notice thereof to Contractor at least seven (7) calendar days in advance of the termination date. In the event of a termination for convenience, Contractor shall take immediate steps to terminate work as quickly and effectively as possible and shall terminate all commitments to third-parties, unless otherwise instructed by the County. Provided that no damages are due to the County for Contractor's failure to perform in accordance with this Agreement, the County shall pay Contractor for work performed to date in accordance with Section 5 herein. The County shall have no further liability to Contractor for such termination. Further, at its sole discretion, the County may pay Contractor for additional value received as a result of Contractor's efforts, but in no case shall said payment exceed any remaining unpaid portion of the Contract Price.

- B. The County may terminate this Agreement for cause if Contractor breaches any material provision of this Agreement. The County shall give Contractor seven (7) days written notice of its intent to terminate the Agreement and the reasons therefore, and if Contractor, or its Surety, fails to cure the default within that period, the termination shall take place without further notice. The County shall then make alternative arrangements for completion of the Project. The County will make no payment to the Contractor or its Surety until all costs of completing the Project are paid. If the unpaid balance of the amount due the Contractor, according to this Agreement, exceeds the cost of finishing the Project, County shall provide payment to the Contractor (or its Surety) for services rendered and expenses incurred prior to the termination date, provided that such payment shall not exceed the unpaid balance of the amount otherwise payable under this Agreement minus the cost of completing the Project. If the costs of completing the Project exceed the unpaid balance, the Contractor or its Surety will pay the difference to the County.

The County reserves the right in termination for cause to take assignment of all contracts between the Contractor and its subcontractors, vendors, and suppliers. The County will promptly notify the Contractor of the contracts the County elects to assume. Upon receipt of such notice, the Contractor shall promptly take all steps necessary to effect such assignment.

- C. If the County terminates this Agreement for cause, and it is later determined that the County did not have grounds to do so, the termination will be treated as a termination for convenience under the terms of Section 10(A) above.
- D. Upon termination, the Contractor shall: (1) promptly discontinue all services affected, unless the notice directs otherwise; and (2) promptly deliver to the County all data, drawings, reports, summaries, and such other information and materials as may have been generated or used by the Contractor in performing this Agreement, whether completed or in process, in the form specified by the County.
- E. The Contractor shall have no right to terminate this agreement prior to completion of the Work, except in the event of the County's failure to pay the Contractor within thirty (30) days of Contractor providing the County with notice of a delinquent payment and an opportunity to cure.

- F. The rights and remedies of the County and the Contractor provided in this Section are in addition to any other rights and remedies provided under this Agreement or at law or in equity.

Section 11. Miscellaneous

- A. Defined Terms. Terms used in this Agreement shall have their ordinary meaning, unless otherwise defined below or elsewhere in the Contract Documents.
- (i) "Final Completion" means when the Work has been completed in accordance with terms and conditions of the Contract Documents.
- B. Complete Agreement. This Agreement, including the Contract Documents, constitutes the complete agreement between the Parties and supersedes any and all other agreements, either oral or in writing, between the Parties with respect to the subject matter of this Agreement. No other agreement, statement, or promise relating to the subject matter of this Agreement not contained in this Agreement or the Contract Documents shall be valid and binding. This Agreement may be modified or amended only by a written document signed by representatives of both Parties with appropriate authorization.
- C. Governing Law. This Agreement shall be governed by and construed under the laws of the State of Georgia. If any action at law or in equity is brought to enforce or interpret the provisions of this Agreement, the rules, regulations, statutes and laws of the State of Georgia will control. Any action or suit related to this Agreement shall be brought in the Superior Court of Barrow County, Georgia.
- D. Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original, but all of which together shall constitute one and the same instrument.
- E. Invalidity of Provisions; Severability. Should any article(s) or section(s) of this Agreement, or any part thereof, later be deemed unenforceable by a court of competent jurisdiction, the offending portion of the Agreement should be severed, and the remainder of this Agreement shall remain in full force and effect to the extent possible as if this Agreement had been executed with the invalid portion hereof eliminated, it being the intention of the parties that they would have executed the remaining portion of this Agreement without including any such part, parts, or portions which may for any reason be hereafter declared invalid.
- F. Business License. Prior to commencement of the Work to be provided hereunder, Contractor shall apply to the County for a business license, pay the applicable business license fee, and maintain said business license during the term of this Agreement.

G. Notices.

(1) Communications Relating to Day-to-Day Activities.

All communications relating to the day-to-day activities of the Work shall be exchanged between _____ for the County and _____ for the Contractor.

(2) Official Notices.

All other notices, requests, demands, writings, or correspondence, as required by this Agreement, shall be in writing and shall be deemed received, and shall be effective, when (1) personally delivered, or (2) on the third day after the postmark date when mailed by certified mail, postage prepaid, return receipt requested, or (3) upon actual delivery when sent *via* national overnight commercial carrier to the Parties at the addresses given below, or at a substitute address previously furnished to the other Parties by written notice in accordance herewith:

NOTICE TO THE COUNTY shall be sent to:

County Manager
c/o Barrow County Board of Commissioners
30 North Broad Street
Winder, GA 30680

NOTICE TO CONTRACTOR shall be sent to:

Future changes in address shall be effective only upon written notice being given by the County to the Contractor or by the Contractor to the County Manager via one of the delivery methods described in this Section.

H. Waiver of Agreement. No failure by the County to enforce any right or power granted under this Agreement, or to insist upon strict compliance by Contractor with this Agreement, and no custom or practice of the County at variance with the terms and conditions of this Agreement shall constitute a general waiver of any future breach or default or affect the County's right to demand exact and strict compliance by Contractor with the terms and conditions of this Agreement.

I. Sovereign Immunity. Nothing contained in this Agreement shall be construed to be a waiver of the County's sovereign immunity or any individual's qualified good faith or official immunities.

- J. No Personal Liability. Nothing herein shall be construed as creating any individual or personal liability on the part of any County Party. No County Party shall be personally liable to the Contractor or any successor in interest in the event of any default or breach by the County or for any amount which may become due to the Contractor or successor or on any obligation under the terms of this Agreement. Likewise, Contractor's performance of services under this Agreement shall not subject Contractor's individual employees, officers, or directors to any personal liability. The Parties agree that their sole and exclusive remedy, claim, demand, or suit shall be directed and/or asserted only against Contractor or the County, respectively, and not against any employee, officer, director, or elected or appointed official.

- K. Force Majeure. Neither the County nor Contractor shall be liable for their respective non-negligent or non-willful failure to perform or shall be deemed in default with respect to the failure to perform (or cure a failure to perform) any of their respective duties or obligations under this Agreement or for any delay in such performance due to: (i) any cause beyond their respective reasonable control; (ii) any act of God; (iii) any change in applicable governmental rules or regulations rendering the performance of any portion of this Agreement legally impossible; (iv) earthquake, fire, explosion, or flood; (v) strike or labor dispute, excluding strikes or labor disputes by employees and/or agents of CONTRACTOR; (vi) delay or failure to act by any governmental or military authority; or (vii) any war, hostility, embargo, sabotage, civil disturbance, riot, insurrection, or invasion. In such event, the time for performance shall be extended by an amount of time equal to the period of delay caused by such acts, and all other obligations shall remain intact.

- L. Headings. All headings herein are intended for convenience and ease of reference purposes only and in no way define, limit, or describe the scope or intent thereof, or of this Agreement, nor in any way affect this Agreement.

- M. No Third Party Rights. This Agreement shall be exclusively for the benefit of the Parties and shall not provide any third parties with any remedy, claim, liability, reimbursement, cause of action, or other right.

- N. Successors and Assigns. Each Party binds itself, its partners, successors, assigns, and legal representatives to the other Party hereto, its partners, successors, assigns, and legal representatives with respect to all covenants, agreements, and obligations contained in the Contract Documents.

IN WITNESS WHEREOF, the County and the Contractor have executed this Agreement effective as of the date first above written.

[SIGNATURES ON FOLLOWING PAGE]

CONTRACTOR: _____

BARROW COUNTY, GEORGIA

By: _____

_____, _____
[NAME AND TITLE]

_____, _____
[NAME AND TITLE]

[CORPORATE SEAL]

[COUNTY SEAL]

SIGNED, SEALED, AND DELIVERED
in the presence of:

SIGNED, SEALED, AND DELIVERED
in the presence of:

Witness

Witness

Notary Public

Notary Public

[NOTARY SEAL]

[NOTARY SEAL]

My Commission Expires:

My Commission Expires:

EXHIBIT "A"

[INSERT _____ (PROPOSAL/BID) DOCUMENTS FROM CONTRACTOR]

EXHIBIT "B"
NONCOLLUSION AFFIDAVIT OF PRIME (PROPOSER/BIDDER)

STATE OF GEORGIA
COUNTY OF BARROW

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

(1) He is _____ (Owner, Partner, Officer, Representative, or Agent) of _____ (the " _____ " (Proposer/Bidder)) that has submitted the attached _____ (Proposal/Bid);

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

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

(4) Neither the said _____ (Proposer/Bidder) nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, included in this affidavit, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other _____ (Proposer/Bidder), firm or person to submit a collusive or sham _____ (Proposal/Bid) in connection with the Contract for which the attached _____ (Proposal/Bid) has been submitted to or refrain from proposing in connection with such Contract, or has in any collusion or communication or conference with any other _____ (Proposer/Bidder), firm or person to fix the price or prices in the attached _____ (Proposal/Bid) or of any other _____ (Proposer/Bidder), or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against Barrow County or any person interested in the proposed Contract; and,

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

(6) _____ (Proposer/Bidder) has not directly or indirectly violated any law, ordinance or regulation related to the _____ (Proposal/Bid).

Signature of Authorized Officer or Agent

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

Printed Name and Title of Authorized Officer or Agent

Notary Public

[NOTARY SEAL]

My Commission Expires: _____

EXHIBIT "C"

FINAL AFFIDAVIT

TO BARROW COUNTY, GEORGIA

I, _____, hereby certify that all suppliers of materials, equipment and service, subcontractors, mechanics, and laborers employed by _____ or any of its subcontractors in connection with the construction of _____ for Barrow County have been paid and satisfied in full as of _____, 20____, and that there are no outstanding obligations or claims of any kind for the payment of which Barrow County on the above named project might be liable, or subject to, in any lawful proceeding at law or in equity.

Signature

Title

Personally appeared before me this ____ day of _____, 20____. _____, who under oath deposes and says that he is _____ of the firm of _____, that he has read the above statement, and that to the best of his knowledge and belief same is an exact true statement.

Notary Public

[NOTARY SEAL]

My Commission Expires

EXHIBIT "D"

STATE OF GEORGIA

COUNTY OF BARROW

CONTRACTOR AFFIDAVIT AND AGREEMENT

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm, or corporation which is engaged in the physical performance of services on behalf of Barrow County has registered with, is authorized to use, and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91.

Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period, and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b).

Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Contractor

Name of Project

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.
Executed on _____, __, 20__ in _____
(city), _____ (state).

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

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

Notary Public

[NOTARY SEAL]

My Commission Expires:

EXHIBIT "E"

**STATE OF GEORGIA
COUNTY OF BARROW**

SUBCONTRACTOR AFFIDAVIT

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract with _____ (name of contractor) on behalf of Barrow County has registered with, is authorized to use, and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned subcontractor will continue to use the federal work authorization program throughout the contract period, and the undersigned subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the subcontractor with the information required by O.C.G.A. § 13-10-91(b). Additionally, the undersigned subcontractor will forward notice of the receipt of an affidavit from a sub-subcontractor to the contractor within five (5) business days of receipt. If the undersigned subcontractor receives notice that a sub-subcontractor has received an affidavit from any other contracted sub-subcontractor, the undersigned subcontractor must forward, within five (5) business days of receipt, a copy of the notice to the contractor.

Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification
Number

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

Date of Authorization

Executed on _____, __, 2015 in _____(city),
_____(state).

Name of Subcontractor

Signature of Authorized Officer or Agent

Name of Project

Printed Name/Title of Authorized Officer or Agent

Name of Public Employer

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF
_____, 201__.

NOTARY PUBLIC

[NOTARY SEAL]

My Commission Expires: _____

EXHIBIT "F"

[MODIFICATIONS TO PLANS AND SPECIFICATIONS TO BE INSERTED (IF ISSUED)]

EXHIBIT "H"

[INSERT AGREEMENT FOR CONTRACT ADMINISTRATION WITH
_____ (NAME TO BE DETERMINED)(IF ISSUED)]

EXHIBIT "I"

[INSERT GENERAL CONDITIONS (IF ISSUED)]

EXHIBIT "J"

[INSERT SUPPLEMENTARY CONDITIONS (IF ISSUED)]

EXHIBIT "K"

[INSERT NOTICE OF AWARD]

SECTION VI
PERFORMANCE BOND
BARROW COUNTY BOARD OF COMMISSIONERS
WINDER, GEORGIA

KNOW ALL MEN BY THESE PRESENTS THAT _____ (as CONTRACTOR, hereinafter referred to as the “Principal”), and _____ (as SURETY COMPANY, hereinafter referred to as the “CONTRACTOR’S SURETY”), are held and firmly bound unto Barrow County Board of Commissioners, Winder, Georgia, (as OWNER, hereinafter referred to as the “County”), for the use and benefit of any “Claimant,” as hereinafter defined, in the sum of _____ Dollars (\$_____), lawful money of the United States of America, for the payment of which the Principal and the Contractor’s Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered, or is about to enter, into a certain written agreement with the County, dated the ___ of _____, 20__ which is incorporated herein by reference in its entirety (hereinafter referred to as the “CONTRACT”), for the construction of a project known as **Tanners Bridge Road_LAS Mechanical Screening Facilities**, (hereinafter referred to as “the PROJECT”).

NOW THEREFORE, the conditions of this obligation are as follows:

1. That if the Principal shall fully and completely perform each and all of the terms, provisions and requirements of the Contract, including and during the period of any warranties or guarantees required thereunder, and all modifications, amendments, changes, deletions, additions, and alterations thereto that may hereafter be made, and if the Principal and the Contractor’s Surety shall indemnify and hold harmless the County from any and all losses, liability and damages, claims, judgments, liens, costs and fees of every description, including but not limited to, any damages for delay, which the County may incur, sustain or suffer by

reason of the failure or default on the part of the Principal in the performance of any and all of the terms, provisions and requirements of the Contract, including all modifications, amendments, changes, deletions, additions, and alterations thereto and any warranties or guarantees required thereunder, then this obligation shall be void; otherwise to remain in full force and effect;

2. In the event of a failure of performance of the Contract by the Principal, which shall include, but not be limited to, any breach of default of the Contract:
 - a. The Contractor's Surety shall commence performance of its obligations and undertakings under this Bond no later than thirty (30) days after written notice from the County to the Contractor's Surety; and
 - b. The means, method or procedure by which the Contractor's Surety undertakes to perform its obligations under this Bond shall be subject to the advance written approval of the County.

The Contractor's Surety hereby waives notice of any and all modifications, omissions, additions, changes and advance payments or deferred payments in or about the Contract, and agrees that the obligations undertaken by this Bond shall not be impaired in any manner by reason of any such modifications, omissions, additions, changes, and advance payments or deferred payments. The Parties further expressly agree that any action on this Bond may be brought within the time allowed by Georgia law for suit on contracts under seal.

IN WITNESS WHEREOF, the principal and Contractor's Surety have hereunto affixed their corporate seals and caused this obligation to be signed by their duly authorized officers or attorneys-in-fact, this day of _____, 20__.

(Name of Principal)

By: _____

Title: _____ (SEAL)

Attest: _____

Title: _____

Date: _____

(Name of Contractor's Surety)

By: _____

Title: _____ (SEAL)

Attest: _____

Title: _____

Date: _____

(ATTACH SURETY'S POWER OF ATTORNEY)

**SECTION VII
PAYMENT BOND
BARROW COUNTY BOARD OF COMMISSIONERS
WINDER, GEORGIA**

KNOW ALL MEN BY THESE PRESENTS THAT _____ (as CONTRACTOR, hereinafter referred to as the "Principal"), and _____ (as SURETY COMPANY, hereinafter referred to as the "CONTRACTOR'S SURETY"), are held and firmly bound unto Barrow County Board of Commissioners, Winder, Georgia, (as OWNER, hereinafter referred to as the "County"), for the use and benefit of any "Claimant," as hereinafter defined, in the sum of _____ Dollars (\$_____), lawful money of the United States of America, for the payment of which the Principal and the Contractor's Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered, or is about to enter, into a certain written agreement with the County, dated the ____ of _____, 20__ which is incorporated herein by reference in its entirety (hereinafter referred to as the "CONTRACT"), for the construction of a project known as **Tanners Bridge Road_Mechanical Screening Facilities**, (hereinafter referred to as "the PROJECT").

NOW THEREFORE, the conditions of this obligation is such that if the Principal shall promptly make payment to any Claimant, as hereinafter defined, for all labor, services and materials used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise to remain in full force and effect.

A "Claimant" shall be defined herein as any Subcontractor, person, Party, partnership, corporation or other entity furnishing labor, services or materials used or reasonably required for use in the performance of the Contract, without regard to whether such labor, services or materials were sold, leased or rented, and without regard to whether such Claimant is or is not in privity of the Contract with the Principal or any Subcontractor performing Work on the Project.

In the event of any claim made by the Claimant against the County, or the filing of a Lien against the property of the County affected by the Contract, the Contractor's Surety shall either settle or resolve the Claim and shall remove any such Lien by bond or otherwise as provided in the Contract.

The Parties further expressly agree that any action on this Bond may be brought within the time allowed by Georgia law for suit on contracts under seal.

IN WITNESS WHEREOF, the principal and Contractor's Surety have hereunto affixed their corporate seals and caused this obligation to be signed by their duly authorized officers or attorneys-in-fact, this day of _____, 20____.

(Name of Principal)

By: _____

Title: _____ (SEAL)

Attest: _____

Title: _____

Date: _____

(Signatures Continued on Next Page)

(Name of Contractor's Surety)

By: _____

Title: _____ (SEAL)

Attest: _____

Date: _____

(ATTACH SURETY'S POWER OF ATTORNEY)

**SECTION IX
GENERAL CONDITIONS
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ARTICLE 1--DEFINITIONS

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

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

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

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

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

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

Change Order - A document recommended by ENGINEER, which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion or revision in the WORK, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.

Contract Documents - The Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR'S Bid (including documentation accompanying the Bid and any post-Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications

and the Drawings as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements issued pursuant to paragraphs 3.4 and 3.5 on or after the Effective Date of the Agreement.

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

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

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

Defective - An adjective which when modifying the word WORK refers to WORK that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER'S recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.8 or 14.10).

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

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

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

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

* General Requirements - Sections of Division I of the Specifications.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 2 - PRELIMINARY MATTERS

Delivery of Bonds:

2.1 CONTRACTOR shall deliver to OWNER required Bonds in accordance with paragraph 5.1.

Copies of Documents:

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

Commencement of Contract Time; Notice to Proceed:

2.3 The Contract Time will commence to run on the date indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within thirty days after the Effective Date of the Agreement. In no event will the Contract Time commence to run later than the thirtieth day after the Effective Date of the Agreement.

Starting the Project:

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

Before Starting Construction:

2.5 Before undertaking each part of the WORK, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any WORK

affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Contract Documents, unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

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

2.6.1 an estimated progress schedule indicating the starting and completion dates of the various stages of the WORK;

2.6.2 a preliminary schedule of Shop Drawing submissions; and

2.6.3 a preliminary schedule of values for all of the WORK which will include quantities and prices of items aggregating the Contract Price and will subdivide the WORK into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of WORK which will be confirmed in writing by CONTRACTOR at the time of submission.

2.7 Before any WORK at the site is started, CONTRACTOR shall deliver to OWNER, with a copy to ENGINEER, certificates (and other evidence of insurance requested by OWNER) which CONTRACTOR is required to purchase and maintain in accordance with paragraphs 5.1 and 5.2, and OWNER shall deliver to CONTRACTOR certificates (and other evidence of insurance requested by CONTRACTOR) which OWNER is required to purchase and maintain in accordance with paragraphs 5.4 and 5.5.

Preconstruction Conference:

2.8 Within twenty days after the Effective Date of the Agreement, but before CONTRACTOR starts the WORK at the site, a conference attended by CONTRACTOR, ENGINEER and others as appropriate will be held to discuss the schedules referred to in paragraph 2.6, to discuss procedures for handling Shop Drawings and other submittals and for processing Applications for Payment, and to establish a working understanding among the parties as to the WORK.

Finalizing Schedules:

2.9 At least ten days before submission of the first Application for Payment, CONTRACTOR, ENGINEER and others as appropriate will finalize the schedules submitted in accordance with paragraph 2.6. The finalized progress schedule will be acceptable to ENGINEER as providing an orderly progression of the WORK to completion within the Contract Time, but such acceptance will neither impose on ENGINEER responsibility for the progress or scheduling of the WORK nor relieve CONTRACTOR from full responsibility therefor. The finalized schedule of Shop Drawing submissions will be acceptable to ENGINEER as providing a workable arrangement for processing the submissions. The finalized schedule of values will be acceptable to ENGINEER as to form and substance.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

Intent:

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

the law of the place of the Project.

3.2 It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any WORK, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied whether or not specifically called for. When words which have a well known technical or trade meaning are used to describe WORK, materials or equipment, such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or Laws or Regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to ENGINEER, or any of ENGINEER'S consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in paragraph 9.4.

3.3 If, during the performance of the WORK, CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, CONTRACTOR shall so report to ENGINEER in writing at once and before proceeding with the WORK affected thereby shall obtain a written interpretation or clarification from ENGINEER; however, CONTRACTOR shall not be

liable to OWNER or ENGINEER for failure to report any conflict, error or discrepancy in the Contract Documents unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

Amending and Supplementing Contract Documents:

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

3.4.1 a formal Written Amendment,

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

3.4.3 a WORK Directive Change (pursuant to paragraph 10.1).As indicated in paragraph 11.2 and 12.1, Contract Price and Contract Time may only be changed by a Change Order or a Written Amendment.

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

3.5.1 a Field Order (pursuant to paragraph 9.5),

3.5.2 ENGINEER'S review of a Shop Drawings or sample (pursuant to paragraphs 6.26 and 6.27), or

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

Reuse of Documents:

3.6 Neither CONTRACTOR nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the WORK under a direct or indirect contract with OWNER shall have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents

(or copies of any thereof) prepared by or bearing the seal of ENGINEER; and they shall not reuse any of them on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaptation by ENGINEER.

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

Availability of Lands:

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

Physical Conditions:

4.2.1 Explorations and Reports: Reference is made to the Supplementary Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by ENGINEER in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such reports, but not upon nontechnical data, interpretations or opinions contained therein or for the completeness thereof for CONTRACTOR'S purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to subsurface conditions at the site.

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

4.2.3 Report of Differing Conditions:

If CONTRACTOR believes that:

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

4.2.3.2 any physical condition uncovered or revealed at the site differs materially from that indicated, reflected or referred to in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before performing any WORK in connection therewith (except in an emergency as permitted by paragraph 6.22), notify OWNER and ENGINEER in writing about the inaccuracy or difference.

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

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

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

Physical Conditions - Underground Facilities:

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

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

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

4.3.2 Not Shown or Indicated: If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of, CONTRACTOR shall, promptly after becoming aware thereof and before performing any WORK affected thereby (except in an emergency as permitted by paragraph 6.22), identify the OWNER of such Underground Facility and give written notice thereof to that OWNER and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.20. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of. If the parties are unable to agree as to the amount or length thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

Reference Points:

4.4 OWNER shall provide engineering surveys to establish reference points for construction which in ENGINEER'S judgment are necessary to enable CONTRACTOR to proceed with the WORK. CONTRACTOR shall be responsible for laying out the WORK (unless otherwise specified in the General Requirements), shall protect and reserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to

ENGINEER whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.

ARTICLE 5 - BONDS AND INSURANCE

Performance and Other Bonds:

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

5.2 If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.3, CONTRACTOR shall within five days thereafter substitute another Bond and Surety, both of which must be acceptable to OWNER.

CONTRACTOR'S Liability Insurance:

5.3 See "Insurance" Section of the Construction Agreement.

Contractual Liability Insurance:

5.4 See "Insurance" Section of the Construction Agreement.

OWNER'S Liability Insurance:

5.5 See "Insurance" Section of the Construction Agreement.

Property Insurance:

Section 5.6 is Deleted

Waiver of Rights:

5.7. See Construction Agreement.

Receipt and Application of Proceeds:

Section 5.8 is Deleted.

Acceptance of Insurance:

5.10 If OWNER has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by CONTRACTOR in accordance with paragraphs 5.1 and 5.2 on the basis of its not complying with the Contract Documents, OWNER shall notify CONTRACTOR in writing thereof within ten days of the date of delivery of such certificates to OWNER in accordance with paragraph 2.7. If CONTRACTOR has any objection to the coverage afforded by or other provisions of the policies of insurance required to be purchased and maintained by OWNER on the basis of their not complying with the Contract Documents, CONTRACTOR shall notify OWNER in writing thereof within ten days of the date of delivery of such certificates to CONTRACTOR in accordance with paragraph 2.7. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided by each as the other may

reasonably request. Failure by OWNER or CONTRACTOR to give any such notice of objection within the time provided shall constitute acceptance of such insurance purchased by the other as complying with the Contract Documents.

Partial Utilization - Property Insurance:

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

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

Supervision and Superintendence:

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

6.2 CONTRACTOR shall keep on the WORK at all times during its progress a competent resident superintendent, who shall not be replaced without

written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR'S representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

Labor, Materials and Equipment:

6.3 CONTRACTOR shall provide competent, suitable qualified personnel to survey and lay out the WORK and perform construction as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site.

6.4 Unless otherwise specified in the General Requirements, CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the WORK.

6.5 All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to ENGINEER, or any of ENGINEER'S consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 to 9.16.

Adjusting Progress Schedule:

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

Substitutes or "Or-Equal" Items:

6.7.1 Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by ENGINEER if sufficient information is submitted by CONTRACTOR to allow ENGINEER to determine that the material or equipment proposed is equivalent or equal to that named. The procedure for review by ENGINEER will include the following as supplemented in the General Requirements. Requests for review of substitute items of material and equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall make written application to ENGINEER for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice CONTRACTOR'S achievement of Substantial Completion on time, whether or not acceptance of the substitute for use in the WORK will require a change in any of the Contract Documents (or in the provisions of any other direct contract with

OWNER for WORK on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the WORK is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other CONTRACTORS affected by the resulting change, all of which shall be considered by ENGINEER in evaluating the proposed substitute. ENGINEER may require CONTRACTOR to furnish at CONTRACTOR'S expense additional data about the proposed substitute.

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

6.7.3 ENGINEER will be allowed a reasonable time within which to evaluate each proposed substitute. ENGINEER will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without ENGINEER'S prior written acceptance which will be evidenced by either a Change Order or a reviewed Shop Drawing. OWNER may require CONTRACTOR to furnish at CONTRACTOR'S expense a special performance guarantee or other surety with respect to any substitute. ENGINEER will record time required by ENGINEER and ENGINEER'S consultants in evaluat-

ing substitutions proposed by CONTRACTOR and in making changes in the Contract Documents occasioned thereby. Whether or not ENGINEER accepts a proposed substitute, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER'S consultants for evaluating each proposed substitute.

Concerning Subcontractors, Suppliers and Others:

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

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

organization shall constitute a waiver of any right of OWNER or ENGINEER to reject defective WORK.

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

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

6.11 All WORK performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER and contains waiver provisions as required by paragraph 5.8. CONTRACTOR shall pay each Subcontractor a just share of any insurance moneys received by CONTRACTOR on account of losses under policies issued pursuant to paragraph 5.4 and 5.5.

Patent Fees and Royalties:

6.12 CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the WORK or the incorporation in the WORK of any invention, design, process, product or device which is the subject of patent

rights or copyrights held by others. If a particular invention, design, process, product or device is specified in the Contract Documents for use in the performance of the WORK and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. CONTRACTOR shall indemnify and hold harmless OWNER and ENGINEER and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorneys' fees and court and arbitration costs) arising out of any infringement of patent rights or copyrights incident to the use in the performance of the WORK or resulting from the incorporation in the WORK of any invention, design, process, product or device not specified in the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights.

Permits:

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

Laws and Regulations:

6.14.1 CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the WORK. Except where otherwise expressly required by applicable

Laws and Regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR'S compliance with any Laws or Regulations.

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

Taxes:

6.15 CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the WORK.

Uses of Premises:

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

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

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

6.18 CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the WORK or adjacent property to stresses or pressures that will endanger it.

Record Documents:

6.19 CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, WORK Directive Changes, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during

construction. These record documents together with all approved samples and a counterpart of all reviewed Shop Drawings will be available to ENGINEER for reference. Upon completion of the WORK, these record documents, samples and Shop Drawings will be delivered to ENGINEER for OWNER.

Safety and Protection:

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

6.20.1 all employees on the WORK and other persons and organizations who may be affected thereby;

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

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

CONTRACTOR shall comply with all applicable Laws and Regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

CONTRACTOR shall notify OWNERS of adjacent property and of Underground Facilities and utility OWNERS when prosecution of the WORK may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any

property referred to in paragraph 6.20.2 or 6.20.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the WORK or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR). CONTRACTOR'S duties and responsibilities for the safety and protection of the WORK shall continue until such time as all the WORK is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.13 that the WORK is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.21 CONTRACTOR shall designate a responsible representative at the site whose duty shall be the prevention of accidents. This person shall be CONTRACTOR'S superintendent unless otherwise designated in writing by CONTRACTOR to OWNER.

Emergencies:

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

variations.

Shop Drawings and Samples:

6.23 After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, CONTRACTOR shall submit to ENGINEER for review in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.9), or for other appropriate action if so indicated in the Supplementary Conditions, three copies plus the number of copies required by the CONTRACTOR (unless otherwise specified in the General Requirements) of all Shop Drawings, which will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR'S responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as ENGINEER may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable ENGINEER to review the information as required.

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

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

WORK and the Contract Documents.

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

6.26 ENGINEER will review with reasonable promptness Shop Drawings and samples, but ENGINEER'S review will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make corrections required by ENGINEER, and shall return the required number of corrected copies of Shop Drawings and submit as required new samples for review. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals.

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

from responsibility for having complied with the provisions of paragraph 6.25.1.

6.28 Where a Shop Drawing or sample is required by the Specifications, any related WORK performed prior to ENGINEER'S review of the pertinent submission will be the sole expense and responsibility of CONTRACTOR.

Continuing the WORK:

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

Indemnification:

6.30 See Construction Agreement.

ARTICLE 7 - OTHER WORK

Related WORK at Site:

7.1 OWNER may perform other WORK related to the Project at the site by OWNER'S own forces, have other WORK performed by utility OWNERS or let other direct contracts therefor which shall contain General Conditions similar to these. If the fact that such other WORK is to be performed was not noted in the Contract Documents, written notice thereof will be given to CONTRACTOR prior to starting any such other WORK; and, if CONTRACTOR believes that such performance will involve additional expense to CONTRACTOR or requires additional time and the parties are unable to agree as to the extent thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

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

7.3 If any part of the CONTRACTOR'S WORK depends for proper execution or results upon the WORK of any such other CONTRACTOR or utility OWNER (or OWNER), CONTRACTOR shall inspect and promptly report to ENGINEER in writing any delays, defects or deficiencies in such WORK that render it unavailable or unsuitable for such proper execution and results. CONTRACTOR'S failure so to report will constitute an acceptance of the other WORK as fit and proper for integration with CONTRACTOR'S WORK except for latent or nonapparent defects and deficiencies in the other WORK.

Coordination:

7.4 If OWNER contracts with others for the performance of other WORK on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime CONTRACTORS

will be identified in the Supplementary Conditions, and the specific matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided, in the Supplementary Conditions. Unless otherwise provided in the Supplementary Conditions, neither OWNER nor ENGINEER shall have any authority or responsibility in respect of such coordination.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.1 OWNER shall issue all communications to CONTRACTOR through ENGINEER.

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

8.3 OWNER shall furnish the data required of OWNER under the Contract Documents promptly and shall make payments to CONTRACTOR promptly after they are due as provided in paragraphs 14.4 and 14.13.

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

8.5 OWNER'S responsibilities in respect of purchasing and maintaining liability and property insurance are set forth in paragraphs 5.3 through 5.6.

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

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

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

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

OWNER'S Representative:

9.1 ENGINEER will be OWNER'S representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER as OWNER'S representative during construction are set forth in the Contract Documents and shall not be extended without written consent of OWNER and ENGINEER.

Visits to Site:

9.2 ENGINEER will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed WORK and to determine, in general, if the WORK is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the WORK. ENGINEER'S efforts will be directed toward providing for OWNER a greater degree of confidence that the completed WORK will conform to the Contract Documents. On the basis of such visits and on-site observations as an experienced and qualified design professional, ENGINEER will keep OWNER informed of the progress of the WORK and will endeavor to guard OWNER against defects and deficiencies in the WORK.

Project Representation:

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

Clarifications and Interpretations:

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

Authorized Variations in WORK:

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

therefor as provided in Article 11 or 12.

Rejecting Defective WORK:

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

Shop Drawings, Change Orders and Payments:

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

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

9.9 In connection with ENGINEER'S responsibilities in respect of Application for Payment, see Article 14.

Determinations for Unit Prices:

9.10 ENGINEER will determine the actual quantities and classifications of Unit Price WORK performed by CONTRACTOR. ENGINEER will review with CONTRACTOR ENGINEER'S preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). ENGINEER'S written decisions thereon will be final and binding upon OWNER and CONTRACTOR, unless, within ten days after the date of any such decision, either OWNER or CONTRACTOR delivers to the other party to the Agreement and to ENGINEER written notice of intention to appeal from such a decision.

Decisions on Disputes:

9.11 ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the WORK thereunder.

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

9.12 When functioning as interpreter and judge under paragraphs 9.10 and 9.11, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by ENGINEER pursuant to paragraphs 9.10 and 9.11 with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.16) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such claim, dispute or other matter.

Limitations on ENGINEER'S Responsibilities:

9.13 Neither ENGINEER'S authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority shall give rise to any duty or

responsibility of ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization performing any of the WORK, or to any surety for any of them.

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

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

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

ARTICLE 10 - CHANGES IN THE WORK

10.1 Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the WORK; these will be authorized by a Written Amendment, a Change Order, or a WORK Directive Change. Upon receipt

of any such document, CONTRACTOR shall promptly proceed with the WORK involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

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

10.3 CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any WORK performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraphs 3.4 and 3.5, except in the case of an emergency as provided in paragraph 6.22 and except in the case of uncovering WORK as provided in paragraph 13.9.

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

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

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

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

provided that, in lieu of executing any such Change Order, an appeal may be taken from any such

decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the WORK and adhere to the progress schedule as provided in paragraph 6.29.

10.5 If notice of any change affecting the general scope of the WORK or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Time) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR'S responsibility, and the amount of each applicable Bond will be adjusted accordingly.

ARTICLE 11 - CHANGE OF CONTRACT PRICE

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

11.2 The Contract Price may only be changed by a Change Order or by a Written Amendment. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to ENGINEER promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within sixty days after such occurrence (unless ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Price shall be determined by ENGINEER in accordance with paragraph 9.11 if OWNER and

CONTRACTOR cannot otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this paragraph 11.2.

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

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

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

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

Cost of the WORK:

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

11.4.1 Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the WORK under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Payroll costs for employees not employed full time on the WORK shall be apportioned on the basis of their time spent on the WORK. Payroll costs shall

include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing WORK after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above.

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

11.4.3 Payments made by CONTRACTOR to the Subcontractors for WORK performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of ENGINEER, which bids will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the WORK Plus a Fee, the Subcontractor's Cost of the WORK shall be determined in the same manner as CONTRACTOR'S Cost of the WORK. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

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

WORK.

11.4.5 Supplemental costs including the following:

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

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

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

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

11.4.5.5 Deposits lost for cause other than negligence of CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

11.4.5.6 Losses and damages (and related expenses), not compensated by insurance or otherwise, to the WORK or otherwise sustained by CONTRACTOR in connection with the performance and furnishing of the WORK (except losses and damages within the deductible amounts of

property insurance established by OWNER in accordance with paragraph 5.7), provided they have resulted from causes other than the negligence of CONTRACTOR, and Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses shall be included in the Cost of the WORK for the purpose of determining CONTRACTOR'S Fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid for services a fee proportionate to that stated in paragraph 11.6.2.

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

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

11.4.5.9 Cost of premiums for additional Bonds and insurance required because of changes in the WORK and premiums for property insurance coverage within the limits of the deductible amounts established by OWNER in accordance with paragraph 5.7.

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

11.5.1 Payroll costs and other compensation of CONTRACTOR'S officers, executives, principals (of partnership and sole proprietorships), general managers, ENGINEERS, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR'S principal or a branch office for general administration of the WORK and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.4.1 or specifically covered by

paragraph 11.4.4 - all of which are to be considered administrative costs covered by the CONTRACTOR'S Fee.

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

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

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

11.5.5 Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective WORK, disposal of materials or equipment wrongly supplied and making good any damage to property.

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

CONTRACTOR'S Fee:

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

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

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

11.6.2.1 for costs incurred under paragraphs 11.4.1

and 11.4.2, the CONTRACTOR'S Fee shall be fifteen percent;

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

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

11.6.2.4 the amount of credit to be allowed by CONTRACTOR to OWNER for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR'S Fee by an amount equal to ten percent of the net decrease; and

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

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

Cash Allowances:

11.8 It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the WORK so covered to be done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to ENGINEER. CONTRACTOR agrees that:

11.8.1 The allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the

allowances to be delivered at the site, and all applicable taxes; and

11.8.2 CONTRACTOR'S costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

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

Unit Price WORK:

11.9.1 Where the Contract Documents provide that all or part of the WORK is to be Unit Price WORK, initially the Contract Price will be deemed to include for all Unit Price WORK an amount equal to the sum of the established unit prices for each separately identified item of Unit Price WORK times the estimated quantity of each item as indicated in the Proposal. The estimated quantities of items of Unit Price WORK are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price WORK performed by CONTRACTOR will be made by ENGINEER in accordance with Paragraph 9.10.

11.9.2 Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR'S overhead and profit for each separately identified item.

11.9.3 Where the quantity of any item of Unit Price WORK performed by CONTRACTOR differs by more than twenty-five percent from the estimated quantity of such item indicated in the Proposal and there is no corresponding adjustment with respect to any other item of WORK and if CONTRACTOR believes that CONTRACTOR has incurred additional

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

ARTICLE 12 - CHANGE OF CONTRACT TIME

Section 12.1 Deleted

Section 12.2 Deleted

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

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

Warranty and Guarantee:

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

Access to WORK:

13.2 ENGINEER and ENGINEER'S representatives, other representatives of OWNER, testing agencies and governmental agencies with jurisdictional interests will have access to the WORK at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide proper and safe conditions for such access.

Tests and Inspections:

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

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

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

13.6 If any WORK (including the WORK of others) that is to be inspected, tested or approved is covered without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation. Such uncovering shall be at CONTRACTOR'S expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR'S intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.

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

Uncovering WORK:

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

13.9 If ENGINEER considers it necessary or advisable that covered WORK be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER'S request, shall uncover, expose or otherwise make available for observation, inspection or testing as ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, material and equipment. If it is found that such WORK is defective, CONTRACTOR shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of ENGINEERS, architects, attorneys and other professionals), and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, may make a claim therefor as provided in Article 11. If, however, such WORK is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction; and, if the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a claim therefor as provided in Articles 11 and 12.

OWNER May Stop the WORK:

13.10 If the WORK is defective, or CONTRACTOR fails to supply sufficiently skilled Workers or suitable materials or equipment, or fails to furnish or perform the WORK in such a way that the completed WORK will conform to the Contract Documents, the OWNER may order CONTRACTOR to stop the WORK, or any portion thereof, until the

cause for such order has been eliminated; however, this right of OWNER to stop the WORK shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any other party.

Correction or Removal of Defective WORK:

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

One Year Correction Period:

13.12 If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific Provision of the Contract Documents, any WORK is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER'S written instructions, either correct such defective WORK, or if it has been rejected by OWNER, remove it from the site and replace it with non-defective WORK. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective WORK corrected or the rejected WORK removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of ENGINEERS, architects, attorneys and other professionals) will be paid by CONTRACTOR. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion

of all WORK, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

Acceptance of Defective WORK:

13.13 If, instead of requiring correction or removal and replacement of defective WORK, OWNER (and, prior to ENGINEER'S recommendation of final payment, also ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall bear all direct, indirect and consequential costs attributable to OWNER'S evaluation of and determination to accept such defective WORK (such costs to be approved by ENGINEER as to reasonableness and to include but not be limited to fees and charges of ENGINEERS, architects, attorneys and other professionals). If any such acceptance occurs prior to ENGINEER'S recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the WORK; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

OWNER May correct Defective WORK:

13.14 If CONTRACTOR fails within a reasonable time after written notice of ENGINEER to proceed and to correct defective WORK or to remove and replace rejected WORK as required by ENGINEER in accordance with paragraph 13.11, or if CONTRACTOR fails to perform the WORK in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph OWNER shall proceed expeditiously. To the extent necessary to complete corrective and

remedial action, OWNER may exclude CONTRACTOR from all or part of the site, take possession of all or part of the WORK, and suspend CONTRACTOR'S services related thereto, take possession of CONTRACTOR'S tools, appliances, construction equipment and machinery at the site and incorporate in the WORK all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER'S representatives, agents and employees such access to the site as may be necessary to enable OWNER to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of OWNER in exercising such rights and remedies under this paragraph will be charged against CONTRACTOR in an amount approved as to reasonableness by ENGINEER, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the WORK; and OWNER shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, OWNER may make a claim therefor as provided in Article 11. Such direct, indirect and consequential costs will include but not be limited to fees and charges of ENGINEERS, architects, attorneys and other professionals, all court and arbitration costs and all costs of repair and replacement of WORK of others destroyed or damaged by correction, removal or replacement of CONTRACTOR'S defective WORK. CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in performance of the WORK attributable to the exercise by OWNER of OWNER'S rights and remedies hereunder.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

Schedule of Values:

14.1 The schedule of values established as provided in paragraph 2.9 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to

ENGINEER. Progress payments on account of Unit Price WORK will be based on the number of units completed.

Application for Progress Payment:

14.2 CONTRACTOR shall submit a monthly signed invoice to the ENGINEER for his review and subsequent payment by the County. Invoices shall be received no later than the 15th day of the month following the month that WORK was performed. Invoices shall indicate the value of WORK completed through the previous month and the amount of previous payments. The invoice amount shall be the total value completed through the previous month, less retainage, less the total amount previously paid. CONTRACTOR shall provide proof that all subcontractors and material suppliers have been paid.

The County shall make payment within thirty (30) days after receipt of the original signed invoice from the ENGINEER providing the above conditions are met. Invoices received after the 15th day of the month following the month WORK was performed, will be paid within forty-five (45) days after receipt of the original signed invoice from the ENGINEER provided that the above conditions are met. CONTRACTOR'S final invoice must be received by the County no later than thirty (30) days after the project completion date specified in the Agreement.

Payments will be sent to the designated address by U. S. Mail only; payments will not be hand delivered.

CONTRACTOR'S Warranty of Title:

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

Review of Applications for Progress Payment:

14.4 ENGINEER will, within five days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER, or return the Application to CONTRACTOR indicating in writing ENGINEER'S reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application. Ten days after presentation of the Application for Payment with ENGINEER'S recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.7) become due and when due will be paid by OWNER to CONTRACTOR.

14.5 ENGINEER'S recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER'S on-site observations of the WORK in progress as an experienced and qualified design professional and on ENGINEER'S review of the Application for Payment and the accompanying data and schedules that the WORK has progressed to the point indicated; that, to the best of ENGINEER'S knowledge, information and belief, the quality of the WORK is in accordance with the Contract Documents (subject to an evaluation of the WORK as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price WORK under paragraph 9.10, and to any other qualifications stated in the recommendation); and that CONTRACTOR is entitled to payment of the amount recommended. However, by recommending any such payment ENGINEER will not thereby be deemed to have represented that exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the WORK beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents or that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid

additionally by OWNER or OWNER to withhold payment to CONTRACTOR.

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

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

14.7.1 the WORK is defective, or completed WORK has been damaged requiring correction or replacement,

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

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

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

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

Substantial Completion:

14.8 When CONTRACTOR considers the entire WORK ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire WORK is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Within a reasonable time thereafter, OWNER, CONTRACTOR and ENGINEER shall make an inspection of the WORK to determine the status of completion. If ENGINEER does not consider the WORK substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers the WORK substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the WORK is not substantially complete, ENGINEER will within fourteen days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER'S objections, ENGINEER considers the WORK substantially complete, ENGINEER will within said fourteen days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, maintenance, heat, utilities, insurance and

warranties. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER prior to ENGINEER'S issuing the definitive certificate of Substantial Completion, ENGINEER'S aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

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

Partial Utilization:

14.10 Use by OWNER of any finished part of the WORK, which has specifically been identified in the Contract Documents, or which OWNER, ENGINEER and CONTRACTOR agree constitutes a separately functioning and usable part of the WORK that can be used by OWNER without significant interference with CONTRACTOR'S performance of the remainder of the WORK, may be accomplished prior to Substantial Completion of all the WORK subject to the following:

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

complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the WORK to be substantially complete, the provisions of paragraph 14.8 and 14.9 will apply with respect to certification of Substantial Completion of that part of the WORK and the division of responsibility in respect thereof and access thereto.

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

14.10.3 No occupancy or separate operation of part of the WORK will be accomplished prior to compliance with the requirements of paragraph 5.8 in respect of property insurance.

Final Inspection:

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

Final Application for Payment:

14.12 After CONTRACTOR has completed all such corrections to the satisfaction of ENGINEER and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in paragraph 6.19) and other documents - all as required by the Contract Documents, and after ENGINEER has indicated that the WORK is acceptable (subject to the provisions of paragraph 14.16), CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to OWNER) of all Liens arising out of or filed in connection with the WORK. In lieu thereof and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full; an affidavit of CONTRACTOR that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the WORK for which OWNER or OWNER'S property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment. If any Subcontractor or Supplier fails to furnish a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

Final Payment and Acceptance:

14.13 If, on the basis of ENGINEER'S observation of the WORK during construction and final inspection, and ENGINEER'S review of the final Application for Payment and accompanying documentation - all as required by the Contract Documents, ENGINEER is satisfied that the WORK has been completed and CONTRACTOR'S other obligations under the Contract Documents have been fulfilled, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER'S recommendation of payment and present the Application to OWNER for payment. Thereupon ENGINEER will give written notice to OWNER and CONTRACTOR that the WORK is acceptable subject to the provisions of paragraph 14.16. Otherwise, ENGINEER will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application. Thirty days after presentation to OWNER of the Application and accompanying documentation, in appropriate form and substance, and with ENGINEER'S recommendation and notice of acceptability, the amount recommended by ENGINEER will become due and will be paid by OWNER to CONTRACTOR.

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

the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

CONTRACTOR'S Continuing Obligation:

14.15 CONTRACTOR'S obligation to perform and complete the WORK in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by ENGINEER, nor the issuance of a certificate of Substantial Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the WORK or any part thereof by OWNER, nor any pact of acceptance by OWNER nor any failure to do so, nor any review of a Shop Drawing or sample submission, nor the issuance of a notice of acceptability by ENGINEER pursuant to paragraph 14.13, nor any correction of defective WORK by OWNER will constitute an acceptance of WORK not in accordance with the Contract Documents or a release of CONTRACTOR'S obligation to perform the WORK in accordance with the Contract Documents (except as provided in paragraph 14.16).

Waiver of Claims:

14.16 The making and acceptance of final payment will constitute:

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

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

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

OWNER May Suspend WORK:

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

OWNER May Terminate:

15.2 See Construction Agreement, Section 10 "Termination".

ARTICLE 16 - ARBITRATION

Section 16.1 is Deleted

Section 16.2 is Deleted

Section 16.3 is Deleted

Section 16.4 is Deleted

Section 16.5 is Deleted

ARTICLE 17 - MISCELLANEOUS

Giving Notice:

17.1 Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered as stipulated in Section 11E of the Construction Agreement.

Computation of Time:

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

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

General:

17.3 Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others

for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 17.3 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

17.4 The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR by paragraphs 6.30, 13.1, 13.13, 13.14, 14.3 and 15.2 and all of the rights and remedies available to OWNER and ENGINEER thereunder, are in addition, to and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply. All representations, warranties and guarantees made in the Contract Documents will survive final payment and termination or completion of the Agreement.

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TANNERS BRIDGE ROAD LAS MECHANICAL SCREENING FACILITIES (SS016)

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SECTION X SUPPLEMENTARY GENERAL CONDITIONS

1. **THE GENERAL CONDITIONS:** The General Conditions shall apply to all work in the Contract Documents, except as otherwise specified in the Supplementary General Conditions. Requirements of the Supplementary General Conditions supersede those of the General Conditions.
2. **COMMENCEMENT AND COMPLETION OF WORK:** The Contractor shall commence the Work on the date indicated in the Notice to Proceed and shall diligently prosecute said Work so as to complete the entire project and place it in use within **100** calendar days. Beneficial occupancy shall be obtained in **100** calendar days.
3. **SCOPE OF THE WORK:** The Work includes the furnishing of all necessary machinery, equipment, tools, labor and other construction means, and all materials (except where otherwise noted) required to perform the Work and Specifications and including the placing of the Work into satisfactory operation.
4. **LOCATION:** The work under this Contract will be located in Barrow County, Georgia as shown on the Drawings.
5. **EXTENSION OF TIME AND FAILURE TO COMPLETE ON TIME:** Any and all extensions of time shall be in accordance with the General Conditions, except as otherwise hereinafter provided.

Failure to complete the Project on or before the stipulated completion date will result in the assessment of liquidated damages in the amount of \$250.00 per calendar day.

6. **CONSTRUCTION DRAWINGS:** The Work shall conform to the following construction drawings:

<u>Sheet No.</u>	<u>Title</u>
COVER	TANNERS BRIDGE ROAD LAS MECHANICAL SCREENING FACILITIES
2	GENERAL NOTES AND LEGEND
3	SITE PLAN
4	HEADWORKS STRUCTURE
5	CONSTRUCTION AND EROSION CONTROL DETAILS
E-1	ELECTRICAL ONE LINE DIAGRAM AND SCHEMATIC
E-2	ELECTRICAL SITE PLAN

MANDATORY BID ALTERNATE "A"

EX-1	FORCE MAIN AND INFLUENT FLOW METER INSTALLATION
EX-2	FORCE MAIN AND INFLENT FLOW METER SECTION
EX-2.1	8' DIAMETER MANHOLE DETAILS
EX-3	ELECTRICAL SITE PLAN
EX-4	FLOW METER DETAILS

7. REPORTS AND DRAWINGS USED BY THE ENGINEER: In the preparation of Drawings and Specifications, ENGINEER has relied upon:
- a. Barrow County GIS digital records, "Soil Survey of Barrow, Hall, and Jackson Counties, Georgia" prepared by the United States Department of Agriculture, Soil Conservation Service.
8. SANITARY CONVENIENCES: The CONTRACTOR shall provide adequate sanitary conveniences for use of those employed on the work and their use shall be strictly enforced. Such conveniences shall be made available when the first employees arrive on the site and shall be removed after the departure of the last employees from the job.
9. ENVIRONMENTAL IMPACT: The CONTRACTOR shall conduct all operations so as to minimize, to the greatest extent possible, adverse environmental impact.
- a. Noise: All equipment and machinery shall be provided with exhaust mufflers maintained in good working order so as to reduce operating noise to minimum levels.
 - b. Dust/Smoke: All equipment movements shall be accompanied by a minimum of dust. Traveled surfaces and earthwork shall be maintained in a moist condition to avoid the generation of dust or the airborne movement of particulate matter under all prevailing atmospheric conditions.

Burning operations will be conducted only with written permission of the OWNER and/or appropriate regulatory agency. The CONTRACTOR shall be responsible for obtaining all permits and comply with all codes, ordinances and regulations pertaining to the burning.
 - c. Traffic: Trucks shall be routed over roads which will result in the least effect on traffic and nuisance to the public. All material shall be loaded in a manner which will preclude the loss of any portion of the load in transit, including covering, if necessary.
 - d. Sedimentation: All points of concentrated runoff from rainfall shall be visually monitored to determine that no eroded material from the construction site is being deposited offsite. Measures shall be taken to promptly eliminate such a deposition if occurring, including the installation of detention basins.
10. CONSTRUCTION STAKEOUT: The OWNER will provide benchmarks and baselines for horizontal and vertical control at the site of the work.
11. UTILITIES: Utilities such as sewer, water and electric lines encountered in the work shall be protected from injury and maintained in service until moved or replaced as required under this Contract or by others as the case may be, or abandoned as may be necessary for the proper construction and use of the new work.

12. ADJUSTMENT OF DISCREPANCIES: In all cases of discrepancies between the various dimensions and details shown on drawings, or between the drawings and these specifications, the more expensive construction shall be estimated before construction is started, the matter shall be submitted to the ENGINEER for clarification. Without such a decision, discrepancies shall be adjusted by the CONTRACTOR at his own risk and in settlement of any complications arising from such adjustment, the CONTRACTOR shall bear all of the extra expense involved.
13. EQUIPMENT ADJUSTMENT AND CALIBRATION: All mechanical and electrical equipment, including related control systems, shall be subjected to preliminary operation and testing by the Contractor before the individual facilities and systems are put into operation. Tests shall be made to determine whether the equipment has been properly assembled, aligned, adjusted, wired and connected. Any changes, adjustments, or replacement of equipment which are due to errors or omissions on the part of the CONTRACTOR or which may be otherwise necessary to comply with the requirements of this Contract, shall be done without additional cost to the OWNER. Upon completion of the checking and adjustment, the CONTRACTOR shall demonstrate that each separate piece of equipment in each system of related items of mechanical equipment and the related instrumentation and control equipment operate in accordance with the requirements of the Contract Documents. Where no specific performance requirements are stated, the test shall show that the equipment operates in accordance with normal application practice of the equipment. The demonstration test shall show that the equipment operates smoothly and without excessive noise or vibration, that the equipment is responsive to manual and automatic controls, that control and protective devices are properly set, that the equipment will run continuously when continuous operation is intended, and that the equipment will run on a controlled or intermittent basis when this operation is intended. The demonstration test for each piece of equipment shall include check out from each remote control point. All alarm systems and safety lockout systems shall also be demonstrated for proper function along with all process instrumentation and controls.

The demonstration test shall be arranged by the CONTRACTOR who shall notify the ENGINEER not less than 3 days in advance of the date of the test. The CONTRACTOR shall provide personnel from the various trades involved to operate and demonstrate the equipment.

14. SYSTEM START-UP: The CONTRACTOR shall place the various items of equipment into operation, and shall notify the ENGINEER at least 3 days in advance of the date of start-up.

Schedule for such start-up of the majority of the equipment and pumping systems will occur during the duration of the Contract Time and prior to final completion and acceptance of the overall project. After satisfactory start-up of these individual systems, including all of the related equipment, they will remain in continuous or intermittent operation as required.

All equipment and accessories shall be adjusted and calibrated prior to any start-up as specified under these Supplementary General Conditions. Any equipment placed into temporary operation prior to final completion of the total project shall be re-adjusted and/or calibrated.

The CONTRACTOR shall supervise, control, and be responsible for the operation and maintenance of the new equipment and/or system during a period of at least 10 days after each individual item is placed into operation. The CONTRACTOR shall furnish an adequate number of competent start-up personnel to provide supervision during these phases. The CONTRACTOR shall remain responsible for making any required changes, repairs or replacements to the new installation during this period.

15. INSTRUCTION OF OWNER'S EMPLOYEES: The CONTRACTOR shall provide competent personnel who fully understand the operation of the equipment to instruct the OWNER'S employees in the operation and maintenance of each item and system. Such instruction shall take place prior to acceptance of the installation by the OWNER at such a time or times that are acceptable to the OWNER. The CONTRACTOR shall include the cost of this training in the bid price for this Contract. Training shall be of the on-the-job type, and shall cover all areas of operation and equipment maintenance.

Scheduling of instruction of the OWNER'S employees will be mutually agreed upon between the OWNER, CONTRACTOR and the ENGINEER.

16. OPERATING INSTRUCTION MANUALS: The CONTRACTOR shall prepare and submit 6 copies of a complete set of operating instructions for the overall project and covering all equipment and systems furnished. Operating instructions shall be prepared specifically for each system installed and shall consider the specific equipment and controls included. Operating instructions shall be complete for each separate system, and shall detail start and stop procedures and shall explain all safety devices and detail procedures and precautions for restarting after failure or safety lockout situations.
17. MAINTENANCE INSTRUCTION MANUALS: The CONTRACTOR shall prepare and submit 6 copies of a complete set of maintenance instruction manuals for the overall project and covering all equipment furnished. Manuals shall include complete parts listed for all equipment and recommended spare parts. Manuals shall be prepared specifically for the particular equipment furnished and shall consider the specific operation of this equipment in the particular process system involved. Complete lubrication requirements shall be listed, including recommended lubricant and lubricating intervals or schedule.
18. MAINTENANCE DURING CONSTRUCTION: The CONTRACTOR shall maintain the Work from the beginning of construction operations until final acceptance. This maintenance shall constitute continuous and effective work prosecuted day by day with adequate equipment and forces to the end that the site and structures thereon are kept in satisfactory condition at all times, including satisfactory signing or marking as appropriate and control of traffic where required by use of traffic control devices as required by the State in which this project is located.

Upon completion of the Work, the CONTRACTOR shall remove all construction signs and barriers before final acceptance.

While undergoing improvements, the roads shall be kept open to all traffic by the CONTRACTOR. The CONTRACTOR shall keep the portion of the site being used by public traffic, whether it be through or local traffic, in such condition that traffic will be adequately accommodated. The CONTRACTOR shall bear all cost of signs and markings as required and other maintenance work during construction and before the Work is accepted and of constructing and maintaining such approaches, crossings, intersections, and other features as may be necessary without direct compensation.

19. BARRICADES, DANGER, WARNING & DETOUR SIGNS: The CONTRACTOR shall provide, erect, and maintain all necessary barricades, suitable and sufficient lights, danger signals, signs and other traffic control devices, and shall take all necessary precautions for the protection of the work and safety of the public. Highways and streets closed to traffic shall be protected by effective barricades, and obstructions shall be lighted during hours of darkness. Suitable warning signs shall be provided to properly control and direct traffic.

The CONTRACTOR shall furnish, install, and maintain all necessary barricades, warning signs, and other protection devices in accordance with the State requirements in which the project is located. Temporary signs may be reused, provided they are in good condition and legible. All protective devices shall be kept in a good, legible condition while in use.

As soon as construction advances to the extent that temporary barricades, and signs are no longer needed to inform the traveling public, such signs shall be promptly removed.

The cost of furnishing, erecting, maintaining, and removing protective devices will not be paid for as a separate Bid Item. Where the CONTRACTOR is required to perform any of these functions, the cost thereof shall be included in the overall Bid submitted. Ownership of the temporary warning devices shall remain with the CONTRACTOR.

20. HIGH VOLTAGE ACT: The CONTRACTOR acknowledges the requirement of the State High Voltage Act by execution of this Contract.
21. ACCESS FOR INSPECTION: Access for inspection shall be provided for representatives of the Georgia Department of Natural Resources.
22. INSURANCE: See Section K of the Agreement for Insurance Requirements.
23. Paragraphs 5.6 and 5.7 of the General Conditions and references thereto shall be non-applicable to this contract.
24. Subcontracts: The Contractor shall not contract with any person or entity declared ineligible under Federal laws or regulations from participating in Federally assisted construction projects or to whom the Owner or the Engineer has made reasonable objection. The Contractor shall not be required to contract with anyone to whom he has a reasonable objection. The Contractor shall submit a list of his subcontractors within seven (7) days after Notice of Award.

25. Safety and Protection: Attention is invited to the regulations issued by the Secretary of Labor pursuant to Section 107 of the contract Work Hours and Safety Standards Act (40 U.S.C. 333) entitled "Safety and Health Regulations for Construction" (29 CFR Part 1926). The contractor shall be required to comply with those regulations to the extent that any resulting Contract involves construction.

26. RETAINAGE OF CONTRACTOR'S PAYMENT: The retainage shall be an amount equal to 10% of Contractor's partial pay estimate until 50% of the work has been completed. At 50% completion, further partial payments shall be made in full to the CONTRACTOR and no additional amounts may be retained unless the ENGINEER certifies that the job is not proceeding satisfactorily, but amounts previously retained shall not be paid to the CONTRACTOR. At 50% completion or any time thereafter when the progress of the WORK is not satisfactory, additional amounts may be retained but in no event shall the total retainage be more than 20% of the value of the work completed. Upon substantial completion of the work, any amount retained may be paid to the CONTRACTOR. When the WORK has been substantially completed except for WORK which cannot be completed because of weather conditions, lack of materials or other reasons which in the judgement of the OWNER are valid reasons for non-completion, the OWNER may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the WORK still to be completed. Partial pay estimates may include stored materials. Contractor must submit invoices and all materials must be located at the site of the work. Retainage will not be held on stored materials.

27. Siltation and soil erosion must be minimized during construction and shall be in accordance with the Rules & Regulations of the State of Georgia.

28. Restore disturbed areas to original or better conditions.

29. USE OF CHEMICALS: All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide disinfectant, polymer, reactant or other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in conformance with the instructions provided by the chemical manufacturer.

30. COORDINATION BETWEEN CONTRACTORS: The General Contractor for this project shall be responsible for coordinating related work items with the subcontractors.

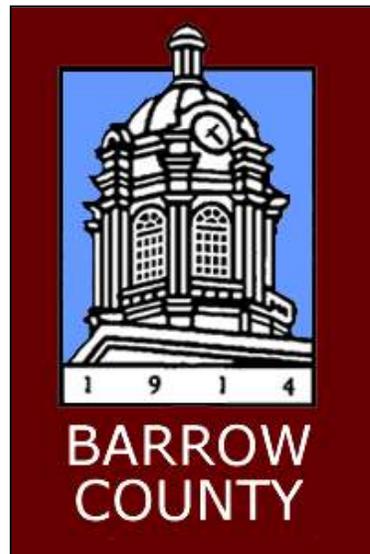
END OF SECTION

SECTION XI ATTACHMENTS

- Volume I- General Requirements For Wastewater Systems
- Volume II- Standard Specifications For Wastewater System Construction
- Additional Technical Specifications
- Construction Plans (Project # SS016)
- Mandatory Bid Alternate "A" Exhibits
- Ethics Ordinance

VOLUME I

**GENERAL REQUIREMENTS
FOR
WASTEWATER SYSTEMS**



For:

**BARROW COUNTY
BOARD OF COMMISSIONERS**

30 North Broad Street
Winder, Georgia 30680

Prepared by:

HSF Engineering, Inc.

2910 Brookside Run
Snellville, Georgia 30078
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SECTION 1

POLICIES AND PROCEDURES

1.01 Scope and Intent

The intent of these Policies and Procedures is to establish minimum requirements and guidelines for sanitary sewer projects, including pumping stations and force mains, constructed in Barrow County. The procedures will apply to all sewer development and construction projects, both public and private, within the jurisdiction of Barrow County. The procedures shall also apply to all existing sanitary sewer facilities including septic tanks which are being upgraded or have failed and are being corrected, both public and private, within the jurisdiction of Barrow County. Before any proposed project can be considered or reviewed for approval, verification must be provided to ensure the project is consistent with the current Barrow County Service Delivery Strategy.

1.02 Purpose

The Barrow County Board of County Commissioners recognizes that water is a natural resource of limited supply and wastewater treatment and disposal is a necessity for public health. Thus, the water supply must be regulated and controlled and subjected only to reasonable and beneficial use to assure an adequate wastewater treatment capacity for all members of the public served by Barrow County Utility System. Therefore, the disposal service by the Barrow County Utility System to any development is subject to regulation, prohibition, limitation and restriction by local, state and federal governmental agencies, including the board of health, as well as Barrow County.

1.03 Definitions

- A. County: Board of County Commissioners, Barrow County, Georgia or its authorized representative.
- B. County Utility System: The Barrow County public wastewater system, including sanitary sewers, pump stations and treatment facilities.
- C. Developer or Owner: Any person, firm, corporation, association or partnership or any agent thereof who undertakes or proposes to undertake the development of land so as to constitute a residential subdivision, apartment complex, condominium, or commercial/industrial/institutional establishment.

- D. EPD: Environmental Protection Division of the Georgia Department of Natural Resources.

1.04 Variances

Under special conditions with specific applications, the procedures and policies may be altered to meet certain conditions that are beyond the control of the Developer, provided such alterations or deviations are acceptable to the County. Final decisions concerning such alterations shall be made by the Board of County Commissioners or its designee.

1.05 Pre-Design Conference

It is recommended that each Developer or owner initiate a pre-design conference between himself, his engineer, and the Barrow County Sewer System Director or his designated representative.

1.06 Trust Indenture

- A. To assure continuity of maintenance and operation of a non-governmentally owned community sewerage system, the Developer shall file a trust indenture or other legal contract or agreement with the Georgia State Department of Natural Resources (DNR), Environmental Protection Division (EPD) for their review and approval. For new or proposed systems, the legal document shall be submitted with the plans and specifications in accordance with DNR Rules and Regulations for Water Quality Control, Rule 391-3-6-.06(13). The County's participation in and supporting of any non-county owned utility system as trustee, is conditioned on:
1. The proposed sewer system being planned and designed in accordance with these county standards and specifications.
 2. A trust deed or other legal contract being prepared by the Developer(s) in form and content acceptable to the County.
 3. All costs associated with preparation of plans and specifications (including reviews by the County or its designated representative) and the trust deed or legal contract, being borne by the Developer.

1.07 Connection to Existing System

- A. New connections to the existing County Utility System are subject to all county standards, specifications, codes, and ordinances as they pertain to sewer systems and/or facilities.

- B. No private pump station, force mains or sewers will be allowed to connect to the County Utility system. Service laterals and connections serving only one customer (as defined in Sections 3.06, 3.07 & 3.08) are not considered private sewers and are the customer's responsibility for maintenance.
- C. Under no circumstances shall any storm water facilities be connected to the County Utility System.

1.08 Existing Subdivision Regulations

The requirements of these Policies and Procedures for sewer systems shall be in addition to the requirements of the Barrow County Unified Development Code, dated May 4, 2005, and all amendments thereto.

1.09 Conveyance of Extension to County Utility System

- A. The Developer shall construct and convey to the County, free and clear of all encumbrances and at no cost to the County, the extension to the County Utility System and the complete wastewater system on the Developer's property.
- B. Developer shall submit to the County, engineering plans based on the County Standard Sewer Specifications for the proposed extension prepared by the Developer's engineer, which shall be approved in writing by the County prior to any construction work being performed.
- C. Following conveyance by the Developer, the extension and any additions, repairs and replacements thereto shall at all times remain the sole, complete and exclusive property of and under the control of the County, and the Developer shall have no right or claim in or to the Developer's extension; provided however, that the extension shall provide required sewer service to the development. Any excess capacity may be utilized by the County for uses outside the development area.

1.10 Fees

- A. Sewer Capacity fee: Sewer capacity fee shall be charged for each establishment, structure and use added to the County Utility System. The Developer and/or builder will pay the current Sewer Capacity Fee presently charged for connections to the County Utility System as stipulated in the pertinent county code establishing rates, charges and regulations for wastewater systems.

- B. Sewer Plan Review and Inspection Fees: The Developer shall pay an inspection and review fee in order to defray all actual costs to the County, including any attorneys' fees, of:
 - 1. Conducting the review of the engineering plans and specifications;
 - 2. Conducting the inspection and testing of the installation of the water and/or sewer extension; and
 - 3. All other administrative costs incident to either accepting the extension into the County Utility System or becoming trustee of a non-county-owned system.
- C. Fees shall be paid in full prior to receiving County approval of plans.

1.11 Grant of Easement Rights

- A. Developer shall grant to the County, its successors and assigns, the exclusive perpetual right, privilege and easement to construct, reconstruct, operate, maintain, repair, replace, improve, alter, remove, relocate and inspect sewage collection mains, sewage pumping stations, sewage treatment plants, pipelines, lateral lines, valves, connections and appurtenant equipment over, across and under the strip of land wherein system lies on the Developer's property, together with the right of ingress and egress to each of the building sites on Developer's property which are to be served by the County Utility System. The easement rights granted with respect to public places shall be subject to the authority of the public authority having jurisdiction over such public places.
- B. Prior to the County Utility System providing service to the development, the Developer shall execute a grant or grants of easement, in recordable form to be approved by the County, specifically granting to the County the above rights necessary, in the discretion of the County to provide sewer utility service to the Developer's property.
- C. Nothing shall prevent Developer or any subsequent owner of Developer's property from exercising itself or granting exclusive or non-exclusive rights, privileges and/or easements to any other parties for the furnishing of utility services other than sewerage, provided that the County's use, occupancy and enjoyment of its easements are not unreasonably interfered with. Use of the easement for any purpose other than sewer will require approval by the County.
- D. The County shall not be obligated to furnish any sewer service to any building which may be built on Developer's property to which it does not have access.

1.12 Developer's Right to Connect

Provided that the Developer has complied with the terms of these Policies and Procedures and provided that the Developer's extension is installed with the approval of the County and in compliance with the requirements of all public, governmental or other agencies having supervision, regulation, direction or control of such sewage utility systems, the County shall allow the Developer or its successor-in-title to connect the Developer's extension into the County Utility System.

1.13 Underground Utility Contractor

- A. All extensions and additions to the County Utility System shall be performed by a Georgia Licensed Utility Contractor, or by the County's own work force.
- B. The County reserves the right to approve in writing the underground utility contractor and/or his subcontractor installing utility lines for the Developer under the terms of these Policies and Procedures.

1.14 Developer's Plans

- A. All engineering plans prepared by Developer's engineer, as provided in Article 1.09 above, shall be reviewed and approved by the County prior to Developer submitting plans and specifications to any other governmental agencies. The Developer's engineering design and plans, shall conform to the applicable standards and specifications and Unified Development Code including applicable erosion and sedimentation control requirements of Barrow County.
- B. As a minimum for the following types of facilities, include the indicated information:
 - 1. Gravity Sewers
 - a. Plan and Profile at a scale no smaller than 1 inch = 100 feet horizontal and 1 inch = 10 feet vertical.
 - b. Stations on manholes and the length of pipe segments between manholes.
 - c. Angles between manholes and state plane coordinates of manholes.
 - 2. Force Mains
 - a. Plan and Profile at a scale no smaller than 1 inch = 100 feet horizontal and 1 inch = 10 feet vertical.
 - b. Locations of air release valves.
 - 3. Pump Stations
 - a. Site Plan at scale no smaller than 1 inch = 20 feet.

- b. Location of wetwell, valve vault, by-pass valve, access road, parking area, and fence.
- C. Additional requirements of EPD are included in Appendix A of these General Requirements for Wastewater Systems.

1.15 Installation and Inspection

The Developer's sewer system shall be constructed in accordance with the engineering plans approved by the County. The County shall have the right, but not the obligation, to make inspections as installation progresses. The County shall not accept Developer's sewer system and will issue no certifications until all manhole covers are exposed at proper finish grade. Field revisions to approved plans must be submitted in writing with documentation. The revisions must be reviewed and approved by the Sewer Department Director prior to construction of requested revision.

1.16 Test of Developer's System

The County will not accept Developer's sewer system until new facilities have passed all pre-determined tests as stipulated in Section 8. All required tests must be arranged by the Developer and witnessed by the County, or its representative, to determine whether the facilities are constructed in accordance with the approved engineering plans and Standard County Sewer Specifications. Developer will pay all costs of locating leaks and their repairs deemed necessary by the County as a result of said tests.

1.17 Conditions Precedent to System Usage

- A. Prior to the County accepting the sewer system, Developer shall comply with all terms of these Policies and Procedures and shall:
 - 1. Provide to the County releases of liens received by the Developer, or its agent, in connection with the construction of the facilities.
 - 2. Furnish the County with one set of Record Drawings as specified in Article 1.33.
 - 3. Furnish, in form and substance acceptable to the County, all of the following relating to the facilities:
 - a. All permits and governmental approvals obtained by the Developer, its contractors and agents.

- b. Certification by Developer's engineer that the facilities have been constructed substantially in accordance with approved plans and specifications.

1.18 Right of Termination of Service

The County shall refuse to provide service and reserves the right to terminate service to any lot or building within Developer's property, in the event Developer defaults or fails to comply with any of the terms and conditions of these Policies and Procedures in a timely manner and fails to cure such default or fails to comply within 30 consecutive calendar days following the receipt by Developer of County's notice of such default or failure to comply.

1.19 Limitation of Liability of County

The County shall not be liable or responsible to the Developer as a result of injury to property or person, which injury was created by acts of God, strikes, lockouts, or other industrial disturbances, acts of public enemy, wars, blockades, riots, acts of armed forces, epidemics, delays by carriers, inability to obtain materials or right-of-way on reasonable terms, acts of public authorities, acts of vandals or other third parties, or any other causes whether or not of the same kind enumerated herein. In no event shall the County be liable to Developer or any customer for any consequential, incidental or punitive damages as a result of injury to property or person, regardless of whether said injury was the result of acts of or within the control of the County.

1.20 Approval by Governmental Agencies

The County's obligations are contingent upon Developer obtaining all necessary approvals for sewer system from all concerned governmental agencies. Developer assumes the risk of loss as a result of the denial or withdrawal of the approval of any concerned governmental agency, or caused by an act of any governmental agency which affects the ability of the County to provide sewer service to Developer not within the sole control of the County and which, by exercise of due diligence, it is unable to overcome.

1.21 No Prohibition of Further Extension

These Policies and Procedures shall not prohibit or prevent the County from extending the County Utility System in or to other areas to serve other Developers or customers, so long as extensions and the furnishing of services do not interfere with the furnishing of the services to the Developer's establishment.

1.22 Final Acceptance by County

Final acceptance by the County of the completed sewer system shall occur at such time as Developer has met all of the terms and conditions of these Policies and Procedures, all engineering tests and evaluations have been completed and approved by the County.

1.23 Warranty and Security

- A. Developer shall warrant its extension and hold County harmless against all costs, expenses and losses, including, without limitation, incidental and consequential damages, resulting from any defects in the Developer's extension, including, without limitation, defects in material and workmanship, which are discovered or arise within a period of one year following the date of the final acceptance.
- B. As security for Developer's performance of this representation and warranty, simultaneously with the conveyance of the Developer's extension, Developer shall deliver to the County an executed contract bond in form and substance satisfactory to the County in the amount of 50 percent of total cost of the sewer construction. The contract bond shall have as the surety thereon such surety company, acceptable to the County, as is authorized to write bonds of such character and amount under the laws of the State of Georgia, is listed in the current edition of the U.S. Treasury Circular 570, and has an underwriting limitation in said document in excess of the required bond amount. The attorney-in-fact, or other officer who signs a contract bond for a surety company, must file with such bond a certified copy of his power of attorney authorizing him to do so.
- C. Subject to the approval of the County, the Developer may elect to deliver to the County a contract bond in compliance with all requirements herein and in a form acceptable to the County from the Developer's contractors as the principal with the Developer and County as co-obligees.
- D. The contract bond shall remain in force for one year following the date of final acceptance by the County. Should the Developer fail to make or commence timely repairs or replacements of any defects in the Developer's extension discovered or arising within said one year period, the Developer or his surety shall be liable to the County for all costs arising therefrom.

1.24 Developer's Liability for Damage

Developer shall be responsible for, and make any repairs or replacement required as the result of, any breakage vandalism or other damage caused to his extension until final acceptance by the County. After the final acceptance the Developer shall indemnify and hold County harmless from the cost of any repairs for any breakage or other damage to his extension from time of completion of Developer's extension until completion of all buildings and houses, roads, paving, drainage, and other construction on Developer's property necessary to complete the development. If, within 10 days of the receipt of County notice of such breakage or other damage, Developer fails to make timely repairs and corrections, the County shall have the option to make such repairs or replacements at the Developer's cost.

1.25 Limited Reservation of Treatment Capacity

The reservation of sewage treatment capacity will be limited to the actual number of equivalent residential units (ERU's) committed by the County to the development pursuant to preconstruction approval of the sewage system facilities.

1.26 Period of Construction

Developer must begin construction of sewer facilities within 180 consecutive calendar days from the date of final County approval of drawings, and shall not cease for a continuing period of 180 consecutive calendar days or until final completion and acceptance of the constructed facilities whichever is sooner. Should the Developer not strictly adhere to these time frames, then any obligations or duties of the County shall be null and void.

1.27 Modification of Development Plans

Should the Developer modify his development plans which would require greater sewage flows, or additional sewage facilities than the sewage service demands designed and approved under the engineering plans and County Standard Specifications, then Developer shall enter into a new agreement with the County providing for the construction of such additional sewer facilities meeting all County and governmental design requirements and shall pay all additional contributions and Fees as may be required.

1.28 Notice of Connection to County Utility System

Developer shall deliver to the County written notice that he will be connecting the sewer facilities to the County Utility System no less than 24 hours prior to said connection to allow time for County inspection. If Developer fails to provide timely written notice, the County may require Developer to uncover and expose connection for inspection, at the sole cost of Developer.

1.29 Interruption of Facility Operations

- A. The Developer shall provide the County with written notice at least five days prior to any proposed 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 equipment and operations to be affected; and all other information the County may require. The Developer shall provide all equipment, piping, auxiliary power or other means necessary to sustain facility operations or function for the planned interruptions.
- B. The County must approve all proposed interruptions in facility operations. Such approval will be provided by the County to the Developer in writing.
- C. The Developer shall conduct operations in a manner and sequence which will provide for the continued transportation of wastewater flows during construction of the Developer's project. The Developer shall take all actions required to prevent discharge of sewer flow from the system to the ground or stream. Any construction actions that impede or interrupt flow shall be carefully executed and monitored to prevent surcharging and overflow.
- D. Any damages resulting from surcharging overflow or back-up caused by the Developer's operations shall be the Developer's responsibility. Fines charged the County for overflows caused by the Developer shall be paid for by the Developer along with other damages resulting from the overflow and other damages.

1.30 Connection of Buildings

The Developer shall at his sole cost and expense connect the private property sewer pipes of each dwelling or other building constructed on Developer's property to the sewer laterals of Developer's extension as reflected in plans and specifications approved by the County.

1.31 Application for Service

Developer, his successors, or the occupant(s) of the Developer's property, shall make written application to the County for the opening of account(s) for service. Application is to be made only after the payment of all sewer unit connection fees presently being charged by the County. At the time of making application for service, the applicant shall pay all service charges set forth in the current county code(s) establishing rates, charges and regulations pertaining to the County sewer system.

1.32 Notice of Transfer of Developer's Property

Developer agrees to provide proper written notice to County of the actual date of the legal transfer of sewer services from Developer to any third party. Developer shall remain responsible for all costs and expenses, including utility bills, which arise as a result of Developer's failure to notify or improper notification to the County.

1.33 Record Drawings and Video Requirements

- A. Record Drawings shall be submitted in the following format:
 - 1. Two sets of photo copy prints, and
 - 2. Digital plans in AutoCad *DWG* format and pdf format.
- B. Record Drawings shall be reproducible, shall have title block indicating that the drawings are Record Drawings, the name of the company preparing the Record Drawings, and the date the Record Drawings were prepared.
- C. Legibly mark drawings to record actual construction, including:
 - 1. All Construction
 - a. Changes of dimension and detail.
 - b. Changes made by Requests for Information (RFI), field order, clarification memorandums or by change order.
 - c. Details not on original Drawings.
 - d. Dimensions to each lateral connection from the downstream manhole.
 - 2. Underground Utilities
 - a. For sewers, the Record Drawings shall include the horizontal angle and distance between manhole covers, the depth of each manhole and invert in and invert out elevations.
 - b. For force mains, the profile of the top of the pipe shall be provided. Elevations, not depths, shall be provided at a minimum 100-foot interval

and at all bends, high points, low points, air valves, and where elevations are called out on the Drawings.

D. Precision

1. Unless noted otherwise, Record Drawings shall provide horizontal dimensions, distances and coordinates to the nearest 0.1 foot.
2. Unless noted otherwise, Record Drawings shall provide elevations to the nearest 0.01 foot for all pertinent items constructed by the Contractor. The Contractor shall employ a currently registered surveyor to prepare the Record Drawings from a post-construction, field run survey. For gravity sewers, the Record Drawings shall provide elevations to the nearest 0.01 foot for all manhole inverts, manhole frames and other pertinent items constructed by the Contractor. The Record Drawings shall provide dimensions, distances, and coordinates to the nearest 0.01 foot and horizontal angles to the nearest 10 seconds.
3. The cover of the Record Drawings shall include the following information:
 - a. Name and license number of the Georgia Utility Contractor.
 - b. Name of supplier and manufacturer of pipe.
 - c. Name of manufacturer of precast concrete manholes.
 - d. Name of Surveyor

E. Video Submittals

1. An electronic copy of the inspection video must be provided to the County before the sewer system can be accepted by the County.
2. The video shall record the footage as the camera progresses through the sewer pipe. The location of each lateral shall clearly be shown on the video by both lot number and linear footage from the manhole.
3. A field report of the video inspection must be submitted to County and shall include the following:
 - a. A diagram for each gravity sewer segment between manholes on a separate 8 ½ x 11 sheet.
 - a. The direction of flow for that segment of pipe.
 - b. The linear footage to each sewer lateral as measured from the same referenced manhole.
 - c. The linear footage to each sewer lateral as measured from the same referenced manhole.

END OF SECTION

SECTION 2

APPLICABLE WASTEWATER STANDARDS

2.01 Applicable Standards

It is intended that the Developer and/or Owner be responsible for the design of an adequate wastewater system as necessary for the development. The methods of design and construction shall be covered by the applicable standards listed hereinafter. By reference, the standards are made part of these specifications and standards.

1. Georgia State Department of Natural Resources (DNR), Environmental Protection Division (EPD), Rules and Regulations for Water Quality Control, Chapter 391-3-6, latest effective date.
2. Water Environment Federation (WEF), Regulation of Sewer Use, WEF Manual of Practice No. 3, latest edition.
3. Recommended Standards for Wastewater Facilities, 1990 or later editions, Policies for the Review and Approval of Plans and Specifications for Wastewater Facilities, A report of the Committee of the Great Lakes-Upper Mississippi River Board of State Public Health and Environmental Managers, generally referred to as the "Ten (10) States Standards for Sewage Works".
4. Gravity Sanitary Sewer Design and Construction, American Society of Civil Engineers (ASCE) Manuals and Reports on Engineering Practice No. 60, Water Environment Federal (WEF) Manual of Practice No. FD-5, revised April 1982.
5. Criteria for Slaw Rate Land Treatment and Urban Water Reuse, State of Georgia Department of natural Resources, Environmental Protection Division, March, 1992.
6. Utility Accommodations Policy and Standards, Georgia Department of Transportation, Office of Utilities, latest edition.
7. Soils Survey of barrow County, Georgia, by the United States Department of Agriculture, Soil Conservation Service in cooperation with the University Of Georgia College Of Agriculture, Agriculture Experiment Stations.
8. American Water Works Association (AWWA) Standards, latest editions.
9. American National Standards Institute (ANSI) Standards, latest editions.
10. American Society for Testing and Materials (ASTM) Standards, latest editions.
11. Occupational Safety and Health Administration (OSHA) regulations, latest editions.
12. Georgia Department of Transportation (DOT) specifications and regulations, latest editions.

13. American Association of State Highway and Transportation Officials (AASHTO) specifications, latest editions.
14. American Society of Mechanical Engineers (ASME) standards, latest editions.
15. National Electrical Manufacturer's Association (NEMA) standards, latest editions.
16. American Concrete Institute (ACI) standards, latest editions.
17. American Welding Society (AWS) standards, latest editions.

END OF SECTION

SECTION 3

SANITARY SEWERAGE SYSTEM – DESIGN REQUIREMENTS

3.01 General

The Developer shall be responsible for the design of an adequate sewage collection system and/or treatment facilities where necessary. The methods of design and construction shall be in accordance with all county codes, accepted engineering practices, and this Section. When the owner or Developer of a parcel of land desires to connect to the County Utility System, it shall be his (their) responsibility to contact the County. The Developer is responsible for the coordination of connection to a privately owned system. Public systems shall be located entirely within County-owned property, rights-of-way or dedicated easements.

3.02 Design Flows

A. Average Residential Flow Rates, Single-Family and Multi-Family: In the absence of data to the contrary, the following shall be used:

1. 111 gallons per capita per day (gpcd)
2. 300 GPD/per connection

B. All Others: Actual flow or estimated for each individual case as approved by the County.

C. Design Wastewater Peak Flow Factors

The peak factor for all residential projects including pump stations shall be 2.50. Designer is to consult with the County for determination of the peak factor for all commercial projects on a case by case basis.

D. Design all sewers to carry peak design flow when flowing ½ full (no hydraulic head allowed.)

3.03 Design Period

A. Gravity Sewers: 25 years minimum, 50 years preferred.

B. Force Mains: 20 years.

C. Pumping Stations: 20 years.

D. Treatment Facilities: 20 years.

3.04 Hydraulic Design

- A. Mains, submains and lateral sewers, 8-inch pipe, minimum; actual as based on hydraulic computations.
- B. House service connection, 6-inch pipe, minimum. Where customer service line is 4", a "Fernco" coupling or "Harco" rigid coupling shall be used to connect the 6" stub to the 4" service. The maximum allowable length of a service connection is 250 linear feet (LF).
- C. When increasing size of gravity sewer piping, pipe crowns shall be matched at manholes.
- D. Force Main Manifolding: Force main shall not be manifolded with new or existing force mains, unless it is documented that:
 - 1. The effects on existing pump stations are minimal based on engineering analysis of the system, and
 - 2. The cost of the alternative is substantial.

3.05 Location

- A. Sewers: On centerline of street or easement.
- B. Force Mains Along Subdivision Streets: Outside of pavements in a 10 foot easement outside and adjacent to the right-of-way and on opposite side of street or easement from water main. (Along County or DOT roads, force main may be designed in right-of-way).
- C. Easements: Minimum 20-foot width for sewer or force main. Easements will be allowed only when there is no other way to service development. Wider easements may be required for sewers of greater depth.
- D. Pumping Stations: Located outside of street or easement right-of-way on a parcel of land no smaller than 35 x 50 feet.
- E. Pipeline Depth:
 - 1. Sewers shall be designed to meet the following depth requirements:
 - a. minimum four feet of cover, unless sewer is constructed with ductile iron pipe, whereby minimum cover shall be two feet;
 - b. top of pipe shall be two feet below any creek, stream or ditch when such is crossed;
 - c. top of pipe shall be two feet below adjacent creeks, streams and ditches; and

- d. such a depth as to allow service connections to be constructed at minimum 2.0 percent slope from sewer to probable house location on each lot to be served, and assuming service line is three feet deep at probable house location.
2. Force mains shall be designed and constructed with a minimum of three feet of cover

3.06 Service Connections

- A. All service connections shall be 6-inch minimum size with a separate service connection to each lot. The maximum allowable length for a residential service connection or commercial lateral is 250 LF.
- B. Wherever possible, services shall connect to the existing sewers at manholes instead of direct connections to the sewer pipe. Service connections are not permitted to directly penetrate 24-inch diameter or larger trunk sewers.
- C. Inline manhole service connections shall be limited to two, one from each side of the street. Invert of service connection shall be installed at an elevation not greater than two feet above the invert of the sewer main. A maximum of three may be installed in any terminal manhole, provided the crown of the service connection and lateral sewer line are at the same elevation.
- D. Vertical service connection risers are not permitted within street rights-of-way.
- E. Clean-outs are not permitted within street rights of way, except for service laterals; in such case the clean-out shall be located at the right-of-way line.

3.07 Force Main Service Connections to Gravity Sewer System

- A. A force main service connection to a gravity sewer system shall serve only one customer per pump station and service force main.
- B. Force main service connections shall be connected to the gravity sewer main by installing a wye connection so that the force main discharges into the main in the same direction as the gravity flow.

3.08 Force Main Service Connections to Force Main Sewer System

- A. Any proposed force main service connection to a force main sewer system shall be submitted to the County for review to determine the availability of capacity in the force main sewer system and also to determine if the connection is technically

feasible. The submittal must include the following before it will be reviewed by the County:

1. Design plans and specifications prepared and stamped by a Professional Engineer (P.E.) licensed and in good standing with the State of Georgia
 2. Pump curves and pump station technical specifications
 3. Force main material and specifications, such as DR classification, ASTM classifications and/or pressure classification
- B. A force main service connection to a force main sewer system shall serve only one customer per pump station and service force main. The minimum size force main shall be two (2) inches in diameter. Grinder pumps are required for any service force mains less than 4-inches in diameter.
- C. A gate valve shall be installed directly after the service connection, followed by a check valve rated at a minimum 200 psi.
- D. The check valve located within the County right-of-way shall be installed with a flange connection on each side of the check valve to allow for maintenance and replacement.
- E. All force main service connections are required to have a check valve installed directly after the pump connection to the force main service line. All force main service connections must meet the criteria of
- F. When connecting a force main service connection to a County owned HDPE force mains, all pipe, taps, valves and fittings located within public right-of-way are required to be HDPE material. All pipe, taps, valves and fittings shall be installed using butt-fused fittings, thermo-fused fittings/couplings, or flanged adapters. (Exception: Check valves shall be flange connections and can be made of PVC material)

3.09 Velocities

- A. Gravity Sewers: When flow is full or one-half full, minimum velocity shall be 2.0 feet per second; maximum velocity shall be 4.0 feet per second.
- B. Force Mains: minimum velocity shall be 2.0 feet per second; maximum velocity shall be 5.0 feet per second unless otherwise approved by the County.

3.10 Minimum Gravity Sewer Pipe Slopes

Diameter, Inches	Slopes, %
8	0.40
10	0.28
12	0.22
15	0.15
16	0.14
18	0.12
20	0.11
24	0.08

3.11 Sewer Structural Integrity

- A. In the locations where the gravity sanitary sewer may be exposed to non-routine installation conditions, the sewer shall be constructed using ductile iron pipe and not polyvinyl chloride pipe. These conditions include, but are not limited to:
1. Where depth of cover is less than four feet.
 2. Where depth of cover is greater than fourteen feet;
 3. Where sewer crosses over a storm drain pipe;
 4. Where sewer crosses under a creek or stream;
 5. Where sewer crosses over or under a water main;
 6. Other locations deemed necessary by the County.
- B. Where ductile iron pipe is used, the ductile iron pipe shall extend from manhole to manhole.

3.12 Manholes

- A. Location: Provide manholes at all changes in pipe grade, pipe size, alignment, intersections, and at the end of a pipe run.
- B. Spacing
1. Pipe 15-inches and Smaller: 400 feet maximum.
 2. Pipe 18 to 30-Inches: 500 feet maximum, except with approval, 600 feet.
- C. Inverts: a minimum 0.2 feet drop across manhole inverts is required
- D. Inside Drop Connections: Drop connections inside a manhole shall not exceed a height of two pipe diameters plus 12 inches or greater above the outgoing pipe. Construct inside drop connections of the same materials as the upstream sewer and in accordance with the details shown on the Drawings.

- E. Outside Drop Connections: Manholes requiring outside drop connections are shown on the Drawings. Outside drop connections are required for any drop exceeding a height of two pipe diameters plus 12 inches or greater above the outgoing pipe. Construct outside drop connections of the same materials as the upstream sewer and in accordance with the details shown on the Drawings.

3.13 Grease Traps

- A. Grease, oil, flammable liquid, and/or sand traps shall be provided at all vehicle service stations, commercial or industrial food-handling establishments, and at any other commercial or industrial establishment or institution at which such devices are necessary for the proper handling of liquid wastes containing grease, oil, flammable liquids, or sand.
- B. Such grease traps shall be of a type and size approved by the County and shall be located as to be readily and easily accessible for cleaning and inspection.
- C. Such grease traps shall be properly maintained by the sewer service customer. Maintenance shall include periodic removal of the contents of the grease trap with no reintroduction of any portion of the waste into the grease trap or introduction into a County's sewer system. The County may require grease trap maintenance based upon the observation of material build-up in the grease trap.
- D. Food handling establishments with no inside cooking may install an inside/under-the-counter type grease trap. All other establishments where grease traps are required shall install an outside grease trap with a capacity of at least 1,000 gallons.

3.14 Sewage Treatment Plants/Pumping Stations

Sewage treatment plants and pumping stations to be dedicated to the County will be considered on an individual basis. It is the Developer's responsibility to contact the County Utility System early in the planning stage for direction.

3.15 Record Drawings

When completed, Record Drawings shall be submitted for all systems for review and approval in AutoCad DWG format in the Georgia State Plane coordinates and hard copy.

3.16 Environmental Impacts

The Sanitary Sewerage System shall be designed to minimize the impact on the environment. This includes taking into consideration the proximity of impounded water, rivers, streams, wetlands, and the contours of the land, and the construction's impact on soil erosion and sedimentation. Soil erosion and sedimentation control devices shall be designed for a 25-year storm event.

END OF SECTION

SECTION 4

WASTEWATER PUMPING – DESIGN REQUIREMENTS

4.01 General

- A. Sewage pumping stations shall be Flygt duplex submersible type. Pumping station shall have an all weather access road located between the adjacent public road and the pumping station. The pump station road must meet the requirements of Article 4.05 below.
- B. The method of design and construction shall be in accordance with Standard Specifications for Wastewater System Construction and Article 4.02 below. The system shall be designed with considerations for future expansion and maintenance.

4.02 Pumping System Equipment and Appurtenances

- A. Pumps: FLYGT Duplex system mounted on guide rails.
- B. Emergency Pumping: Each pump station shall be designed with a “Godwin” permanently mounted bypass pump station with water proof acoustical cover and integral check valve on the discharge line. The pump shall be equal in capacity to one of the Flygt pumps located in the wet well. The battery shall be charged with a photovoltaic system. The by-pass pump station shall be equipped with floats separate from the Flygt pump station and shall contain a cell-phone based telemetry system separate from the Raco dialer. The cell phone telemetry system shall be powered from the bypass pump station battery.
- C. Controls: Controls shall meet the requirements of Standard Specifications for Wastewater System Construction.
- D. Air Release/Air and Vacuum Valves and Surge Relief Valves: Air Release/Air Vacuum Valves shall be installed at every high point along a force main. A high point is defined as a change in elevation consisting of 2 feet or more above the minimum hydraulic grade line. A Surge Relief Valve on the force main just downstream of the valve vault and discharging back to the wet well may be required for high head applications.
- E. Piping: Meet requirements of Standard Specifications for Wastewater System Construction.
- F. Valves: Located outside of wetwell in a vault with cover. Discharge line for each pump shall have a check valve and resilient seat gate valve with hand wheels.

- G. Ancillary components include:
1. Emergency by-pass pump
 2. "Multi- trobe" level sensor
 3. Wired for combustible gas detector
 4. Audible alarm with silencer
 5. Visual alarm
 6. Gauges on discharge piping
 7. Site light
 8. Elapsed time meter, each pump
 9. Washdown water service
 10. Telemetry

4.03 Wetwells and Valve Vaults

- A. Construction: Precast reinforced concrete in accordance with Standard Specifications for Wastewater System Construction.
- B. Access Cover: Aluminum, lockable access hatch with stainless steel hardware.
- C. Vent: Wetwells require a vent pipe.
- D. High Water Level: High water level within the wetwell shall be a minimum of five feet below the lowest floor slab of all houses, apartments, buildings, businesses, ect. Being served as well as five feet below wetwell top.

4.04 Security Fence

Provide chain link fence in accordance with Standard Specifications for Wastewater System Construction. Metal "No Trespassing" signs are required on all four sides of the pump station perimeter fence.

4.05 Pump Station Site

- A. Provide a driveway, turnaround area and parking facility for maintenance vehicles. The driveway, turnaround and parking areas shall be constructed with Size No. 4 crushed stone with a minimum depth of 6-inches. The turnaround area shall be a minimum of 20 feet deep by 12 feet wide if located outside of the pump station fence. The pump station fenced area may be increased in size from the minimum requirements of Article 4.05 (B) to incorporate the turnaround inside the fenced area upon approval by the County or its designated representative.

Wastewater Pumping Design Requirements

- B. The pump station fenced area shall be a minimum 40 feet wide by 50 feet deep. If a surge relief valve is required, the minimum fenced area shall be 40 feet wide by 60 feet deep.
- C. The pump station graded pad area shall extend a minimum 1 foot outside the fenced area. Size No. 4 stone shall be placed over the entire graded pad area, including the area outside the fence.
- D. The pump station easement shall extend a) a minimum of 5 feet outside the pump station fenced area on all sides, or b) a minimum of 2 feet from the base of the slope of the graded pump station pad on all sides.

END OF SECTION

SECTION 5

EPD SUBMITTAL GUIDELINES

5.01 General

As stated in Georgia Department of Natural Resources (DNR), Environmental Protection Division (EPD), Rules and Regulations for Water Quality Control, Chapter 391-3-6, plans and specifications for wastewater system construction must be approved by the Georgia Department of Natural Resources, Environmental Protection Division (EPD) or a delegated authority representative. The Georgia EPD has approved the Barrow County Standard Specifications for Wastewater Systems, Volumes 1 and 2.

The following are guidelines as to the information needed for the submittals to EPD or the delegated authority representative. This appendix should not be considered a complete list of all information required by EPD.

Plans must be sealed and signed by a registered professional engineer (P.E.) who is registered in the State of Georgia and is experienced in designing wastewater transport (and treatment, if applicable) systems.

The Drawings or contract documents should incorporate by reference the *Standard Specifications for Wastewater System Construction* for Barrow County. If separate specifications are prepared, the cover and/or fly sheet of the specifications shall indicate the project title, as well as the name, address and phone number of the engineering consultant preparing such document.

5.02 Transmittal Letter

A transmittal letter should be prepared by the professional engineer preparing the design for the project. This letter should be addressed to the Barrow County Planning Department and shall specifically address the following items.

- A. State whether odor complaints may be generated by construction of this project. If odor is expected or deemed to be a potential issue, odor control solutions may be required at the discretion of the Public Works Director.
- B. Provide the necessary information for the project for Barrow County to complete the EPD Sanitary Sewer Submittal Form included in this section. This shall include Items 1 B-D, 3 A-F, 4 A-D, and 5 A-B.

- C. The County must provide a statement to the reviewer indicating whether or not any of the sewers, services or other utilities associated with the project will be constructed on a solid waste landfill site.
- D. Provide a COPY of the Report of Technical Review (ROTR) by the Soil and Water Conservation District/Natural Resource Conservation Service.

5.03 Drawings

The Drawings for the project must include the following:

- A. A cover sheet containing the following information:
 - 1. Title of the Project
 - 2. Owner/Developer's name, address, phone number and fax number
 - 3. Engineer's name, address, phone number and fax number
 - 4. Funding source (i.e. private, state or federally funded)
 - 5. Project Location Map (map shall have a north arrow with indicated scale, and shall be legible and detailed enough for someone not familiar with the project to find the project site.)
 - 6. A copy of the FEMA map with the project site outlined or shaded on the map. The actual map must be copied onto the cover, not just the FIRM or panel number. The 100-year flood elevation must be indicated on the plans.
 - 7. Drawing sheet index
 - 8. The Utility Protection Center "Call Before You Dig" logo and phone number
- B. A legend of symbols used on Drawings (may be included on the cover sheet or on the first sheet of the drawings).
- C. Include a note on each plan sheet stating "Contractor shall call the Utility Protection Center "Call before you dig" 800.282.7411 prior to commencing any excavation work on the project."
- D. Provide a standard detail sheet. These details shall be the same as included in the Standard Specifications for Wastewater System Construction for Barrow County. The Drawings may incorporate, by reference, the Standard Details of the Standard Specifications for Wastewater System Construction for Barrow County.
- E. Include a plan sheet of the overall development (on one sheet if possible) that shows all gravity sewers and laterals for each lot. This plan should show the street edge of pavement, right-of-way, lot lines, and sewer utilities only. All other utilities and contours should be excluded from this plan sheet.

- F. Provide a plan and profile of the gravity sewers and the force mains. Also provide matchlines on the Drawings when more than one sheet is required to show the plan and/or profile.
- G. On gravity sewers, indicate
1. Plan and profile sheets at a scale no smaller than 1 inch = 100 feet horizontal and 1-inch = 10 feet vertical
 2. the slope of the sewer between manholes on the profile sheets,
 3. the length of pipe segments between manholes on the plan and profile
 4. angles between the manholes on the plan sheets
 5. manhole station number on the plan and profile,
 6. manhole numbers containing alpha-numeric nomenclature with the first character being a letter identifying the sewer line segment followed by a dash and sequential numbers identifying each sequential manhole located within that sewer line segment (i.e.; A-1 is the first manhole in the sewer line segment A and B-2 is the second manhole in sewer line segment B),
 7. angles between manholes on the plan sheets
 8. state plane coordinates of manholes on the plan sheets
 9. the pipe material(s) on the profile,
 10. inlet and outlet pipe elevations for each manhole on the profile
- H. Indicate on the plans whether or not the project is located within a flood zone. When a body of water is located adjacent to the proposed gravity sewer, force main, pump station or treatment facility, indicate the 100-year flood zone elevation and graphically show the flood zone boundary of the stream/river on the plans. For adjacent lakes and reservoirs, indicate the high water/winter pool elevations. If flood elevations are not available, the Developer shall determine the 100-year flood elevation to insure facilities are not in flood prone areas.

5.04 Pump Stations

When the project includes a pump station, the following pumping system design parameters are required to be submitted to the County by the Developer's engineer for forwarding to EPD:

- Total Dynamic Head (TDH) calculations, in tabular form
- Net Positive Suction Head (NPSH) calculations
- Static Head
- Pump Curves from the proposed acceptable pump manufacturers

- Pump Curves from the backup pumping system
- Specifications from the backup pumping system
- System head curve
- Wetwell volume
- Pump cycle time
- Pump station and force main friction losses
- Wetwell buoyancy calculations
- Force Main diameter and length
- Force main material of construction
- Force main plan and profile (minimum scale 1-inch = 100 feet horizontal and 1-inch = 10 feet vertical)
- Pump Station site plan (at a minimum scale of 1-inch = 20 feet)

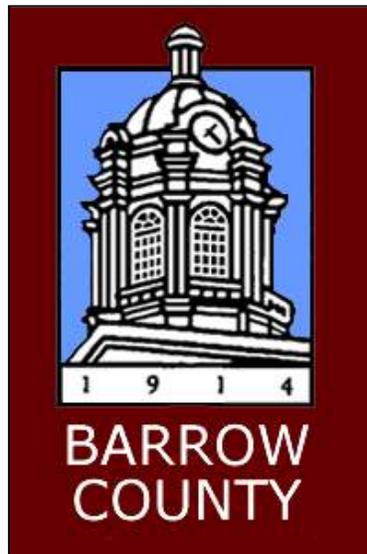
5.05 County Responsibilities

The Barrow County Director of Public Works or designated representative will prepare the submittal for EPD, including executing the Sanitary Sewer Extension Submittal with the accompanying certifications identified in Items 8 and 9 of the submittal form.

END OF SECTION

VOLUME II

**STANDARD SPECIFICATIONS
FOR
WASTEWATER SYSTEM
CONSTRUCTION**



For:

**BARROW COUNTY
BOARD OF COMMISSIONERS**

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PREFACE

The Standard Specifications have been prepared to complement and include by reference the Standard Detail Drawings and to provide the qualitative requirements for products, materials and workmanship for construction of additions to and replacements of the wastewater collection and transfer system which is to be operated by, or to be assured by a trust indenture with, the Board of Commissioners, Barrow County, Georgia. These Standard Specifications are only to be used for projects with Drawings which have been approved by the Georgia Environmental Protection Division, as prepared by the County's design consultant, or by a developer's engineer, whose Drawings must first be approved by Barrow County.

All references in these Standard Specifications to "Engineer" and "Owner" shall mean the legal and authorized representative of the Board of Commissioners, Barrow County, Georgia. All references to "Project" shall mean the work being constructed under the jurisdiction of these Standard Specifications. All references to "Contractor" shall mean the individual, company or corporation constructing work under the jurisdiction of these Standard Specifications. All references to "Drawings" shall include, by reference, the Standard Detail Drawings accompanying these Standard Specifications.

These Standard Specifications are subject to revision for a specific project, with such revisions noted on the Drawings approved by Barrow County.

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G-3	Concrete Encasement	MH-3	Standard Frame and Cover
G-4	Type I Pavement Replacement	MH-4	Watertight Frame and Cover
G-5	Type II Pavement Replacement	MH-5	Boot Connection
G-6	Type III Pavement Replacement	MH-6	Large Diameter Manhole Base
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SS-9	Concrete Pier	PS-6	Chain Link Fence Elevation
SS-10	Concrete Pier	PS-7	Bollard
SS-11	Pipe Anchorage	PS-8	Backflow Preventer

STANDARD FORMS: Pipeline Testing Form

SECTION 1 SAFETY IN WASTEWATER WORKS

PART 1 GENERAL

1.01 SCOPE

- A. The Contractor shall be responsible for conducting all Work in a safe manner and shall take reasonable precautions to ensure the safety and protection of workers, property and the general public.
- B. All construction shall be conducted in accordance with the latest applicable requirements for Part 1926 of the Occupational Safety and Health Act, Safety and Health Regulations for Construction, Section-107 of the Contract Work Hours and Safety Standards Act, as well as any other local, state or federal safety codes and regulations.
- C. The Contractor shall designate a trained and qualified employee who is to be responsible for ensuring that the Work is performed safely and in conformance with all applicable regulations.
- D. The Contractor shall determine the safety hazards involved in prosecuting the Work and the precautions necessary to conduct the Work safely.
- E. The Contractor shall bear all risks associated with performing the Work and shall fully indemnify and hold harmless the Owner and Engineer.

1.02 SPECIAL REQUIREMENTS

- A. The Contractor's attention is directed to the fact that construction activities involving sanitary sewer systems will occasionally involve work in potentially hazardous environments in which oxygen deficient, toxic or explosive conditions may exist. Additional hazards arise from the presence of pathogens in the wastewater and from the slime and scum layer that coat walking, working and other surfaces. In dealing with these hazards, the Contractor shall take special precautions to ensure worker safety. Such precautions shall include, but are not limited to, the following, as applicable:
 - 1. Installing temporary forced air ventilation equipment and ducts for fresh air in enclosed areas.
 - 2. Using pneumatic tools and equipment instead of electric-driven equipment in hazardous areas.
 - 3. Avoiding the use of cutting torches, field welding and grinders in hazardous areas.
 - 4. Cleaning and disinfecting working surfaces with hot water, high, pressure washers prior to commencing work.

5. Installing sealed wooden baffles or bulkheads to isolate working areas from hazardous atmospheres.
 6. Providing portable oxygen meters, combustible gas detectors and hydrogen sulfide detectors to continuously monitor the atmosphere in enclosed working areas.
 7. Providing safety harnesses, safety lines and recovery crews for workers in hazardous areas.
 8. Providing self-contained breathing apparatus with spare air cylinders for workers in hazardous areas.
 9. Providing dry chemical fire extinguishers and connected fire hoses in areas where a danger of fire or explosion exists.
 10. Providing adequate, oxygen-equipped, first aid facilities.
 11. Providing suitable wash-up areas and facilities for workers.
 12. Installing temporary lighting using explosion-proof fixtures in hazardous environments.
 13. Installing approved warning and hazard signs and posting safety procedures.
 14. Instructing all workers as to the hazards present, the procedures to be followed and the proper function and use of all safety and emergency equipment furnished.
- B. Prior to commencing Work on existing facilities and equipment, the Contractor shall notify the County and shall ensure that the source of electrical energy to all affected equipment is shut off and locked out at the appropriate motor control center. Local switches and pushbutton stations, where provided, shall be locked in the "off" position.
- C. Prior to entering or commencing work in a hazardous area, the Contractor shall ensure that all safety and emergency equipment is in place and in satisfactory operating condition.

END OF SECTION

SECTION 2 CLEARING AND GRUBBING

PART 1 GENERAL

1.01 SCOPE

- A. Clearing and grubbing includes, but is not limited to, removing from the Project site, trees, stumps, roots, brush, structures, abandoned utilities, trash, debris and all other materials found on or near the surface of the ground in the construction area and understood by generally accepted engineering practice not to be suitable for construction of the type contemplated. Precautionary measures that prevent damage to existing features to remain is part of the Work.
- B. Clearing and grubbing operations shall be coordinated with temporary and permanent erosion and sedimentation control procedures.

1.02 QUALITY ASSURANCE

- A. The Contractor shall comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, state or federal authorities having jurisdiction over the Project. All required permits of a temporary nature shall be obtained for construction operations by the Contractor.
- B. Open burning, if allowed, shall first be permitted by the local authority having jurisdiction. The Contractor shall notify the local fire department and abide by fire department restrictions.

1.03 JOB CONDITIONS

Location of the Work: The area to be cleared and grubbed is shown schematically on the Drawings or specified below. It includes all areas designated for construction.

1.04 PROJECT ACCESS

Where private property is used for access to the Project site, the Contractor shall obtain written permission for such access from the affected private property owners. The Contractor shall be solely responsible for all damage caused by access through the private property.

PART 2 PRODUCTS

2.01 EQUIPMENT

The Contractor shall furnish equipment of the type normally used in clearing and grubbing operations including, but not limited to, tractors, trucks and loaders.

PART 3 EXECUTION

3.01 SCHEDULING OF CLEARING

- A. The Contractor shall clear at each construction site only that length of the right-of-way, permanent or construction easement which would be the equivalent of one month's pipe laying.
- B. The Engineer may permit clearing for additional lengths of the pipe line provided that temporary erosion and sedimentation controls are in place and a satisfactory stand of temporary grass is established. Should a satisfactory stand of grass not be possible, no additional clearing shall be permitted beyond that specified above.
- C. A satisfactory stand of grass shall have no bare spots larger than one square yard. Bare spots shall be scattered and the bare area shall not comprise more than one percent of any given area.

3.02 CLEARING AND GRUBBING

- A. Clear and grub as required on each side of the pipeline before excavating. Remove all trees, growth, debris, stumps and other objectionable matter. Clear the construction easement or road right-of-way only if necessary.
- B. Grubbing shall consist of completely removing roots, stumps, trash and other debris from all graded areas so that topsoil is free of roots and debris. Topsoil is to be left sufficiently clean so that further picking and raking will not be required.
- C. All stumps, roots, foundations and planking embedded in the ground shall be removed and disposed of. Piling and butts of utility poles shall be removed to a minimum depth of two feet below the limits of excavation for structures, trenches and roadways or two feet below finish grade, whichever is lower.
- D. Landscaping features shall include, but are not necessarily limited to, fences, cultivated trees, cultivated shrubbery, property corners, man-made improvements, subdivision and other signs within the right-of-way and easement. The Contractor shall take extreme care in moving landscape features and promptly re-establishing these features.
- E. Surface rocks and boulders shall be grubbed from the soil and removed from the site if not suitable as rip rap.
- F. Where the tree limbs interfere with utility wires, or where the trees to be felled are in close proximity to utility wires, the tree shall be taken down in sections to eliminate the possibility of damage to the utility.
- G. Any work pertaining to utility poles shall comply with the requirements of the appropriate utility.

- H. All fences adjoining any excavation or embankment that, in the Contractor's opinion, may be damaged or buried, shall be carefully removed, stored and replaced. Any fencing that, in the Engineer's opinion, is significantly damaged shall be replaced with new fence material.
- I. The Contractor shall exercise special precautions for the protection and preservation of trees, cultivated shrubs, sod, fences, etc. situated within the limits of the construction area but not directly within excavation and/or fill limits. The Contractor shall be held liable for any damage the Contractor's operations have inflicted on such property.
- J. The Contractor shall be responsible for all damages to existing improvements resulting from Contractor's operations.

3.03 DISPOSAL OF DEBRIS

- A. 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. No debris of any kind shall be deposited in any stream or body of water, or in any street or alley. No debris shall be deposited upon any private property except with written consent of the property owner. A copy of written consent shall be provided to the Owner for permanent records. In no case shall any material or debris be left on the Project, shoved onto abutting private properties or buried on the Project.
- B. When approved in writing by the Owner and when authorized by the proper authorities, the Contractor may dispose of such debris by burning on the Project site provided all requirements set forth by the governing authorities are met. The authorization to burn shall not relieve the Contractor in any way from damages which may result from Contractor's operations. On easements through private property, the Contractor shall not burn on the site unless written permission is also secured from the property owner, in addition to authorization from the proper authorities.

END OF SECTION

SECTION 3 EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SCOPE

- A. All erosion and sedimentation control measures must be designed and conducted using Best Management Practices (BMP) in accordance with the Georgia Erosion and Sedimentation Act of 1975 (GESA), as amended, the Manual for Erosion and Sedimentation Control in Georgia, latest edition, Section 402 of the Federal Clean Water Act and applicable codes, ordinances, rules, regulations and laws of local and municipal authorities having jurisdiction.
- B. It is the Owner/Developer's responsibility to ensure compliance with GESA and conform to any and all NPDES guidelines and requirements.
- C. Temporary erosion controls and Best Management Practices, include, but are not limited to, grassing, mulching, watering and reseeded on-site surfaces and spoil and borrow area surfaces, and providing interceptor ditches at ends of berms and at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by the Georgia Erosion and Sedimentation Act of 1975 (GESA) and all subsequent amendments (O.C.G.A. § 12-7-1 et seq.), Section 402 of the Federal Clean Water Act,
- D. Temporary sedimentation controls include, but are not limited to, silt dams, traps, barriers, filter stone and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the Federal Clean Water Act of 1987, as amended.
- E. Land disturbance activity shall not commence until all erosion and sedimentation control measures have been installed and the Land Disturbance Permit has been issued.
- F. 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.
 - 7. All erosion and sedimentation control measures shall be designed for a minimum 25 year storm event.

8. Construct erosion and sedimentation control devices prior to clearing and excavation activities.
- G. 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.
- H. Permanent Erosion Control: Permanent erosion control measures shall be implemented to prevent sedimentation of the waterways and to prevent erosion of the Project site.

END OF SECTION

SECTION 4 TRENCH EXCAVATION AND BACKFILL

PART 1 GENERAL

1.01 SCOPE

- A. The work under this Section consists of furnishing all labor, equipment and materials and performing all operations in connection with the trench excavation and backfill required to install the pipelines shown on the Drawings and as specified.
- B. Excavation shall include the removal of any trees, stumps, brush, debris or other obstacles which remain after the clearing and grubbing operations, which may obstruct the work, and the excavation and removal of all earth, rock or other materials to the extent necessary to install the pipe and appurtenances in conformance with the lines and grades shown on the Drawings and as specified.
- C. Backfill shall include the refilling and compaction of the fill in the trenches and excavations up to the surrounding ground surface or road grade at crossing.
- D. The trench is divided into five specific areas:
 - 1. Foundation: The area beneath the bedding, sometimes also referenced to as trench stabilization.
 - 2. Bedding: The area above the trench bottom (or foundation) and below the bottom of the barrel of the pipe.
 - 3. Haunching: The area above the bottom of the barrel of the pipe up to a specified height above the bottom of the barrel of the pipe.
 - 4. Initial Backfill: The area above the haunching material and below a plane 12 inches above the top of the barrel of the pipe or the top of duct bank.
 - 5. Final Backfill: The area above a plane 12 inches above the top of the barrel of the pipe.
- E. The choice of method, means, techniques and equipment rests with the Contractor. The Contractor shall select the method and equipment for trench excavation and backfill depending upon the type of material to be excavated and backfilled, the depth of excavation, the amount of space available for operation of equipment, storage of excavated material proximity of man-made improvements to be protected, available easement or right-of-way and prevailing practice in the area.

1.02 QUALITY ASSURANCE

- A. Density: All references to "maximum dry density" shall mean the maximum dry density defined by ASTM D 698, except that for cohesionless, free draining soils "maximum dry density" shall mean the maximum index density as determined by ASTM D 4253. Determination of the density of foundation, bedding, haunching, or backfill materials in place shall meet with the requirements of ASTM D 1556, ASTM D 2922 or ASTM D 2937.

- B. Sources and Evaluation Testing: Testing of materials to certify conformance with the Specifications shall be performed by an independent testing laboratory. All imported fill materials shall meet the requirements of on-site fill materials.

1.03 SAFETY

Perform all trench excavation and backfilling activities in accordance with the Occupational Safety and Health Act of 1970 (PL 91-596), as amended. The Contractor shall pay particular attention to the Safety and Health Regulations Part 1926, Subpart P "Excavation, Trenching & Shoring" as described in OSHA publication 2226. Particular attention is drawn to the requirement that the Contractor must have on site and individual with current competent person training certification.

PART 2 PRODUCTS

2.01 TRENCH FOUNDATION MATERIALS

Crushed stone shall be utilized for trench foundation (trench stabilization) and shall meet the requirements of the Georgia Department of Transportation Specification 800.01, Group I (limestone, marble or dolomite) or Group II (quartzite, granite or gneiss). Stone sizes shall be between No. 57 and No. 4, inclusive.

2.02 BEDDING AND HAUNCHING MATERIALS

- A. Unless shown on the Drawings or specified otherwise, bedding and haunching materials shall be as follows:
 - 1. Gravity Sewers: Crushed stone as specified above.
 - 2. Gravity Sewer Services: Earth materials as specified below, except under pavement.
 - 3. Force Mains: Earth materials as specified below, except under pavement.
- B. Under Pavement: Bedding and haunching material under all pavement areas or where the trench is within three feet of the pavement edge shall be crushed stone as specified above.
- C. Earth materials utilized for bedding and haunching shall be suitable materials selected from materials excavated from the trench. Suitable materials shall be clean and free of rock larger than 2 inches at its largest dimension, organics, cinders, stumps, limbs, frozen earth or mud, man-made wastes and other unsuitable materials. Should the material excavated from the trench be saturated, the saturated material may be used as earth material, provided it is allowed to dry properly and it is capable of meeting the specified compaction requirements. When necessary, earth bedding and haunching materials shall be moistened to facilitate compaction by tamping. If materials excavated from the trench are not suitable for use as bedding or haunching material, provide select material conforming to the requirements of this Section.

2.03 INITIAL BACKFILL

- A. Unless shown on the Drawings or specified otherwise, initial backfill material shall be crushed stone or earth materials as specified for bedding and haunching materials.
- B. Earth materials utilized for initial backfill shall be suitable materials selected from materials excavated from the trench. Suitable materials shall be clean and free of rock larger than 2 inches at its largest dimension, organics, cinders, stumps, limbs, frozen earth or mud, man-made wastes and other unsuitable materials. Should the material excavated from the trench be saturated, the saturated material may be used as earth material, provided it is allowed to dry properly and it is capable of meeting the specified compaction requirements. When necessary, initial backfill materials shall be moistened to facilitate compaction by tamping. If materials excavated from the trench are not suitable for use as initial backfill material, provide select material conforming to the requirements of this Section.

2.04 FINAL BACKFILL

Unless shown on the Drawings or specified otherwise, final backfill material shall be general excavated earth materials, shall not contain more than one-third broken rock, of which no stone or boulder shall weigh more than 50 pounds, cinders, stumps, limbs, man-made wastes and other unsuitable materials. If materials excavated from the trench are not suitable for use as final backfill material, provide select material conforming to the requirements of this Section.

2.05 SELECT BACKFILL

Select backfill shall be materials which meet the requirements as specified for bedding, haunching, initial backfill or final backfill materials, including compaction requirements.

2.06 CONCRETE

Concrete for bedding, haunching, initial backfill or encasement shall have a compressive strength of not less than 3,000 psi, with not less than 5.5 bags of cement per-cubic yard and a slump between 3 and 5 inches. Ready-mixed concrete shall be mixed and transported in accordance with ASTM C 94. Reinforcing steel shall conform to the requirements of ASTM A 615, Grade 60.

2.07 FLOWABLE FILL

Flowable fill, where required for trench backfill, shall meet the requirements of Georgia Department of Transportation Standard Specifications, Section 600 for Excavatable or Non-Excavatable type.

2.08 GRANULAR MATERIAL

Granular material, where required for trench backfill, shall be sand, river sand, crushed stone or aggregate, pond screenings, crusher run, recycled concrete, or other angular material. Granular material shall meet gradation requirements for Size No. 57 or finer.

PART 3 EXECUTION

3.01 TRENCH EXCAVATION

- A. Topsoil and grass shall be stripped a minimum of 6 inches over the trench excavation site and stockpiled separately for replacement over the non-paved, finished grading areas.
- B. Trenches shall be excavated to the lines and grades shown on the Drawings with the centerlines of the trenches on the centerlines of the pipes and to the dimensions which provide the proper support and protection of the pipe and other structures and accessories.
- C. Trench Width for Pipelines
 - 1. The sides of all trenches shall be as vertical as is practical to a minimum of one foot above the top of the pipe. Unless otherwise indicated on the Drawings, the maximum trench width shall be equal to the sum of the outside diameter of the pipe plus two feet. The minimum trench width shall be that which allows the proper consolidation of the haunching and initial backfill material.
 - 2. Excavate the top portion of the trench to any width within the construction easement or right-of-way which will not cause unnecessary damage to adjoining structures, roadways, pavement, utilities, trees or private property. Where necessary to accomplish this, provide sheeting and shoring.
 - 3. Where rock is encountered in trenches, excavate to remove boulders and stones to provide a minimum of 6 inches clearance between the rock and any part of the pipe or manhole.
 - 4. Wherever the prescribed maximum trench width is exceeded, the Contractor shall use the next higher Class or Type of bedding and haunching as shown on the Drawings for the full trench width as actually cut. The excessive trench width may be due to unstable trench walls, inadequate or improperly placed bracing and sheeting which caused sloughing, accidental over-excavation, intentional over-excavation necessitated by the size of the Contractor's tamping and compaction equipment, intentional over-excavation due to the size of the Contractor's excavation equipment, or other reasons beyond the control of the Engineer or Owner.
- D. Depth
 - 1. The trenches shall be excavated to the required depth or elevation which allow for the placement of the pipe and bedding to the dimensions shown on the Drawings or specified.
 - 2. Force Mains
 - a. Excavate trenches to provide a minimum cover of 36 inches. Within the right-of-way of highways, streets or roadways, also excavate to place the top

of the pipe a minimum of 36 inches below the nearest pavement edge or drainage ditch.

- b. Increase the depth of cover where specifically shown on the Drawings and where necessary to avoid interference with underground utilities and obstructions.
3. Where rock is encountered in trenches for pipelines, excavate to the minimum depth which will provide clearance below the pipe barrel of 8 inches for pipe 21 inches in diameter and smaller and 12 inches for larger pipe, valves and manholes. Remove boulders and stones to provide a minimum of 6-inches clearance between the rock and any part of the pipe, manhole or accessory.
- E. Excavated Material
1. Excavated materials shall be placed adjacent to the work to be used for Backfilling as required. Top soil shall be carefully separated and lastly placed in its original location.
 2. Excavated material shall be placed sufficiently back from the edge of the excavation to prevent caving of the trench wall, to permit safe access along the trench and not cause any drainage problems. Excavated material shall be placed so as not to damage existing landscape features or man-made improvements.
- F. Sewer trench excavation shall not extend more than 400 feet beyond pipe installation.

3.02 SHEETING, BRACING AND SHORING

- A. Sheeting, bracing and shoring shall be performed in the following instances:
1. Where sloping of the trench walls does not adequately protect persons within the trench from slides or cave-ins.
 2. In caving ground.
 3. In wet, saturated, flowing or otherwise unstable materials. The sides of all trenches and excavations shall be adequately sheeted, braced and shored.
 4. Where necessary to prevent damage to adjoining buildings, structures, roadways, pavement, utilities, trees or private properties which are required to remain.
 5. Where necessary to maintain the top of the trench within the available construction easement or right-of-way.
- B. In all cases, excavation protection shall strictly conform to the requirements of the Occupational Safety and Health Act of 1970, as amended. The County shall direct where density tests will be performed along the Project route.
- C. Timber: Timber for shoring, sheeting, or bracing shall be sound and free of large or loose knots and in good, serviceable condition. Size and spacing shall be in accordance with OSHA regulations.

- D. Steel Sheet piling and Sheet Piling: Steel sheet piling shall be the continuous interlock type. The weight, depth and section modulus of the sheet piling shall be sufficient to restrain the loads of earth pressure and surcharge from existing foundations and live loads. Procedure for installation and bracing shall be so scheduled and coordinated with the removal of the earth that the ground under existing structures shall be protected against lateral movement at all times. The Contractor shall provide closure and sealing between sheet piling and existing facilities.
- E. Trench Shield: A trench shield or box may be used to support the trench walls. The use of a trench shield does not necessarily preclude the additional use of bracing and sheeting. When trench shields are used, care must be taken to avoid disturbing the alignment and grade of the pipe or disrupting the haunching of the pipe as the shield is moved. When the bottom of the trench shield extends below the top of the pipe, the trench shield will be raised in 6-inch increments with specified backfilling occurring simultaneously. At no time shall the trench shield be "dragged" with the bottom of the shield extending below the top of the pipe or utility.
- F. Remove bracing and sheeting in units when backfill reaches the point necessary to protect the pipe and adjacent property. Leave sheeting in place when in the opinion of the Engineer it cannot be safely removed or is within three feet of an existing structure, utility, or pipeline. Cut off any sheeting left in place at least two feet below the surface.
- G. Sheet piling within three feet of an existing structure or pipeline shall remain in place, unless otherwise directed by the Engineer.

3.03 ROCK EXCAVATION

- A. Definition of Rock: Any material which cannot be excavated with conventional excavating equipment, and is removed by drilling and blasting, and occupies an original volume of at least one-half cubic yard.
- B. Blasting: Provide licensed, experienced workmen to perform blasting. Conduct blasting operations in accordance with all existing ordinances and regulations. Protect all buildings and structures from the effects of the blast. Repair any resulting damage. If the Contractor repeatedly uses excessive blasting charges or blasts in an unsafe or improper manner, the Engineer may direct the Contractor to employ an independent blasting consultant to supervise the preparation for each blast and approve the quantity of each charge.
- C. Removal of Rock: Dispose of rock off site that is surplus or not suitable for use as rip rap or backfill.
- D. The Contractor shall notify the Engineer prior to any blasting. Additionally, the Contractor shall notify the Engineer and local fire department before any charge is set.
- E. The Contractor shall conduct pre-blast and post-blast inspections of structures, including photographs or videos, and maintain a detailed written log.
- F. Where blasting is to be performed on Georgia Department of Transportation right-of-

way, the Contractor shall be responsible for providing the Owner sufficient information to obtain a blasting permit from the Georgia DOT in a timely manner.

3.04 DEWATERING EXCAVATIONS

- A. Dewater excavation continuously to maintain a water level two feet below the bottom of the trench.
- B. Control drainage in the vicinity of excavation so the ground surface is properly pitched to prevent water running into the excavation.
- C. There shall be sufficient pumping equipment, in good working order, available at all times, to remove any water that accumulates in excavations. Where the utility crosses natural drainage channels, the work shall be conducted in such a manner that unnecessary damage or delays in the prosecution of the work will be prevented. Provision shall be made for the satisfactory disposal of surface water to prevent damage to public or private property.
- D. In all cases, accumulated water in the trench shall be removed before placing bedding or haunching, laying pipe, placing concrete or backfilling.
- E. Where dewatering is performed by pumping the water from a sump, crushed stone shall be used as the medium for conducting the water to the sump. Sump depth shall be at least two feet below the bottom of the trench, Pumping equipment shall be of sufficient quantity and/or capacity to maintain the water level in the sump two feet below the bottom of the trench. Pumps shall be a type such that intermittent flows can be discharged. A standby pump shall be required in the event the operating pump or pumps clog or otherwise stop operation.
- F. Dewater by use of a well point system when pumping from sumps does not lower the water level two feet below the trench bottom. Where soil conditions dictate, the Contractor shall construct well points cased in sand wicks. The casing, 6 to 10-inches in diameter, shall be jetted into the ground, followed by the installation of the well point, filling casing with sand and withdrawing the casing.

3.05 TRENCH FOUNDATION AND STABILIZATION

- A. The bottom of the trench shall provide a foundation to support the pipe and its specified bedding. The trench bottom shall be graded to support the pipe and bedding uniformly throughout its length and width.
- B. If, after dewatering as specified above, the trench bottom is spongy, or if the trench bottom does not provide firm, stable footing and the material at the bottom of the trench will still not adequately support the pipe, the trench will be determined to be unsuitable and the Engineer shall then authorize placement of trench stabilization.
- C. Should the undisturbed material encountered at the trench bottom constitute, in the opinion of the Engineer, an unstable foundation for the pipe, the Contractor shall be required to remove such unstable material and fill the trench to the proper subgrade with crushed stone as directed by the Engineer.

- D. Where trench stabilization is provided, the trench stabilization material shall be compacted to at least 90 percent of the maximum dry density, unless shown or specified otherwise.

3.06 BEDDING AND HAUNCHING

- A. Prior to placement of bedding material, the trench bottom shall be free of any water, loose rocks, boulders or large dirt clods.
- B. Bedding material shall be placed to provide uniform support along the bottom of the pipe and to place and maintain the pipe at the proper elevation. The initial layer of bedding placed to receive the pipe shall be brought to the grade and dimensions indicated on the Drawings. All bedding shall extend the full width of the trench bottom. The pipe shall be placed and brought to grade by tamping the bedding material or by removal of the excess amount of the bedding material under the pipe. Adjustment to grade line shall be made by scraping away or filling with bedding material. Wedging or blocking up of pipe shall not be permitted. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade shall not be permitted. Each pipe section shall have a uniform bearing on the bedding for the length of the pipe, except immediately at the joint.
- C. At each joint, excavate bell holes of ample depth and width to permit the joint to be assembled properly and to relieve the pipe bell of any load.
- D. After the pipe section is properly placed, add the haunching material to the specified depth. The haunching material shall be shovel sliced, tamped, vigorously chinked or otherwise consolidated to provide uniform support for the pipe barrel and to fill completely the voids under the pipe, including the bell hole. Prior to placement of the haunching material, the bedding shall be clean and free of any water, loose rocks, boulders or dirt clods.
- E. Gravity Sewers
 1. PVC Pipe: Excavate the bottom of the trench flat at a minimum depth as shown on the Drawings, below the bottom of the pipe barrel. Place and compact bedding material to the proper grade. Haunching material shall then be carefully placed by hand and compacted to provide full support under and up to the top of the pipe.
 2. Ductile Iron Pipe: Excavate the bottom of the trench flat at a minimum depth as shown on the Drawings, below the bottom of the pipe barrel. Place and compact bedding material to the proper grade. Haunching material shall then be carefully placed by hand and compacted to provide full support under and up to a height of one-fourth the outside diameter of the pipe above the bottom of the pipe barrel
- F. Manholes: Excavate to a minimum of 12 inches below the planned elevation of the base of the manhole. Place and compact crushed stone bedding to the required grade before constructing the manhole.

- G. Ductile Iron Pipe Force Mains
 - 1. Unless otherwise shown on the Drawings or specified, utilize earth materials for bedding and haunching.
 - 2. Unless specified or shown otherwise, bedding shall meet the requirements for Type 2 Pipe Bedding. Unless specified or shown otherwise for restrained joint pipe and fittings, bedding shall meet the requirements for Type 3 Pipe Bedding_
- H. Excessive Width and Depth
 - 1. Gravity Sewers: If the trench is excavated to excess width, fill the trench with crushed stone to 6-inches above the top of the pipe.
 - 2. Pressure Mains: If the trench is excavated to excess width, fill the trench with crushed stone to the quarter point on the pipe.
 - 3. If the trench is excavated to excessive depth, provide crushed stone to place the bedding at the proper elevation or grade.
- I. Compaction: Bedding and haunching materials under pipe, manholes and accessories shall be compacted to a minimum of 90 percent of the maximum dry density, unless shown or specified otherwise.

3.07 INITIAL BACKFILL

- A. Initial backfill shall be placed to anchor the pipe, protect the pipe from damage by subsequent backfill and ensure the uniform distribution of the loads over the top of the pipe.
- B. Place initial backfill material carefully around the pipe in uniform layers to a depth of at least 12 inches above the pipe barrel. Layer depths shall be a maximum of 6 inches.
- C. Backfill on both sides of the pipe simultaneously to prevent side pressures.
- D. Compact each layer thoroughly with suitable hand tools or tamping equipment.
- E. Initial backfill shall be compacted to a minimum 90 percent of the maximum dry density, unless shown or specified otherwise.
- F. If materials excavated from the trench are not suitable for use as backfill materials, provide select backfill material conforming to the requirements of this Section.

3.08 CONCRETE ENCASEMENT FOR PIPELINES

Where concrete encasement is shown on the Drawings for pipelines, excavate the trench to provide a minimum of 12-inches clearance from the barrel of the pipe. Lay the pipe to line and grade on concrete blocks. In lieu of bedding, haunching and initial backfill, place concrete to the full width of the trench and to a height of not less than 12 inches above the pipe barrel. Do not backfill the trench for a period of at least 24 hours after concrete is placed.

3.09 FINAL BACKFILL

- A. Backfill carefully to restore the ground surface to its original condition.
- B. Except under pavement areas, the top 6 inches shall be topsoil obtained as specified in "Trench Excavation" of this Section.
- C. Excavated material which is unsuitable for backfilling, and excess material, shall be disposed of in a manner approved by the Engineer and in a manner that will not adversely impact the environment. Surplus soil may be neatly distributed and spread over the site, if approved by the Engineer. If such spreading is allowed, the site shall be left in a clean and sightly condition and shall not affect pre-construction drainage patterns. Surplus rock from the trenching operations shall be removed from the site.
- D. If materials excavated from the trench are not suitable for use as backfill materials, provide select backfill material conforming to the requirements of this Section.
- E. After initial backfill material has been placed and compacted, backfill with final backfill material. Place backfill material in uniform layers, compacting each layer thoroughly as follows:
 - 1. In 6 inch layers, if using light power tamping equipment, such as a "jumping jack"
 - 2. In 12 inch layers, if using heavy tamping equipment, such as hammer with tamping feet
 - 3. In 24 inch layers, if using a hydra-hammer
- F. Settlement: If trench settles, re-fill and grade the surface to conform to the adjacent surfaces.
- G. Final backfill shall be compacted to a minimum 90 percent of the maximum dry density, unless specified otherwise.

3.10 ADDITIONAL MATERIAL

Where final grades above the pre-construction grades are required to maintain minimum cover, additional fill material will be as shown on the.. Drawings. Utilize excess material excavated from the trench, if the material is suitable. - If excess excavated materials are not suitable, or if the quantity available is not sufficient, provide additional suitable fill material.

3.11 BACKFILL UNDER ROADS

Compact backfill underlying pavement and sidewalks, and backfill under dirt and gravel roads to a minimum 95 percent of the maximum dry density. The top 12 inches shall be compacted to a minimum of 98 percent of the maximum dry density.

3.12 BACKFILL WITHIN GEORGIA DOT RIGHT-OF-WAY

Backfill within the Georgia DOT right-of-way shall meet the requirements stipulated in the "Utility Accommodation Policy and Standards", published by the Georgia Department of Transportation.

3.13 BACKFILL ALONG RESTRAINED JOINT PIPE

Backfill along restrained joint pipe shall be compacted to a minimum 90 percent of the maximum dry density.

3.14 FLOWABLE FILL

- A. Where flowable fill is required, excavate the trench to provide a minimum of 6-inches clearance on either side of the pipe barrel. Lay the pipe to line and grade on solid concrete blocks or bricks. In lieu of bedding, haunching and initial backfill, place flowable fill to the full width and depth of the trench.
- B. Flowable fill shall be protected from freezing for a period of 36 hours after placement. Minimum temperature of flowable fill at point of delivery shall be 50 degrees F.
- C. The Contractor shall provide steel plates over flowable fill in road locations.

3.15 COMPACTED GRANULAR MATERIAL

Where compacted granular material is required as initial and final backfill material, it shall be placed after bedding and haunching material specified elsewhere has been placed. Compacted granular material shall be compacted to a minimum 95 percent of the maximum dry density.

3.16 TESTING AND INSPECTION

- A. All costs associated with compaction testing ordered by the County shall be paid for by the Contractor.
- B. Frequency: The extent of testing required shall be reasonable, but shall also be dependent upon soil conditions, Contractor's means and methods of operation, and regulatory requirements. As a minimum, compaction tests shall be performed in two foot lifts at a single location between each manhole per each existing or proposed public right-of-way. The County will direct where density tests will be performed along the Project route.
- C. The soils testing laboratory is responsible for the following:
 1. Compaction tests in accordance with Article 1.02 of this Section.
 2. Inspecting and testing stripped site, subgrades and proposed fill materials.
- D. The Contractor's duties relative to testing include:
 1. Notifying laboratory of conditions requiring testing.
 2. Coordinating with laboratory for field testing.
 3. Paying costs for testing, including testing performed beyond the scope of that required, and for re-testing where initial tests reveal non-conformance with specified requirements.
 4. Providing excavation as necessary for laboratory personnel to conduct tests.

- E. Inspection
 - 1. Earthwork operations, acceptability of excavated materials for bedding or backfill, and placing and compaction of bedding and backfill is subject to inspection by the Engineer.
 - 2. Where required by the Engineer, foundations and shallow spread footing foundations are required to be inspected by a geotechnical engineer, who shall verify suitable bearing and construction.
- F. Comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, state or federal authorities having jurisdiction.

END OF SECTION

SECTION 5 BORE AND JACK CASINGS

PART 1 GENERAL

1.01 SCOPE

- A. The work covered by this Section includes furnishing all labor, materials and equipment required to bore and jack casings and to properly complete pipeline construction as described herein and/or shown on the Drawings.
- B. Supply all materials and perform all work in accordance with applicable American Society for Testing and Materials (ASTM), American Water Works Association (AWWA), American National Standards Institute (ANSI) or other recognized standards. Latest revisions of all standards are applicable. If requested by the Engineer, submit evidence that manufacturer has consistently produced products of satisfactory quality and performance over a period of at least two years.

1.02 SUBMITTALS

- A. If required by the County or Engineer, submit shop drawings, product data and experience.
- B. Material Submittals: If required by the County or Engineer, the Contractor shall provide shop drawings and other pertinent specifications and product data as follows:
 - 1. Shop drawings for casing pipe showing sizes and connection details.
 - 2. Design mixes for concrete and grout.
 - 3. Casing Spacers.
- C. Experience Submittals: Boring and jacking casings is deemed to be specialty contractor work. A minimum of five continuous years of experience in bore and jack casing construction is required of the casing installer. Evidence of this experience must be provided for review by the Engineer.

1.03 STORAGE AND PROTECTION

All materials shall be stored and protected in accordance with the manufacturer's recommendations and as approved by the Engineer.

PART 2 PRODUCTS

2.01 MATERIALS AND CONSTRUCTION

- A. Casing
 - 1. The casing shall be new and unused pipe. The casing shall be made from steel plate having a minimum yield strength of 35,000 psi. The steel plate shall also meet the chemical requirements of ASTM A 36.

2. The thicknesses of casing shown in paragraph B. below are minimum thicknesses. Actual thicknesses shall be determined by the casing installer, based on its evaluation of the required forces to be exerted on the casing when jacking. Any buckling of the casing due to jacking forces shall be repaired.
3. The diameters of casing shown in paragraph B. below and shown on the Drawings are minimum. Larger casings, with the Engineer's approval, may be provided for whatever reasons the Contractor may decide, whether casing size availability, line and grade tolerances, soil conditions, etc.

B. Casing Sizes

UNDER HIGHWAYS		
Pipe Diameter, inches	Casing Diameter, inches	Wall Thickness, inches
6	12	0.250
8	16	0.250
10	16	0.250
12	18	0.250
14	22	0.250
16	24	0.250
18	26	0.312

- C. Casing Spacers: Casing spacers shall meet one of the following requirements:
1. Casing spacers shall be flanged, bolt-on style with a two-section stainless steel shell lined with a PVC liner, minimum 0.09-inch thick also having a hardness of 85-90 durometer. Runners shall be attached to stainless steel risers which shall be properly welded to the shell. The height of the runners and risers shall be manufactured such that the pipe does not float within the casing. Casing spacers shall be Cascade Waterworks Manufacturing Company or Advanced Products & Systems, Inc.
 2. Casing spacers shall be a two-section, flanged, bolt on style constructed of heat fused PVC coated steel, minimum 14 gauge band and 10 gauge risers, with 2-inch wide glass reinforced polyester insulating skids, heavy duty PVC inner liner, minimum 0.09-inch thick having a hardness of 85-90 durometer, and all stainless steel or cadmium plated hardware shall be Pipeline Seal and Insulator, Inc.
- D. Grout: Grout may be used for filling the void between the casing pipe and the carrier pipe: Cement shall conform to ASTM C 150, Type I or Type II. Grout shall have a minimum compressive strength of 100 psi attained within 24 hours.
- E. Carrier Pipe: Carrier pipes shall meet requirements as specified in Section 8 or Section 9 of these Specifications.

- F. Surface Settlement Markers: Surface settlement markers within pavement areas shall be nails. Surface settlement markers within non-paved areas shall be wooden hubs.

2.02 EQUIPMENT

- A. A cutting head shall be attached to a continuous auger mounted inside the casing pipe.
- B. On casing pipe for gravity sewer over 60 feet in length, the installation equipment shall include a steering head and a grade indicator.
- C. The steering head shall be controlled manually from the bore pit. The grade indicator shall consist of a water level attached to the casing which would indicate the elevation of the front end of the casing or some other means for grade indication approved by the Engineer.

PART 3 EXECUTION

3.01 GENERAL

- A. Interpretation of soil investigation reports and data, investigating the site and determination of the site soil conditions prior to bidding is the sole responsibility of the Contractor. Any subsurface investigation by the Contractor must be approved by the appropriate authority having jurisdiction over the site.
- B. Casing construction shall be performed so as not to interfere with, interrupt or endanger roadway surface and activity thereon, and minimize subsidence of the surface, structures, and utilities above and in the vicinity of the casing. Support the ground continuously in a manner that will prevent loss of ground and keep the perimeters and face of the casing, passages and shafts stable. The Contractor shall be responsible for all settlement resulting from casing operations and shall repair and restore damaged property to its original or better condition.
- C. Face Protection: The face of the excavation shall be protected from the collapse of the soil into the casing.
- D. Casing Design: Design of the bore pit and required bearing to resist jacking forces are the responsibility of the Contractor. The excavation method selected shall be compatible with expected ground conditions. The lengths of the casing shown on the Drawings are the minimum lengths required. The length of the casing may be extended for the convenience of the Contractor, at no additional cost to the County. Due to restrictive right-of-way and construction easements, casing lengths less than the nominal 20 foot length may be necessary.
- E. Highway Crossings
 - 1. The Contractor shall be held responsible and accountable for the coordinating and scheduling of all construction work within the highway right-of-way.
 - 2. Work along or across the highway department rights-of-way shall be subject to inspection by such highway department.

3. All installations shall be performed to leave free flows in drainage ditches, pipes, culverts or other surface drainage facilities of the highway, street or its connections.
 4. No excavated material or equipment shall be placed on the pavement or shoulders of the roadway without the express approval of the highway department.
 5. In no instance will the Contractor be permitted to leave equipment (trucks, backhoes, etc.) on the pavement or shoulder overnight. Construction materials to be installed, which are placed on the right-of-way in advance of construction, shall be placed in such a manner as not to interfere with the safe operation of the roadway.
 6. Where blasting is to be performed on Georgia Department of Transportation right-of-way, the Contractor shall be responsible for providing the County sufficient information to obtain a blasting permit from the Georgia DOT in a timely manner.
- F. Railroad Crossings
1. The Contractor shall secure permission from the Railroad to schedule work so as not to interfere with the operation of the Railroad.
 2. Additional insurance is required for each railroad crossing. The Contractor shall furnish the Railroad with such additional insurance as may be needed. Cost of the same shall be borne by the Contractor.
 3. All work on the Railroad right-of-way, including necessary support of tracks, safety of operations and other standard and incidental operation procedures may be under the supervision of the appropriate authorized representative of the Railroad affected and any decisions of this representative pertaining to construction and/or operations shall be final and construction must be governed by such decisions.
 4. If, in the opinion of the Railroad, it becomes necessary to provide flagging protection, watchmen or the performance of any other work in order to keep the tracks safe for traffic, the Contractor shall coordinate such work and shall reimburse the Railroad, in cash, for such services, in accordance with accounting procedures agreed on by the Contractor and affected Railroad before construction is started.
 5. No blasting shall be permitted within the Railroad right-of-way

3.02 GROUNDWATER CONTROL

- A. The Contractor shall control the groundwater throughout the construction of the casing.
- B. Methods of dewatering shall be at the option and responsibility of the Contractor. Maintain close observation to detect settlement or displacement of surface facilities

due to dewatering. Should settlement or displacement be detected, notify the Engineer immediately and take such action as necessary to maintain safe conditions and prevent damage.

- C. When water is encountered, provide and maintain a dewatering system of sufficient capacity to remove water on a 24 hour basis keeping excavations free of water until the backfill operation is in progress. Dewatering shall be performed in such a manner that removal of soil particles is held to minimum. Dewater into a sediment trap and comply with requirements specified in Section 3 of these Specifications.

3.03 SAFETY

- A. Provide all necessary bracing, bulkheads and shields to ensure complete safety to all traffic, persons and property at all times during the work. Perform the work in such a manner as to not permanently damage the roadbed or interfere with normal traffic over it.
- B. Observe all applicable requirements of the regulations of the authorities having jurisdiction over this site. Conduct the operations in such a manner that all work will be performed below the level of the roadbed.
- C. Perform all activities in accordance with the Occupational Safety and Health Act of 1970 (PL-596), as amended, applicable regulations of the Federal Government, OSHA 29CFR 1926 and applicable criteria of ANSI A10.16-81, "Safety Requirements for Construction of Tunnel Shafts and Caissons".

3.04 SURFACE SETTLEMENT MONITORING

- A. Provide surface settlement markers for casings 24-inches in diameter and larger. Place marker as specified and as directed by the Engineer. The Contractor shall place settlement markers outside of pavement area, along the centerline of the casing at 20 foot intervals and offset 10 feet each way from the centerline of the casing. Markers shall also be placed at each shoulder of the roadway, at each edge of pavement, at the centerline of the pavement and at 10 and 25 feet in each direction from the centerline of the casing. Tie settlement markers to bench marks and indices sufficiently removed as not to be affected by the casing operations.
- B. Make observations of surface settlement markers, placed as required herein, at regular time intervals acceptable to the Engineer. In the event settlement or heave on any marker exceeds 1-inch, the Contractor shall immediately cease work and using a method approved by the Engineer and the authority having jurisdiction over the project site, take immediate action to restore surface elevations to that existing prior to start of casing operations.
- C. Take readings and permanently record surface elevations prior to start of dewatering operations and/or shaft excavation. The following schedule shall be used for obtaining and recording elevation readings: all settlement markers, once a week; all settlement markers within 50 feet of the casing heading, at the beginning of each day; more frequently at the Engineer's direction if settlement is identified. Make all elevation

measurements to the nearest 0.01 foot.

- D. The Contractor shall cooperate fully with jurisdictional personnel. Any settlement shall be corrected by, and at the expense of, the Contractor.
- E. Promptly report any settlement and horizontal movement immediately to the Engineer and take immediate remedial action.

3.05 CASING INSTALLATION

A. Shaft

1. Conduct boring and jacking operations from a shaft excavated at one end of the section to be bored. Where conditions and accessibility are suitable, place the shaft on the downstream end of the bore.
2. The shaft shall be rectangular and excavated to a width and length required for ample working space. If necessary, sheet and shore shaft properly on all sides. Shaft sheeting shall be timber or steel piling of ample strength to safely withstand all structural loadings of whatever nature due to site and soil conditions. Keep preparations dry during all operations. Perform pumping operations as necessary.
3. The bottom of the shaft shall be firm and unyielding to form an adequate foundation upon which to work. In the event the shaft bottom is not stable, excavate to such additional depth as required and place a gravel sub-base or a concrete sub-base if directed by the Engineer due to soil conditions.

B. Jacking Rails and Frame

1. Set jacking rails to proper line and grade within the shaft. Secure rails in place to prevent settlement or movement during operations. The jacking rails shall cradle and hold the casing pipe on true line and grade during the progress of installing the casing.
2. Place backing between the heels of jacking rails and the rear of the shaft. The backing shall be adequate to withstand all jacking forces and loads.
3. The jacking frame shall be of adequate design for the magnitude of the job. Apply thrust to the end of the pipe in such a manner to impart a uniformly balanced load to the pipe barrel without damaging the joint ends of the pipe.

- C. Boring and jacking of casing pipes shall be accomplished by the dry auger boring method without jetting, sluicing or wet boring.
- D. Auger the hole and jack the casing through the soil simultaneously.
- E. Bored installations shall have a bored-hole diameter essentially the same as the outside diameter of the casing pipe to be installed.
- F. Execute boring ahead of the casing pipe with extreme care, commensurate with the rate of casing pipe penetration. Boring may proceed slightly in advance of the penetrating pipe and shall be made in such a manner to prevent any voids in the earth

around the outside perimeter of the pipe. Make all investigations and determine if the soil conditions are such as to require the use of a shield.

- G. As the casing is installed, check the horizontal and vertical alignment frequently. Make corrections prior to continuing operation. For casing pipe installations over 100 feet in length, the auger shall be removed and the alignment and grade checked at minimum intervals of 60 feet.
- H. Any casing pipe damaged in jacking operations shall be repaired, if approved by the Engineer, or removed and replaced at Contractor's own expense.
- I. Lengths of casing pipe, as long as practical, shall be used except as restricted otherwise. Joints between casing pipe sections shall be butt joints with complete joint penetration, single groove welds, for the entire joint circumference, in accordance with AWS recommended procedures. Prior to welding the joints, the Contractor shall ensure that both ends of the casing sections being welded are square.
- J. The Contractor shall prepare a contingency plan which will allow the use of a casing lubricant, such as bentonite, in the event excessive frictional forces jeopardize the successful completion of the casing installation.
- K. Once the jacking procedure has begun, it should be continued without stopping until completed, subject to weather and conditions beyond the control of the Contractor.
- L. Care shall be taken to ensure that casing pipe installed by boring and jacking method will be at the proper alignment and grade.
- M. The Contractor shall maintain and operate pumps and other necessary drainage system equipment to keep work dewatered at all times.
- N. Adequate sheeting, shoring and bracing for embankments, operating pits and other appurtenances shall be placed and maintained to ensure that work proceeds safely and expeditiously. Upon completion of the required work, the sheeting, shoring and bracing shall be left in place, cut off or removed, as designated by the Engineer.
- O. Trench excavation, all classes and type of excavation, the removal of rock, muck, debris, the excavation of all working pits and backfill requirements of Section 4 are included under this Section.
- P. All surplus material shall be removed from the right-of-way and the excavation finished flush with the surrounding ground.
- Q. Grout backfill shall be used for unused holes or abandoned pipes.
- R. Any replacement of carrier pipe in an existing casing shall be considered a new installation, subject to the applicable requirements of these Specifications.

3.06 FREE BORING

- A. Where the Drawings indicate a pipeline is to be installed by boring without casing, the Contractor shall construct the crossing by the free bore method. The free bore method

shall be accomplished by the dry auger boring method without jetting, sluicing, or wet boring.

- B. The diameter of the free bore shall not exceed the pipe bell outside diameter or the pipe barrel outside diameter plus 1-inch, whichever is greater.
- C. Free boring, where indicated on the Drawings, is to be performed at the Contractor's option. The Contractor may choose to construct the crossing by the conventional bore and jack casing methodology.
- D. The Contractor shall be responsible for any settlement of the roadway caused by the free bore construction activities.

3.07 VENTILATION AND AIR QUALITY

Provide, operate and maintain for the duration of casing project a ventilation system to meet safety and OSHA requirements.

3.08 ROCK EXCAVATION

- A. In the event that rock is encountered during the installation of the casing pipe which, in the opinion of the Engineer, cannot be removed through the casing, the Engineer may authorize the Contractor to complete the crossing by another method.
- B. At the Contractor's option, the Contractor may continue to install the casing and remove the rock through the casing.

3.09 INSTALLATION OF PIPE

- A. After construction of the casing is complete, and has been accepted by the Engineer, install the pipeline in accordance with the Drawings and Specifications.
- B. Check the alignment and grade of the casing and prepare a plan to set the pipe at proper alignment, grade and elevation, without any sags or high spots.
- C. The carrier pipe shall be held in the casing pipe by one of the following methods:
 - 1. The carrier pipe shall be held in the casing pipe by the use of hardwood blocks spaced radially around the pipe and secured together so that they remain firmly in place. The spacing of such blocks longitudinally in the casing pipe shall not be greater than 10 feet.
 - 2. The pipe shall be supported within the casing by use of casing spacers sized to limit radial movement to a maximum of 1-inch. Provide a minimum of one casing spacer per nominal length of pipe. Casing spacers shall be attached to the pipe at maximum 18 to 20 foot intervals:
- D. Close the ends of the casing with 4-inch brick walls

3.10 SHEETING REMOVAL

Remove sheeting used for shoring from the shaft and off the job site. The removal of sheeting, shoring and bracing shall be done in such a manner as not to endanger or damage either new or existing structures, private or public properties and also to avoid cave-ins or sliding in the banks.

3.11 INTERSTATE RESTORATION

When boring and jacking operations encroach upon the right-of-ways of the federal interstate system, the Contractor shall restore all screening trees with seedlings of like species.

END OF SECTION

SECTION 6

REMOVING AND REPLACING PAVEMENT

PART 1 GENERAL

1.01 SCOPE

- A. 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 utilities and appurtenances.
- B. Existing pavement, sidewalks and curbs shall be replaced to the current County standards or to match existing, whichever is more stringent.

1.02 SUBMITTALS

If required by the County or Engineer, provide certificates stating that materials supplied comply with Specifications. Certificates shall be signed by the asphalt producer and the Contractor.

1.03 CONDITIONS

- A. Weather Limitations
 - 1. Apply bituminous tack coat 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 and rising.
- 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. Bituminous Tack Coat: The bituminous tack coat shall conform to the requirements of Section 400 of the Georgia Department of Transportation Standard Specifications.
- D. Surface Course: The surface course for all asphaltic concrete pavement shall conform to the requirements of Section 400, Type "E" 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 on the Drawings.
- F. Special Surfaces: Where driveways or roadways are disturbed or damaged which are constructed of specialty type surfaces, e.g., brick or stone, these driveways and roadways shall be restored utilizing similar, if not original, materials. Where the nature of these surfaces dictate, 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, Bituminous Tack Coat and Surface Course: Asphaltic concrete base, tack coat 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, 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 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. Gravel Surfaces: Existing gravel road, drive and parking area replacement shall meet the requirements of graded aggregate base course. This surfacing may be authorized by the Engineer as a temporary surface for paved streets until replacement of hard surfaced pavement is authorized.
- G. 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, as specified in Section 4 of these Specifications, 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 LOCATIONS FOR PAVEMENT REPLACEMENT

- A. Type I Pavement Replacement (see Detail No. G-4) shall be used for pavement replacement for:
 - 1. All point repairs;
 - 2. All trenches, longitudinal or crossing installations, less than 12-inches wide;
 - 3. All trenches for roadway crossings where the trench width at the top of the pipe is less than or equal to three feet, and the trench depth is less than or equal to eight feet.
 - 4. At Contractor's option, in lieu of Type II and Type III Pavement Replacement.
- B. Type II Pavement Replacement (see Detail No. G-5) shall be used for pavement replacement for:
 - 1. All trenches for roadway crossings which do not meet the criteria for Type I

Pavement Replacement;

2. All trench longitudinal installations which do not meet the criteria for Type III Pavement Replacement.
 3. At Contractor's option, in lieu of Type III Pavement Replacement.
- C. Type III Pavement Replacement (see Detail No. G-6) shall be used only for longitudinal installations and where the trench width at the top of the pipe is greater than four feet_
- D. "Graded Aggregate" pavement repair shall be used only where approved by the Engineer.

3.02 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.

3.03 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 approved by the Engineer. 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 in Section 4 of these Specifications.
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. This temporary surface shall be maintained carefully at grade and dust-free by the Contractor until the backfill of the trench has thoroughly compacted in the opinion of the Engineer and permission is granted to replace the street pavement.
4. When temporary crushed stone or chert surface is considered by the Engineer 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. Pavement cuts shall be parallel or perpendicular to the road centerline as much as practical. On parallel installations the final cut shall be long and straight and consistent.
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. Concrete base slabs and crushed stone bases, if required, shall be placed and allowed to cure for three days before bituminous concrete surface courses are applied. 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 or stone are disturbed or damaged, these driveways and roadways shall be restored utilizing similar materials. Where the nature of these surfaces dictate, 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.
- C. Pavement Resurfacing
1. Certain areas to be resurfaced are specified or noted on the Drawings. Where pavement to be resurfaced has been damaged with potholes, the Contractor shall remove all existing loose pavement material and fill the hole with black base, as specified, to the level of the existing pavement. After all pipe line installations are complete and existing pavement has been removed and replaced along the trench route, apply tack coat and surface course as specified.
 2. Resurfacing limits shall be perpendicular to the road centerline. The limits of resurfacing shall, at a minimum, be 10 feet beyond the edge of the pavement replacement on the main road being resurfaced, and to the point of tangency of the pavement on the side streets.
- 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.

3.04 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 M 59 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 indicated on the Drawings:
6. Wood forms may be used on sharp turns and for special sections, as approved by the Engineer. 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; if such joints do not exist, the cut shall be made at minimum distances shown on the Drawings.
 - 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 to match existing 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 of the radius indicated on the Drawings. .
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 Engineer.
2. Provide sidewalk ramp openings as indicated on the Drawings, in conformance with the applicable regulations and as directed by the Engineer.

- 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 like shall be repaired by the Contractor.

3.05 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.

3.06 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.

3.07 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 7 PUMPING STATION WATER SERVICE

PART 1 GENERAL

1.01 SCOPE

- A. The work covered by this Section includes furnishing all materials and equipment, providing all required labor and installing water service to a wastewater pumping station and all appurtenant work according to these Specifications and/or to the Drawings.
- B. Water meters are not to be furnished by the Contractor. However, the water meter connection must be compatible with the water meters currently used by the Owner.

1.02 LOCATIONS

Locations shall be as shown on the Drawings.

PART 2 PRODUCTS

2.01 MATERIALS AND CONSTRUCTION

- A. Polyvinyl Chloride (PVC) Pipe
 - 1. Pipe
 - a. All PVC pipe shall have integral belled ends for push-on type jointing and shall conform to ASTM D 2241.
 - b. Unless shown otherwise on the Drawings, pipe shall have a Standard Dimension Ratio (SDR) of 26 and shall be capable of withstanding a working pressure of 160 psi, unless indicated otherwise on the Drawings.
 - c. Pipe shall be supplied in minimum lengths of 20 feet.
 - 2. Acceptance will be on the basis of the Engineer's inspection and the manufacturer's written certification that the pipe was manufactured and tested in accordance with the applicable standards, including the National Sanitation Foundation. Additionally, each piece of pipe shall be stamped "NSF Approved".
- B. Meter Box
 - 1. Meter boxes shall be plastic. Material shall meet or exceed the following:
 - a. Tensile Strength: 3,400 psi (ASTM D 638).
 - b. Flexural Modulus: 191,000 psi (ASTM D 790).
 - c. Impact Strength, Izod: 0.6-feet 16/inch (ASTM D 256).
 - d. Deflection Temperatures: 200 degrees F (ASTM D 648).

2. Plastic meter boxes shall be equal to Ametek, Plymouth Products Division or Brooks Products, Inc.
 3. Meter box shall be fitted with cast iron cover
 4. Minimum dimensions shall be 10-3/4 x 16-inches top and 18-1/2 x 13-1/4-inches at bottom and 18-inches deep.
- C. Valves: Gate valves shall be bronze, heavy duty, rising stem, wedge type with screwed or union bonnet. Valve ends shall be threaded or solder type as appropriate. Valves shall have a minimum 200 psi working pressure for water (125 psi working pressure for steam). Valves shall be made in the U.S.A. Gate valves shall be equal to Crane No. 428 (threaded) or Crane No. 1334 (solder end).
- D. Corporation Cocks and Curb Stops
1. Corporation cocks and curb stops shall be ground key type, shall be made of bronze conforming to ASTM B 61 or B 62, and shall be suitable for the working pressure of the system. Ends shall be suitable for grip type joint. Threaded ends for inlet and outlet of corporation cocks shall conform to AWWA C800; coupling nut for connection to flared copper tubing shall conform to ANSI B16.26.
 2. Corporation cocks and curb stops shall be manufactured by Mueller or Ford.
- E. Service Clamps
1. Clamp body shall be of epoxy coated ductile iron.
 2. The strap shall have a minimum width of 3-1/4-inches and shall be made of epoxy coated stainless steel.
 3. Service clamps shall be equal to Ford FC 202
- F. Backflow Preventers, Reduced Pressure Zone Type (RPZ) (3/4 to 2-Inch Size)
1. Provide reduced pressure zone backflow preventers where noted on the Drawings. Backflow preventers shall be rated for operation with inlet water pressures up to 175 psig and water temperatures up to 140-1/2 degrees F. Backflow preventers shall be tested and certified in accordance with ASSE 1013 and AWWA C506 and C511
 2. Provide with bronze body construction, rubber check valve and relief valve assemblies, and Clecon check seats.
 3. Provide isolation valves on the inlet and outlet of each backflow preventer for maintenance. These valves shall be quarter turn, full port, resilient seated, bronze ball valves.
 4. Provide bronze ball body valve test cocks.
 5. Provide bronze body strainer on the inlet of each backflow preventer.
 6. Acceptable Manufacturers: Watts Series 909, Wilkins, Hersey.

- G. Post Hydrants: Post hydrants shall be non-freeze design, bronze exposed head with aluminum casing guard and bronze casing. Minimum depth of bury shall be two feet. Post hydrants shall be equal to Zurn Z-1385.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Connections to Water Mains
 - 1. Connections to ductile iron pipe water mains. shall be by the direct tap method or service clamp, as detailed on the Drawings in full accordance with AWWA requirements.
 - 2. Connections to polyvinyl chloride pipe water mains shall be made using a full body service clamp.
 - 3. Pressure ratings shall be as required for the installation.
- B. Water Service Connections
 - 1. Water service connections installed under roadway shall be pulled through a bored hole approximately equal in diameter to the external diameter of the service line. No casing will be required. Minimum cover under roadway shall be four feet. At other locations minimum cover shall be two feet.
 - 2. Installation shall conform to the details for water service connections appearing schematically on the Drawings. Contractor shall provide any and all appurtenant work required to provide the intended water service connections.
- C. Permanent Water Services
 - 1. Each new service line shall be tapped into the main through a corporation stop, utilizing a service clamp, as detailed on the Drawings. A new service line shall be provided to the meter as shown on the Drawings.
 - 2. A corporation cock shall be provided in the water main for each service line.
 - 3. A curb stop shall be provided at each existing or future water meter location.
- D. Backflow preventers shall be provided on all water services.

END OF SECTION

SECTION 8 SEWERS AND ACCESSORIES

PART 1 GENERAL

1.01 SCOPE

- A. This Section describes products to be incorporated into sewers and accessories and requirements for the installation and use of these items. Furnish all products and perform all labor necessary to fulfill the requirements of these Specifications.
- B. General: Supply all products and perform all work in accordance with applicable American Society for Testing and Material (ASTM), American Water Works Association (AWWA), American National Standards Institute (ANSI), or other recognized standards. Latest revisions of all standards are applicable.

1.02 QUALIFICATIONS

If requested by the Engineer, submit evidence that manufacturers have consistently produced products of satisfactory quality and performance for a period of at least two years.

1.03 SUBMITTALS

If required by the County or Engineer, complete shop drawings, product data and engineering data, including shop drawings, shall be submitted to the Engineer.

1.04 TRANSPORTATION AND HANDLING

- A. Unloading: Furnish equipment and facilities for unloading, handling, distributing and storing pipe, fittings, valves and accessories. Make equipment available at all times for use in unloading. Do not drop or dump materials. Any materials dropped or dumped will be subject to rejection without additional justification.
- B. Handling: Handle pipe, fittings, valves and accessories carefully to prevent shock or damage. Handle pipe by rolling on skids, forklift, or front loader. Do not use material damaged in handling.
- C. Lined pipe shall be handled and transported to prevent damage to linings.

1.05 STORAGE AND PROTECTION

- A. Store all pipe which cannot be distributed along the route. Make arrangements for the use of suitable storage areas.
- B. Stored materials shall be kept safe from damage. The interior of all pipe, fittings and other appurtenances shall be kept free from dirt or foreign matter at all times.
- C. Pipe shall not be stacked higher than the limits recommended by the manufacturer. The bottom tier shall be kept off the ground on timbers, rails or concrete. Pipe in tiers shall be alternated: bell, plain end; bell, plain end. At least two rows of timbers shall be placed between tiers and chocks, affixed to each other in order to prevent movement.

The timbers shall be large enough to prevent contact between the pipe in adjacent tiers.

- D. Store joint gaskets in a cool location, out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.

1.06 QUALITY ASSURANCE

- A. Product manufacturers shall provide the Engineer with written certification that all products furnished comply with all applicable provisions of these Specifications.
- B. If ordered by the Engineer, each pipe manufacturer shall furnish the services of a competent factory representative to supervise and/or inspect the installation of pipe. This service will be furnished for a minimum of five days during initial pipe installation.

PART 2 PRODUCTS

2.01 DUCTILE IRON PIPE (DIP)

- A. Ductile iron pipe shall be utilized where shown on the Drawings. All pipe, except specials, shall be furnished in nominal lengths of 18 to 20 feet, with a bituminous outside coating.
- B. Ductile iron pipe shall be manufactured 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
16 - 24	250

- C. Fittings and Accessories
- Fittings shall be ductile iron and shall conform to AWWA C110/ANSI A21.10 or AWWA C153/ANSI A21.53 with a minimum rated working pressure of 250 psi, and shall be furnished with a bituminous outside coating.
 - Thrust Collars: Thrust collars shall be welded-on ductile iron body type capable of withstanding a thrust due to 250 psi internal pressure on a dead end from either direction on that pipe size. Weld-on collars shall be continuously welded to the pipe by the pipe manufacturer.
 - Solid Sleeves: Solid sleeves shall permit the connection of plain end ductile iron pipe and plain end PVC pipe. Solid sleeves shall meet the requirements of ANSI/AWWA C110 for long pattern and have a minimum pressure rating of 250 psi. Solid sleeves shall have a mechanical or restrained joint as specified in this Section and as shown on the Drawings. Solid sleeves shall be provided with

gaskets suitable for the type of pipe to be connected. Solid sleeves shall be used only in locations shown on the Drawings or at the direction of the Engineer. Solid sleeves shall be manufactured by ACIPCO, U.S. Pipe or McWane (Clow).

D. Joints for Ductile Iron Pipe and Fittings

1. General

- a. Joints for ductile iron pipe and fittings shall be mechanical joint, flanged joint, ball joint, restrained joint, or push-on joint as shown on the Drawings or specified herein.
- b. Unless otherwise shown on the Drawings, specified or directed, all ductile iron pipe laid underground shall be joined_ using push-on type joints.
- c. In all cases, gaskets shall be made of material that will not be damaged by the fluid being transported nor by the environment in which the pipe is installed.
- d. Provide the necessary bolts for connections. All bolts and nuts shall be threaded in accordance with ANSI 131. 1, Coarse Thread Series, Class 2A external and 213 internal fit. All bolts and nuts shall be made in the U.S.A.

2. Mechanical Joints

- a. Joints shall conform to AWWA C111/ANSI A21.11.
- b. Bolts and nuts shall be Tee Head Bolts and nuts of high strength low-alloy steel in accordance with ASTM A 242 to the dimensions shown in AWWA C111/ANSI A21.11.
- c. Gaskets shall be in accordance with AWWA Ci11/ANSI A21.11 and shall be constructed of plain rubber.
- d. Mechanical joint glands shall be ductile iron:

3. Push-On Joints: Push-on joints and gaskets shall_ conform to AWWA C111/ANSI A21.11. Details of the joint design shall be in accordance with the manufacturer's standard practice such as ACIPCO "Fastite", McWane (Clow) "Bell-Tite", or U.S. Pipe "Tyton" joints.

4. Flanged Joints

- a. Flanged joints shall conform to AWWA C115/ANSI A21.15. Flanges shall be ductile iron and shall be furnished by the pipe manufacturer.
- b. Gaskets shall be made of 1/8-inch thick, cloth reinforced rubber. Gaskets may be ring type or full face type.
- c. Flanged ductile iron pipe shall have flanges cast solidly or threaded to the pipe barrel. Pipe threads shall be of such length that with flanges screwed home, the end of the pipe shall project beyond the face line of the flange. Flange and pipe shall then be machined to give a flush finish to the pipe and the flange and surface shall be normal to the axis of the pipe. Ductile iron

flanges shall be of such design that the flange neck completely covers the threaded portion of the pipe to protect same against corrosion. All pipe with threaded type flanges shall be assembled, faced, and drilled at the point of manufacture, unless otherwise approved by the Engineer.

- d. Flange filler shall conform to AWWA C 110/ANSI A21.10. Joint bolt length shall be increased by the thickness of the flange filler.
 - e. Where tap or stud bolts are required, flanges shall be drilled and tapped accordingly.
 - f. Bolt length and diameter shall conform to ANSI/AWWA C115 for Class 125 flanges shown in ANSI/ASME B16.1.
 - g. Bolts for exposed service shall be zinc plated, cold pressed, steel machine bolts conforming to ASTM A 307, Grade B. Nuts for exposed service shall be zinc plated, heavy hex conforming to ASTM A 563. Zinc plating shall conform to ASTM B 633, Type II.
 - h. Bolts for submerged service shall be stainless steel machine bolts conforming to ASTM A 193, Grade B8. Nuts shall be heavy hex, stainless steel conforming to ASTM A 194, Grade 8.
5. Restrained Joints
- a. Restrained joints shall be ACIPCO "FLEX-RING" or "FAST-GRIP", or U.S. "TR-FLEX" or "FIELD LOK"
 - b. Bolts and nuts shall be in accordance with the manufacturer's recommendations.
 - c. Gaskets shall be in accordance with the manufacturer's recommendations.
- E. Cement Linings: Pipe and fittings shall be cement lined in accordance with AWWA C 104/ANSI/AWWA C 104/A21.4. Seal coat is not required.
- F. Polyethylene Encasement: Where shown on the Drawings, ductile iron pipe shall be encased with polyethylene film.

2.02 POLYVINYL CHLORIDE (PVC) GRAVITY SEWER PIPE

- A. Applicable requirements of PVC pipe for gravity sewers, by pipe diameter, is indicated in the following table:

Standard Minimum Thickness Type PVC	Wall	< 6	8 to 15	18	21	24
ASTM D 3034, SDR 35, 12454B	Sw	Yes	Yes	No	No	No
ASTM F 679, T-1, 12454C	Sw	No	No	Yes	Yes	Yes

• As specified in ASTM D 1784

SW Solid Wall

- B. All pipe shall have a minimum pipe stiffness of 46 psi at five percent deflection as determined by ASTM D 2412.

- C. PVC gravity sewer pipe shall be supplied in lengths not longer than 13 feet.
- D. Each length of pipe shall be marked with the manufacturer's name, trade name, nominal size, class, hydrostatic test pressure, manufacturer's standard symbol to signify it was tested, and date of manufacture. Each rubber ring shall be marked with the manufacturer's identification, the size, the year of manufacture, and the classes of pipe with which it can be used.
- E. Fittings 15 inches in diameter and less shall be manufactured in accordance with ASTM D 3034. PVC compound shall be 12454B or 12454C as specified in ASTM D1784.
 - 1. For sizes 8-inches and less in diameter, fittings shall be molded in one-piece with no solvent welded joints. Minimum socket depths shall be as specified in ASTM D 3034, Table 2.
 - 2. For sizes 10-inches and larger in diameter, fittings shall be fabricated from pipe conforming to ASTM D 3034 using solvent welding. No field fabrication of fittings will be allowed. All such fabrication shall be performed at the factory and the fittings shall be delivered ready for use.
- F. Joints: Joints for pipe and fittings shall be of the integral bell and spigot type with a confined elastomeric gasket having the capability of absorbing expansion and contraction without leakage, when tested in accordance with ASTM D 3212. Gaskets shall meet the requirements of ASTM F 477. The joint system shall be subject to the approval of the Engineer and shall be identical for pipe and fittings.
- G. Manhole Connections: The sewer shall be connected to manholes utilizing a standard pipe section.
- H. Acceptance: Acceptance will be on the basis of the Engineer's inspection and the manufacturer's written certification that the pipe and fittings were manufactured and tested in accordance with the applicable standards.

2.03 MANHOLES AND PRECAST CONCRETE PRODUCTS

- A. Provide manholes and other precast concrete products, including pumping station wetwell and valve vault, in accordance with the following paragraphs.
- B. Precast Concrete Sections
 - 1. Precast concrete sections shall meet the requirements of ASTM C 478. The minimum compressive strength of the concrete in precast sections shall be 4,000 psi. The minimum wall thickness shall be one-twelfth of the inside diameter of the base, riser or the largest cone diameter. Additionally, the wall thickness shall be sufficient for the proper installation of the rubber boots.
 - 2. Transition slabs which convert bases larger than four feet in diameter to four foot diameter risers shall be designed by the manhole manufacturer to carry the live and dead loads exerted on the slab.
 - 3. Seal joints between precast sections by means of rubber O-ring gaskets or

flexible butyl rubber sealant. Butyl rubber sealants shall meet the requirements of AASHTO M-198. Sealant shall be pre-formed type with a minimum nominal diameter of 1-inch. Butyl rubber sealant shall be equal to Kent Seal No. 2 or Concrete Sealants CS202.

- C. Brick and Mortar: Brick shall be whole and hardburned, conforming to ASTM C 32 Grade MS. Mortar shall be made of one part Portland cement and two parts clean sharp sand. Cement shall be Type 1 and shall conform to ASTM C 150. Sand shall meet ASTM C 144.
- D. Iron Castings
 - 1. Cast iron manhole frames and covers shall meet the requirements of ASTM A 48 for Class 30 gray iron and all applicable local standards. All castings shall be tough, close grained, smooth and free from blow holes, blisters, shrinkage, strains, cracks, cold shots and other imperfections. No casting will be accepted which weighs less than 95 percent of the design weight. Shop drawings must indicate the design weight and provide sufficient dimensions to permit checking.
 - 2. Manhole frames and covers shall be as shown on the Standard Detail Drawings.
 - 3. All frames and covers shall have machined horizontal bearing surfaces.
 - 4. All manholes shall have standard frames and covers except where specifically shown otherwise on the Drawings.
 - 5. The words "BARROW COUNTY SEWER" shall be cast in all manhole covers in raised letters minimum 2-inches in height.
- E. Rubber Boots: Provide preformed rubber boots and fasteners equal to those manufactured by Kor-N-Seal or Press Seal Gasket Corporation.
- F. Steps: Manhole steps of polypropylene molded around a steel rod equal to products of M.A. Industries shall be used. Manhole steps shall meet the requirements of ASTM C 478 for design, materials of construction, dimensions, testing and acceptance.
- G. Aluminum Floor Doors
 - 1. Door shall be a single or double leaf type as shown on the Drawings built to withstand 150 pounds per square foot.
 - 2. The frame shall be 1/4-inch extruded aluminum with built-in neoprene cushion and with strap anchors bolted to the exterior. Door leaf shall be 1/4-inch aluminum diamond plate reinforced with aluminum stiffeners as required. Stainless steel hinges shall be bolted to the underside and pivot on torsion bars that counterbalance the door for easy operation. The door shall open to 90 degrees and lock automatically in that position. A vinyl grip handle shall be provided to release the cover for closing. Doors shall be equipped with a snap lock and removable handle. Bituminous coating shall be applied to the exterior of the frame by the manufacturer. All hardware shall be stainless steel.
 - 3. Door shall be Type K, manufactured by The Bilco Company.

H. Sand-Cement Grout

1. Column baseplates, pipe support baseplates, tanks and miscellaneous small items of equipment shall be grouted in place using a sand-cement grout consisting of one part Portland cement, two parts fine aggregate and a maximum of 4.5 gallons of water per sack (cubic foot) of cement. Portland cement shall be Type III conforming to ASTM C 150. Fine aggregate shall be natural siliceous sand, consisting of hard, clean, sharp, dense, durable and uncoated particles.
2. Fine aggregate shall be free from organic material and injurious amounts of deleterious substances and shall be graded as follows:

Sieve Size No.	Percent (by weight) Passing
4	100
8	95-100
16	60- 100
30	35 - 70
50	15 - 35
100	2 - 15

3. Except as modified herein, fine aggregate shall conform to the requirements of ASTM C 144.
 4. Fine aggregate to be used with epoxy binders shall be dried prior to use to remove any free moisture.
- I. Non-Shrink Grout: All pumps and other heavy equipment items shall be grouted in place with a nonmetallic, noncorrosive, nongaseous, nonshrink grout requiring no cutback or protective coating. Nonshrink grout shall show zero shrinkage from the placement volume or initial expansion volume as determined by ASTM C 827, and shall have an initial set time at 70 degrees F of not less than 45 minutes as determined by ASTM C 191. When tested in accordance with ASTM C 109, nonshrink grout shall have a one-day compressive strength of not less than 2,000 psi and a 28-day compressive strength of not less than 9,000 psi at a flow of not less than 100 percent determined in accordance with Corps of Engineers Specification CRD-C-621. The grout shall contain no corrosive ions, calcium chloride, oxidizing catalysts, gas-forming agents, harmful aluminums or corrosive chemicals and shall be resistant to oil, water and sewage. The grout shall be premixed and shall require only the addition of water prior to placement. The grout shall be delivered to the job site in unopened, plastic-lined bags and shall have the manufacturer's mixing instructions printed on the back of each bag. Nonshrink grout shall be EUCO N-S Grout as manufactured by the Euclid Chemical Company, Masterflow 713 Grout as manufactured by Master Builders Company, or Upcon High Flow Grout as manufactured by UPCO Division of Emhart Chemical Company.

2.04 MISCELLANEOUS ACCESSORIES

A. Flexible Adapter Couplings

1. Couplings for pipe sizes 15-inches in diameter and less shall be elastomeric plastic sleeves designed to connect pipes of dissimilar materials. Adapters shall provide a positive seal against infiltration and exfiltration and remain leakproof and rootproof up to 4.3 psi. The adapter manufacturer shall provide all stainless steel clamps and required accessories.
2. Couplings shall be products of Fernco and shall be installed in accordance with the manufacturer's recommendations.

B. Flexible Adapter Donuts

1. Adapter donuts shall be elastomeric polyvinyl chloride (PVC), compressible seals designed for sealing joints between sewer pipes of different sizes and/or dissimilar materials. Adapters shall provide a positive seal against infiltration and exfiltration and remain leakproof and rootproof up to 4.3 psi.
2. Donuts shall be products of Fernco and shall be installed in accordance with the manufacturer's recommendations.

2.05 DETECTION TAPE

Detection tape shall be composed of a solid aluminum foil encased in a protective plastic jacket. Tapes shall be color coded in accordance with APWA color codes with the following legends: Sanitary Sewerage Systems, Safety Green, "Caution: Sewer Line Buried Below". Colors may be solid or striped. Tape shall be permanently printed with no surface printing allowed. Tape width shall be minimum 2-inches when buried less than 10-inches below the surface. Tape width shall be minimum 3-inches when buried greater than 10-inches and less than 20-inches. Detection tape shall be equal to Lineguard Type III Detectable or Allen Systems Detectatape.

PART 3 EXECUTION

3.01 EXISTING UTILITIES AND OBSTRUCTIONS

- A. The Drawings indicate utilities or obstructions that are known to exist according to the best informatipn available to the Owner. The Contractor shall call the Utilities Protection Center (UPC) (325-5000 or 1-800-282-7411) as required by Georgia law (O.C.G.A. §§ 25-9-1 through 25-9-13) and all utilities, agencies or departments that own and/or operate utilities in the vicinity of the construction work site, at least 72 hours (three business days) prior to construction, to verify the location of the existing utilities.
- B. Existing Utility Location: The following steps shall be exercised to avoid interruption of existing utility service.
 1. Provide the required notice to the utility, owners and allow them to locate their facilities according to Georgia law. Field utility locations are valid for only 10 days

after original notice. The Contractor shall ensure, at the time of any excavation, that a valid utility location exists at the point of excavation.

2. Expose the facility to verify its true location and grade for a distance of at least 200 feet in advance of pipeline construction to verify its true location and grade. Repair, or have repaired, any damage to utilities resulting from locating or exposing their true location.
3. Avoid utility damage and interruption by protecting it with means or methods recommended by the utility owner.
4. Maintain a log identifying when phone calls were made, who was called, area for which utility relocation was requested and work order number issued, if any,

C. Conflict with Existing Utilities

1. Horizontal Conflict: Horizontal conflict shall be defined as when the actual horizontal separation between a utility, main, or service and the proposed water main does not permit safe installation of the sewer by the use of sheeting, shoring, tying-back, supporting, or temporarily suspending service of the parallel or crossing facility. The Contractor may change the proposed alignment of the sewer to avoid horizontal conflicts if the new alignment remains within the available right-of-way or easement and complies with regulatory agency requirements after a written request to and subsequent approval by the Engineer. If, in the opinion of the Engineer, the sewer's proposed location cannot be adjusted, thus requiring the relocation of an existing utility, the Owner will direct the Contractor to have the utility relocated.
2. Vertical Conflict: Vertical conflict shall be defined as when the actual vertical separation between a utility, main, or service and the proposed sewer does not permit the crossing without immediate or potential future damage to the utility, main, service, or the sewer. The Contractor may change the proposed grade of the sewer to avoid vertical conflicts if the changed grade provides minimum required capacity, maintains adequate cover and complies with regulatory agencies requirements, after written request to and subsequent approval by the Engineer. If, in the opinion of the Engineer, the sewer's proposed location cannot be adjusted, thus requiring the relocation of an existing utility, the Owner will direct the Contractor to have the utility relocated.

D. Electronic Locator: Have available at all times an electronic pipe locator and a magnetic locator, in good working order, to aid in locating existing pipe lines or other obstructions.

E. Water and Sewer Separation

1. Sewers should maintain a minimum 10 foot edge-to-edge separation from water mains. Where the sewer crosses over or under a water main, an 18-inch vertical separation shall be maintained where possible. Where possible, a full length of sewer pipe shall be centered on the water main. Any deviation shall be requested

in writing to the Engineer.

2. Where the sewer crosses over a water main, the water main shall be encased in concrete to the first joint in each direction.
3. No water main shall be permitted to pass through or come in contact with any part of a manhole.

3.02 CONSTRUCTION ALONG HIGHWAYS, STREETS AND ROADWAYS

- A. Install pipe lines and appurtenances along highways, streets and roadways in accordance with the applicable regulations of, and permits issued by, the Georgia Department of Transportation and Barrow County with reference to construction operations, safety, traffic control, road maintenance and repair.
- B. Traffic Control
 1. The Contractor shall provide, erect and maintain all necessary barricades; suitable and sufficient lights and other traffic control devices; provide qualified flagmen where necessary to direct traffic; take all necessary precautions for the protection of the work and the safety of the public.
 2. Construction traffic control devices and their installation shall be in accordance with the current U.S. DOT Manual On Uniform Traffic Control Devices for Streets and Highways Section 104.05 and 107.07, and the Georgia Department of Transportation Standard Specification Section 107.09.
 3. Placement and removal of construction traffic control devices shall be coordinated with the Georgia Department of Transportation and Barrow County a minimum of 48 hours in advance of the activity.
 4. Placement of construction traffic control devices shall be scheduled ahead of associated construction activities. Construction time in street right-of-way shall be conducted to minimize the length of time traffic is disrupted. Construction traffic control devices shall be removed immediately following their useful purpose. Traffic control devices used intermittently, such as "Flagmen- Ahead", shall be removed and replaced when needed.
 5. Existing traffic control devices within the construction work zone shall be protected from damage. Traffic control devices requiring temporary relocation shall be located as near as possible to their original vertical and horizontal locations. Original locations shall be measured from reference points and recorded in a log prior to relocation. Temporary locations shall provide the same visibility to affected traffic as the original location. Relocated traffic control devices shall be reinstalled in their original locations as soon as practical following construction.
 6. Construction traffic control devices shall be maintained in good repair, and shall be clean and visible to affected traffic for daytime and nighttime operation.

Traffic control devices affected by the construction work zone shall be inspected daily.

7. Construction warning signs shall be black legend on an orange background. Regulatory signs shall be black legend on a white background. Construction sign panels shall meet the minimum reflective requirements of the Georgia Department of Transportation and Barrow County. Sign panels shall be of durable materials capable of maintaining their color, reflective character and legibility during the period of construction.
8. Channelization devices shall be positioned preceding an obstruction at a taper length as required by the current Manual On Uniform Traffic Control Devices for Streets and Highways, as appropriate for the speed limit at that location. Channelization devices shall be patrolled to insure that they are maintained in the proper position throughout their period of use.

C. Construction Operations

1. Perform all work along highways, streets and roadways to minimize interference with traffic.
2. Stripping: Where the pipe line is laid along road right-of-way, strip and stockpile all sod, topsoil and other material suitable for right-of-way restoration.
3. Trenching, Laying and Backfilling: Do not open the trench any further ahead of pipe laying operations than is necessary. Backfill and remove excess material immediately behind laying operations. Complete excavation and backfill for any portion of the trench in the same day.
4. Shaping: Reshape damaged slopes, side ditches, and ditch lines immediately after completing backfilling operations. Replace topsoil, sod and any other materials removed from shoulders,

D. Excavated Materials: Do not place excavated material along highways, streets and roadways in a manner which obstructs traffic. Sweep all scattered excavated material off the pavement in a timely manner.

E. Drainage Structures: Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.

F. Landscaping Features: Landscaping features shall include, but are not necessarily limited to: fences; property corners; cultivated trees and shrubbery; manmade improvements; subdivision and other signs within the right-of-way and easement. The Contractor shall take extreme care in moving landscape features and promptly re-establishing these features.

G. Maintaining Highways, Streets, Roadways and Driveways

1. Maintain streets, highways, roadways and driveways in suitable condition for

movement of traffic until completion and final acceptance of the work.

2. During the time period between pavement removal and completing permanent pavement replacement, maintain highways, streets and roadways by the use of steel running plates. The edges of running plates shall have asphalt placed around their periphery to minimize vehicular impact. The backfill above the pipe shall be compacted, as specified elsewhere up to the existing pavement surface to provide support for the steel running plates.
3. Furnish a road grader or front-end loader for maintaining highways, streets, and roadways. Make the grader or front-end loader available at all times.
4. Immediately repair all driveways that are cut or damaged. Maintain them in a suitable condition for use until completion and final acceptance of the work.

3.03 PIPE DISTRIBUTION

- A. Pipe shall be distributed and placed in such a manner that will not interfere with traffic.
- B. No pipe shall be strung further along the route than 1,000 feet beyond the area in which the Contractor is actually working without written permission from the Owner. The Owner reserves the right to reduce this distance to a maximum distance of 200 feet in residential and commercial areas based on the effects of the distribution to the adjacent property owners.
- C. No street or roadway may be closed for unloading of pipe without first obtaining permission from the proper authorities. The Contractor shall furnish and maintain proper warning signs and obstruction lights for the protection of traffic along highways, streets and roadways upon which pipe is distributed.
- D. No distributed pipe shall be placed inside drainage ditches.
- E. Distributed pipe shall be placed as far as possible from the roadway pavement, but no closer than five feet from the roadway pavement, as measured edge-to-edge.

3.04 LOCATION AND GRADE

- A. The Drawings show the alignment and grade of the gravity sewer and the position of manholes and other appurtenances. The slope shown on the gravity sewer profile and/or called for in the Specifications is the slope of the invert of the pipe.
- B. After the Contractor locates and marks the manhole centerlines or baselines of the gravity sewer, the Contractor shall perform clearing and grubbing.
- C. Where the depth of cover of the gravity sewer is less than four feet, the sewer shall be constructed with ductile iron pipe.

3.05 LAYING AND JOINTING PIPE AND ACCESSORIES

- A. Lay all pipe and fittings to accurately conform to the lines and grades established by the Engineer.

B. Pipe Installation

1. Proper implements, tools and facilities shall be provided for the safe performance of the Work. All pipe, fittings and valves shall be lowered carefully into the trench by means of slings, ropes or other suitable tools or equipment in such a manner as to prevent damage to sewer materials and protective coatings and linings. Under no circumstances shall sewer materials be dropped or dumped into the trench.
2. All pipe, fittings, valves and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the Engineer, who may prescribe corrective repairs or reject the materials.
3. All lumps, blisters and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and free from dirt, sand, grit or any foreign materials before the pipe is laid. No pipe which contains dirt shall be laid.
4. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing or other materials shall be placed in the pipe at any time,
5. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.
6. It is common practice to lay pipe with the bells facing the direction in which work is progressing.
7. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade shall not be permitted.
8. Polyethylene Encasement: Installation shall be in accordance with AWWA C 105 and the manufacturer's instructions. All ends shall be securely closed with tape and all damaged areas shall be completely repaired to the satisfaction of the Engineer.

C. Alignment and Gradient

1. Lay pipe straight in alignment and gradient.
2. Maintain a transit, level and accessories on the job to lay out angles.
3. The Contractor shall check the invert elevation at each manhole and the gravity sewer invert elevation at least three times daily, start, mid-day and end of day. Elevations shall be checked more frequently if more than 100 feet of pipe is installed in a day or if the gravity sewer is being constructed at minimum slope.
4. The Contractor shall check the horizontal alignment of the gravity sewer at the same schedule as for invert elevations.

- D. Expediting of Work: Excavate, lay the pipe, and backfill as closely together as possible. Do not leave unjointed pipe in the trench overnight. Backfill and compact the trench as soon as possible after laying and jointing is completed. Cover the exposed end of the installed pipe each day at the close of work and at all other times when work is not in progress. If necessary to backfill over the end of an uncompleted pipe or accessory, close the end with a suitable plug, either push-on mechanical joint, restrained joint or as approved by the Engineer.
- E. Joint Assembly: Push-on, mechanical, flange and restrained type joints shall be assembled in accordance with the manufacturer's recommendations.
- F. Cutting Pipe
 - 1. Cut ductile iron pipe using an abrasive wheel saw.
 - 2. Cut PVC pipe using a suitable saw.
 - 3. Remove all burrs and smooth the end before jointing.
 - 4. The Contractor shall cut the pipe and bevel the end, as necessary, to provide the correct length of pipe necessary for installing the fittings, valves, accessories and closure pieces in the correct location. Only push-on or mechanical joint pipe shall be cut.
- G. House Connections: Install wyes or tees in locations designated by the Engineer for future connection of service lines. Plug the branch of the wye or tee. Record the location of fittings installed on the Record Drawings.
- H. Provide detection tape for all buried sewers. Detection tape shall be buried 4 to 10-inches deep. Should detection tape need to be installed deeper, the Contractor shall provide 3-inch wide tape. In no case shall detection tape be buried greater than 20-inches from the finish grade surface.

3.06 MANHOLE AND PRECAST CONCRETE PRODUCT CONSTRUCTION

- A. Construct manholes as shown on the Standard Detail Drawings.
- B. Precast Concrete: Handle sections carefully to prevent cracking or chipping. Provide uniform bedding of the bottom section to prevent uneven loading. Install gaskets and joint sealants in accordance with manufacturer's recommendations to produce a watertight structure.
- C. Brick: Bed the bottom and sides of every brick in mortar. Apply a smooth coat of mortar, 3/4-inch thick, on the inside and outside.
- D. Inverts: Form channels as shown on the Drawings, rounded, and troweled smooth. Maintain consistent grade through the invert. Use sand-cement grout.
- E. Top Elevations: Build manholes outside of paved areas to 18-inches above finished grade unless otherwise shown on the Drawings or directed by the Engineer. Build manholes in paved areas to existing grades.
- F. Inside Drop Connections: Drop connections inside a manhole shall not exceed a

height of two pipe diameters plus 12 inches or greater above the outgoing pipe. Construct inside drop connections of the same materials as the upstream sewer and in accordance with the details shown on the Drawings.

- G. Outside Drop Connections: Manholes requiring outside drop connections are shown on the Drawings. Outside drop connections are required for any drop exceeding a height of two pipe diameters plus 12 inches or greater above the outgoing pipe. Construct outside drop connections of the same materials as the upstream sewer and in accordance with the details shown on the Drawings.
- H. Frames and Covers: Unless frame and cover is at grade, the frame shall be cast into the cone section.
- I. Seal all manhole joints and lift holes, both inside and out, with grout. Between precast sections, this is in addition to joint sealant.
- J. Invert Elevations: A minimum 0.20 foot drop between the Invert In and the Invert Out is required. The Drawings shall specify the Invert In and the Invert Out for each manhole. Prior to setting the laser or other vertical alignment control system for the sewer upstream of the manhole, the Contractor shall verify the elevation of the sewer installed at the manhole.
- K. Manholes shall be constructed such that their walls are plumb.
- L. Floor doors shall be integrally cast into the top slab, and shall be cast into the concrete in accordance with the manufacturer's recommendations.

3.07 CONCRETE COLLARS

Construct collars as shown on the Drawings.

3.08 INSPECTION AND TESTING

- A. Sewers and appurtenances shall be inspected and tested for:
 - 1. Cleanliness
 - 2. Alignment
 - 3. Watertightness
 - 4. Deflection
- B. Cleanliness: Sewers and manholes shall be inspected for cleanliness by means of direct visual observation or by the use of mirrors, with sunlight or other light source. Sewers and manholes shall be free of all debris and obstructions. Sediment in bottom of sewer shall not exceed 0.25 inch in depth. Flush sewers and manholes where sediment exceeds this limit.
- C. Alignment: Sewers shall be inspected for vertical and horizontal alignment by means of direct visual observation or by the use of mirrors, with sunlight or other light source. Sewers shall be straight in alignment, including no sags in the vertical alignment. Correct any misalignments discovered during inspection.

- D. Watertightness: All sewers constructed shall be tested for watertightness to the maximum extent feasible. Infiltration and exfiltration tests shall be performed on all new sewers constructed as indicated below, except for those new sewers constructed which have active services tied into it as the pipe is being installed. In such cases the watertightness of the sewers shall be based on a visual inspection. All visible or audible leaks, including those found via television inspection, shall be repaired. The following methods are required to ensure the watertightness of the sewer system:
- E. Video Inspection
1. Contractor shall provide, at his expense, a video of each segment of gravity sewer to be conducted by a person qualified in use of wastewater video equipment and technology.
 2. The County Sewer Inspector shall be notified a minimum of 24 hours in advance of the scheduled procedure.
 3. The video shall record the footage as the camera progresses through the sewer pipe. The location of each lateral shall clearly be shown on the video by both lot number and linear footage from the manhole.
 4. The operator of the camera shall stop at each service connection and rotate the camera to view the inside of each service connection for noticeable defects, debris, and cleanliness.
 5. An electronic copy of the video must be provided to the County before the sewer system can be accepted by the County.
 6. A field report of the video inspection must be submitted to County and shall include the following:
 - a. A diagram for each gravity sewer segment between manholes on a separate 8 ½ x 11 sheet.
 - b. The direction of flow for that segment of pipe.
 - c. The linear footage to each sewer lateral as measured from the same referenced manhole.
- F. Exfiltration Tests - Low-Pressure Air Test:
1. Sewers shall be subjected to a low-pressure air test in accordance with ASTM F 1417 and these Specifications. Prior to air testing, the section of sewer between manholes shall be thoroughly cleaned and wetted. Immediately after cleaning or while the pipe is water soaked, the sewer shall be tested with low-pressure air. At the Contractor's option, sewers may be tested in lengths between manholes or in short sections (25 feet or less) using inflatable balls pulled through the line from manhole to manhole. Air shall be slowly supplied to the plugged sewer section until internal air pressure reaches approximately 4.0 psi. After this pressure is reached and the pressure allowed to stabilize (approximately two to five minutes), the pressure may be reduced to 3.5 psi before starting the test. If a

1.0 psi drop does not occur within the test time, then the line has passed the test. If the pressure drops more than 1.0 psi during the test time, the line is presumed to have failed the test, and the Contractor will be required to locate the failure, make necessary repairs, and retest the line. Minimum test time for various pipe sizes and types is as follows:

Nominal Pipe Size, inches	Time (Min/100 feet) DIP, PVC
6	5.7
8	7.6
10	9.4
12	11.3
15	14.2
18	17.0
21	19.8
24	22.8

2. Required test equipment, including inflatable balls, braces, air hose, air source, timer, rotameter as applicable, cut-off valves, pressure reducing valve, 0-15 psi pressure gauge, 0-5 psi pressure gauge with gradations in 0.1 psi and accuracy of \pm two percent, shall be provided by the Contractor. Testing equipment shall be equal to Cherne Air-Loc Testing Systems.
 3. The County shall witness and the Contractor shall keep records of all tests made. Copy of such records will be given, to the Engineer or the County. Such records shall show date, line number and stations, operator, and such other pertinent information as required by the Engineer.
 4. The Contractor is cautioned to observe proper safety precautions in performance of the air testing. It is imperative that plugs be properly secured and that care be exercised in their removal. Every precaution shall be taken to avoid the possibility of over-pressurizing the sewer line.
- G. Deflection Test: All polyvinyl chloride pipe gravity sewers.
1. Test PVC gravity sewer for excessive deflection by passing a mandrel through the pipe. Deflection of the pipe shall not exceed five percent.
 2. The mandrel shall have an odd number of legs, or vanes, with a quantity of such equal to or greater than nine. The legs of the mandrel shall be permanently attached to the mandrel. A mandrel with variable sizes shall not be allowed. The mandrel shall be constructed of steel, aluminum or other material approved by the Engineer, and shall have sufficient rigidity so the legs of the mandrel will not deform when pulling through a pipe. The mandrel dimensions shall be checked by the Engineer before use by the Contractor.

Nominal Pipe Size, inches	Minimum Mandrel Diameter, inches
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6	5.46
8	7.28
10	9.09
12	10.79
15	13.20
18	16.13
21	19.00
24	21.36

* equal to 95% of base inside diameter as specified in the appendices of ASTM D3034 and F679.

3. General Procedure:

- a. Flush the sewer to remove any mud or trash.
- b. During the final flushing of the sewer, attach a floating block or ball to the end of the mandrell pull rope and float the rope through the sewer.
- c. After the rope is threaded through the sewer, connect the pull rope to the mandrell and place the mandrell in the entrance of the sewer segment.
- d. Connect a second rope to the back of the mandrell in order to enable the mandrell to be retrieved if excessive deflection is encountered.
- e. Remove all the slack in the pull rope by gently pulling the rope at the far manhole. After the slack has been removed, place a tape marker on the pull rope close to the pipe opening where the mandrell will exit to provide a means of measuring the travel distance of the mandrell so that any deflected area can be located.
- f. Pull mandrell through the sewer.
- g. This test shall be performed without any mechanical pulling device.
- h. An increasing resistance to pull is an indication of excessive deflection. If this occurs measure the distance from beginning marker on rope to manhole. Locate section and replace bedding or pipe if visual examination reveals damage. Retest as required until satisfactory results are achieved.
- i. If the mandrel can travel from one manhole to the next manhole, the sewer segment shall be considered as passing the deflection test.

4. This test shall be performed twice:

- a. once within the first 60 days of installation, but not sooner than 30 days after installation, and
- b. once during final inspection, but no sooner than 30 days after pavement backfill done, at the completion of this contract.

H. Manholes Watertightness

1. Manholes shall be tested for watertightness in accordance with ASTM C 1244 and these Specifications. Prior to testing manholes for watertightness, all liftholes 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.
2. Vacuum Tests: The manhole, after proper preparation as noted above, shall be vacuum tested prior to or after backfilling. The test head shall be placed at the inside of the top of the cone section and the compression head inflated to 40 psi to effect a seal between the vacuum base and the manhole structure. Connect the vacuum pump to the outlet port with the valve open. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9-inches. The manhole shall pass if the time is greater than that specified in the table below. If the manhole fails the initial test, necessary repairs shall be made with non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained. Vacuum testing equipment shall be equal to that as manufactured by P.A. Glazier, Inc.

Minimum Test Times (Seconds) for Various Manhole Diameters and Depths		
Depth (feet)	Diameter, feet	
	4	5
8	20	26
10	25	33
12	30	39
14	35	46
18	40	52
18	45	59

Minimum Test Times (Seconds) for Various Manhole Diameters and Depths		
Depth (feet)	Diameter, feet	
	4	5
20	50	65
22	55	72
24	59	78
26	64	85
28	69	91
30	74	98

3.09 PROTECTION AND RESTORATION OF WORK AREA

- A. General: Return all items and all areas disturbed, directly or indirectly by work under these Specifications, to their original condition or better, as quickly as possible after work is started.
1. The Contractor shall plan, coordinate, and prosecute the work such that disruption to personal property and business is held to a practical minimum.
 2. Prepare photographic documentation of sensitive areas along the project route/site to document conditions existing prior to project construction.
 3. All construction areas abutting lawns and yards of residential or commercial property shall be restored promptly. Backfilling of underground facilities, ditches, and disturbed areas shall be accomplished on a daily basis as work is completed. Finishing, dressing, and grassing shall be accomplished immediately thereafter, as a continuous operation within each area being constructed and with emphasis placed on completing each individual yard or business frontage. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.
 4. Handwork, including raking and smoothing, shall be required to ensure that the removal of roots, sticks, rocks, and other debris is removed in order to provide a neat and pleasing appearance.
 5. The Georgia Department of Transportation's engineer or the County will be authorized to stop all work by the Contractor on its right-of-way when restoration and cleanup are unsatisfactory and to require appropriate remedial measures.
- B. Man-Made Improvements: Protect, or remove and replace with the Engineer's approval, all fences, walkways, mail boxes, pipe lines, drain culverts, power and-telephone lines and cables, property pins and other improvements that may be encountered in the work.

- C. Cultivated Growth: Do not disturb cultivated trees or shrubbery unless approved by the Engineer. Any such trees or shrubbery which must be removed shall be heeled in and replanted-under the direction of an experienced nurseryman.
- D. Cutting of Trees: Do not cut trees for the performance of the work except as absolutely necessary. Protect trees that remain in the vicinity of the work from damage from equipment. Do not store spoil from excavation against the trunks. Remove excavated material stored over the root system of trees within 30 days to allow proper natural watering of the root system. Repair any damaged tree over 3-inches in diameter, not to be removed, under the direction of an experienced nurseryman. All trees and brush that require removal shall be promptly and completely removed from the work area and disposed of by the Contractor. No stumps, wood piles, or trash piles will be permitted on the work site.
- E. Disposal of Rubbish: Dispose of all materials cleared and grubbed during the construction of the project in accordance with the applicable codes and rules of the appropriate county, state and federal regulatory agencies.
- F. Swamps and Other Wetlands
 1. The Contractor shall not construct permanent roadbeds, berms, drainage structures or any other structures which alter the original topographic features within the easement.
 2. All temporary construction or alterations to the original topography will incorporate measures to prevent erosion into the surrounding swamp or wetland. All areas within the easement shall be returned to their original topographic condition as soon as possible after work is completed in the area. All materials of construction and other non-native materials shall be disposed by the Contractor.
 3. The Contractor shall provide temporary culverts or other drainage structures, as necessary, to permit the free migration of water between portions of a swamp, wetland or stream which may be temporarily divided by construction.
 4. The Contractor shall not spread, discharge or dump any fuel oil, gasoline, pesticide, or any other pollutant to adjacent swamps or wetlands.
- G. Bypassing or spilling wastewater onto the ground, into the trench, or into adjacent waters is prohibited.
- H. Dust Control: The Contractor shall use all means necessary to control dust on and near the work, and on and near all off-site borrow areas when dust is caused by the operations during performance of the work or if resulting from the condition in which the subcontractor leaves the site. The Contractor shall thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and concurrent performance of work on the site.

END OF SECTION

SECTION 9 FORCEMAIN

PART 1 GENERAL

1.01 SCOPE

- A. This Section describes products to be incorporated into force mains, pressure sewers, pressure sewer services, gravity sewer services and individual pressure systems and accessories and requirements for the installation and use of these items. Furnish all products and perform all labor necessary to fulfill the requirements of these Specifications.
- B. General: Supply all products and perform all work in accordance with applicable American Society for Testing and Material (ASTM), American Water Works Association (AWWA), American National Standards Institute (ANSI), or other recognized standards. Latest revisions of all standards are applicable.

1.02 QUALIFICATIONS

If requested by the Engineer, submit evidence that manufacturers have consistently produced products of satisfactory quality and performance for a period of at least two years

1.03 SUBMITTALS

If requested by the County or Engineer, complete shop drawings, product data and engineering data, including shop drawings, shall be submitted to the Engineer.

1.04 TRANSPORTATION AND HANDLING

- A. Unloading: Furnish equipment and facilities for unloading, handling, distributing and storing pipe, fittings, valves and accessories. Make equipment available at all times for use in unloading. Do not drop or dump materials. Any materials dropped or dumped will be subject to rejection without additional justification.
- B. Handling: Handle pipe, fittings, valves and accessories carefully to prevent shock or damage. Handle pipe by rolling on skids, forklift, or front loader. Do not use material damaged in handling.
- C. Lined pipe shall be handled and transported to prevent damage to linings.

1.05 STORAGE AND PROTECTION

- A. Store all pipe which cannot be distributed along the route. Make arrangements for the use of suitable storage areas.
- B. Stored materials shall be kept safe from damage. The interior of all pipe, fittings and other appurtenances shall be kept free from dirt or foreign matter at all times. Valves shall be drained and stored in a manner that will protect them from damage by freezing.

- C. Pipe shall not be stacked higher than the limits recommended by the manufacturer. The bottom tier shall be kept off the ground on timbers, rails or concrete. Pipe in tiers shall be alternated: bell, plain end; bell, plain end. At least two rows of timbers shall be placed between tiers and chocks, affixed to each other in order to prevent movement. The timbers shall be large enough to prevent contact between the pipe in adjacent tiers.
- D. Store joint gaskets in a cool location, out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.

1.06 QUALITY ASSURANCE

- A. Product manufacturers shall provide the Engineer with written certification that all products furnished comply with all applicable provisions of these Specifications.
- B. If ordered by the Engineer, each pipe manufacturer shall furnish the services of a competent factory representative to supervise and/or inspect the installation of pipe. This service will be furnished for a minimum of five days during initial pipe installation.

PART 2 PRODUCTS

2.01 DUCTILE IRON PIPE (DIP)

- A. Ductile Iron Pipe (DIP)
 - 1. Ductile iron pipe shall be manufactured in accordance with AWWA C 151. 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
16 - 24	250

- B. Fittings and Accessories
 - 1. Fittings shall be ductile iron and shall conform to AWWA C110/ANSI A21.10 or AWWA C153/ANSI A21.53 with a minimum rated working pressure of 250 psi.
 - 2. Thrust Collars: Thrust collars shall be welded-on ductile iron body type capable of withstanding a thrust due to 250 psi internal pressure on a dead end from either direction on that pipe size. Weld-on collars shall be continuously welded to the pipe by the pipe manufacturer. Retainer glands may be used for thrust collars where shown on the Drawings and as specified in this Section.

3. Solid Sleeves: Solid sleeves shall permit the connection of plain end ductile iron pipe and plain end PVC pipe. Solid sleeves shall meet the requirements of ANSI/AWWA C110 for long pattern and have a minimum pressure rating of 250 psi. Solid sleeves shall have a mechanical or restrained joint as specified in this Section and as shown on the Drawings. Solid sleeves shall be provided with gaskets suitable for the type of pipe to be connected. Solid sleeves shall be used only in locations shown on the Drawings or at the direction of the Engineer. Solid sleeves shall be manufactured by ACIPCO, U.S. Pipe or McWane (Clow).
- C. Joints for Ductile Iron Pipe and Fittings
1. General
 - a. Joints for ductile iron pipe and fittings shall be mechanical joint, flanged joint, restrained joint, push-on joint or as shown on the Drawings or specified herein.
 - b. Unless otherwise shown on the Drawings, specified or directed, all ductile iron pipe laid underground shall be joined using push-on type joints. All fittings shall be restrained joint.
 - c. In all cases, gaskets shall be made of material that will not be damaged by the fluid being transported nor by the environment in which the pipe is installed.
 - d. Provide the necessary bolts for connections. All bolts and nuts shall be threaded in accordance with ANSI B1.1, Coarse Thread Series, Class 2A external and 2B internal fit. All bolts and nuts shall be made in the U.S.A.
 2. Push-On Joints: Push-on joints and gaskets shall conform to AWWA Ci11/ANSI A21.11. Details of the joint design shall be in accordance with the manufacturer's standard practice such as ACIPCO "Fastite", McWane (Clow) "Bell-Tite", or U.S. Pipe "Tyton" joints.
 3. Restrained Joints
 - a. Restrained joints shall be ACIPCO "FLEX-RING" or "FAST-GRIP", U.S. "TR-FLEX" or "FIELD LOK", or mechanical joint with retainer glands.
 - b. Bolts and nuts shall be in accordance with the manufacturer's recommendations.
 - c. Gaskets shall be in accordance with the manufacturer's recommendations.
 4. Retainer Glands: Retainer glands for ductile iron pipe shall be Megalug, Series 1100, as manufactured by EBBA Iron Sales, Inc. or Uni-Flange Series 1400 as manufactured by Ford Meter Box Company, Inc.
- D. Cement Linings: Pipe and fittings shall be cement lined in accordance with AWWA C104/ANSI/AWWA C104/A21.4. Seal coat is not required.

- E. Polyethylene Encasement: Ductile iron pipe shall be encased with polyethylene film where shown on the Drawings. Polyethylene film shall meet the requirements of AWWA C105.

2.02 HIGH DENSITY POLYETHYLENE (HDPE) PIPE

- A. High density polyethylene pipe (HDPE) may be used at the discretion of the County. See Section 10 – HDPE Pipe and Fittings for specifications and requirements for using HDPE pipe.

2.03 MANHOLES AND PRECAST CONCRETE PRODUCTS

A. Precast Concrete Sections

1. Precast concrete sections shall meet the requirements of ASTM C 478. The minimum compressive strength of the concrete in precast sections shall be 4,000 psi.
2. The minimum wall thickness shall be one-twelfth of the inside diameter of the base, riser or the largest cone diameter. Additionally, the wall thickness shall be sufficient for the proper installation of the rubber boots.
3. Transition slabs which convert bases larger than four feet in diameter to four foot diameter risers shall be designed by the manhole manufacturer to carry the live and dead loads exerted on the slab.
4. Seal joints between precast sections by means of rubber O-ring gaskets or flexible butyl rubber sealant. Butyl rubber sealants shall meet the requirements of AASHTO M-198. Sealant shall be pre-formed type with a minimum nominal diameter of 1-inch. Butyl rubber sealant shall be equal to Kent Seal No. 2 or Concrete Sealants CS202.

- B. Brick and Mortar: Brick shall be whole and hardburned, conforming to ASTM C 32 Grade MS. Mortar shall be made of one part Portland cement and two parts clean sharp sand. Cement shall be Type 1 and shall conform to ASTM C 150. Sand shall meet ASTM C 144.

C. Iron Castings

1. Cast iron manhole frames and covers shall meet the requirements of ASTM A 48 for Class 30 gray iron and all applicable local standards. All castings shall be tough, close grained, smooth and free from blow holes, blisters, shrinkage, strains, cracks, cold shots and other imperfections. No casting will be accepted which weighs less than 95 percent of the design weight. Shop drawings must indicate the design weight and provide sufficient dimensions to permit checking. All castings shall be thoroughly cleaned in the shop and given two coats of approved bituminous paint before rusting begins.
2. Manhole frames and covers shall be as shown on the Standard Detail Drawings.
3. All frames and covers shall have machined horizontal bearing surfaces.
4. All manholes shall have standard frames and covers except where specifically

shown otherwise on the Drawings.

- D. Rubber Boots: Provide preformed rubber boots and fasteners equal to those manufactured by Kor-N-Seal or Press Seal Gasket Corporation.
- E. Steps: Manhole steps of polypropylene molded around a-steel rod equal to products of M.A. Industries shall be used. Manhole steps shall meet the requirements of ASTM C 478 for design, materials of construction, dimensions, and testing and acceptance.

2.04 MISCELLANEOUS ACCESSORIES

- A. Anchor Couplings: Lengths and sizes shall be as shown on the Drawings. Anchor couplings shall be equal to Tyler Pipe 5-198.
- B. Flange Adapter: The flange adapter shall permit the connection of unthreaded, ungrooved, open-ended ductile iron pipe to ANSI/ASME B16.1, Class 125 flanges. The flange adapter shall meet the test requirements of ANSI/ASME B16.1 for Class 125 flanges. The adapter shall be a ductile iron casting incorporating a flange with extended throat, set screws and gasket. The gasket shall provide a compression seal between the adapter, the pipe and the adjacent flange. Flange adapters shall be used only in locations specifically shown on the Drawings or at the direction of the Engineer, and in accordance with the manufacturer's recommendations. The flange adapter shall be manufactured by McWane, EBAA Iron Sales, Inc. or Ford Meter Box Company, Inc. Additionally, flange adapters shall be provided with 304 stainless steel harness rods of the diameter and quantity shown on the Drawings or directed by the Engineer.
- C. Pipe Supports: Pipe supported from underneath and not subject to expansion shall have adjustable pipe saddle supports on properly sized pipe stanchions and ample, properly grouted floor flanges. Saddle supports shall be equal to Grinnell, Figure 264 or Fee and Mason, Figure 291.

2.05 CONCRETE

Concrete shall have a compressive strength of not less than 3000 psi, with not less than 5.5 bags of cement per cubic yard and a slump between 3 and 5-inches. For job mixed concrete, submit the concrete mix design for approval by the Engineer. Ready-mixed concrete shall be mixed and transported in accordance with ASTM C 94. Reinforcing steel shall conform to the requirements of ASTM A 615, Grade 60.

2.06 PLUG VALVES (PV)

- A. Valves shall be 90 degree turn, non-lubricated, eccentric type with resilient faced plugs. Design of the valve shall provide that contact between the seat and the plug shall only occur in the final degrees of plug movement. Valves shall be suitable for throttling service and service where valve operation is infrequent.
- B. Valves shall provide drip-tight shut-off up to the full pressure rating with pressure in either direction. Pressure ratings shall be established by hydrostatic test conducted in accordance with ANSI B16.1. Valves shall be rated at a minimum of 150 psi.

- C. Valves shall have a port area equal to at least 80 percent of the full pipe area.
- D. Bodies shall be cast-iron, conforming to ASTM A 126, Class B (carbon steel for 2-inch valves).
- E. Valve ends shall be a mechanical joint type, except where flanged or restrained joint ends are shown on the Drawings. Mechanical joint valves shall have bell ends conforming to applicable requirements of AWWA C111/ANSI A21.11. Flanged joints shall meet the requirements of ANSI B16.1, Class 125. Flanged valves with flange-to-MJ adapters shall not be acceptable in lieu of MJ valves.
- F. Valve seats shall be a raised, welded-in overlay of not less than 90 percent pure nickel, machined to mate with the resilient faced plug. Overlay shall be minimum of 1/8-inch thick.
- G. The plug shall be of semi-steel, conforming to ASTM A 126, Class B. The plug facing shall be a synthetic rubber compound of approximately 70 durometer hardness bonded to the plug. Facing material shall be abrasion resistant and suitable for service in sewage and sludge applications.
- H. Valves shall be furnished with replaceable, sleeve-type bearings in the upper and lower journals. Bearings shall comply with applicable requirements of AWWA C507. Bearing materials shall have a proven record of service of not less than five years.
- I. The valve body shall be fitted with a bolted bonnet incorporating a stuffing box and pull-down packing gland. Packing shall be the split chevron type. Design of exposed valves shall allow visible inspection of the shaft seal, adjustment of the packing, and replacement of the packing, all without disturbing the bonnet or valve operator. The shaft seal shall comply with the requirements of AWWA C504.
- J. Actuators
 1. Valves for exposed service, 3 through 8-inches in diameter, shall be lever operated. Hand levers shall be steel with a non-metallic grip.
 2. Actuators for buried service and valves 10-inches and larger, shall be equipped with manual operated geared actuators. Geared actuators shall be totally enclosed, oil lubricated, worm and gear type. Shaft seals shall be provided to prevent entry of dirt and water into the actuator. All shaft bearings shall be permanently lubricated bronze bushings. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque. Construction of actuator housing shall be semi-steel. Gear actuators shall comply with requirements of AWWA C504.
 3. Gear actuators for buried valves 10-inches and larger in diameter shall be mounted above ground on an extended bonnet.
 4. Motorized actuators shall be provided where shown on the Drawings and as specified in this Section.
 5. Valves and operators for submerged or buried service shall have seals on all

shafts and gaskets on valve operator covers to prevent the entry of water. Operator mounting brackets for submerged service shall be totally enclosed and shall have gasket seals.

- K. Operators
 - 1. Valves for non-buried service, six feet or more above the operating floor shall be furnished with a chainwheel operator and chain for operation from floor level. All other valves shall be equipped with a handwheel operator.
 - 2. Valves, 3 through 8-inches, for buried service shall have a nut type operator and shall be equipped with a valve box and stem extension required to bring the operation nut within 6-inches of finished grade. Valve boxes and extension stems shall be as specified in this Section.
- L. All exposed bolts, nuts, and washers for buried or submerged valves shall be stainless steel. All exposed nuts, bolts, springs, washers, and miscellaneous hardware shall be zinc coated in accordance with ASTM A 153 unless specified otherwise.
- M. Acceptable Manufacturers: All plug valves shall be products of a single manufacturer who must submit evidence of five years satisfactory service in sewage applications of the same design and of the sizes required. Valves shall be manufactured by DeZurik or Keystone.

2.07 AIR VALVES FOR SEWERAGE SERVICE

- A. General: Unless specifically approved by the County, combination air valves shall be installed in accordance with these Specifications.
- B. Air Release Valves: Valves shall be automatic air release valves designed to allow escape of air under pressure and close water-tight when liquid enters the valve. Valve shall have a 1-inch NPT inlet and a maximum orifice diameter of 3/32-inch. The valve body shall be cast iron, designed to facilitate disassembly for cleaning and maintenance. The float shall be stainless steel; the valve seat and all working parts shall be of corrosion-resistant materials. Valves shall be equipped with the necessary attachments, including valves, quick disconnect couplings and hose, to permit back flushing after installation without dismantling the valve.
- C. Air/Vacuum Valves: Valves shall be automatic air and vacuum valves designed to allow escape of air, close water-tight when liquid enters the valve, and allow air to enter in the event of a vacuum. The valve body shall be cast iron, designed to facilitate disassembly for cleaning and maintenance. The float shall be stainless steel; the valve seat and all working parts shall be of corrosion-resistant materials. Valves shall be equipped with the necessary attachments, including valves, quick disconnect couplings and hose, to permit back flushing after installation without dismantling the valve. The valves shall have an orifice diameter of 2-inches and NPT inlet and outlet diameters of 2 x 2-inches.
- D. Combination air valve shall consist of an air release valve tapped into the body of an air and vacuum valve.

- E. Single Body Valve: In lieu of D. above, a single body, double orifice, sewage combination valve may be used. Materials of construction, orifice size, venting capacity and accessories shall meet the requirements of B. and C. above.
- F. Valves shall be recommended by the manufacturer for wastewater service with normal operating pressures to approximately 60 psig, and frequent surge pressures of approximately 175 psig and shall be equal to APCO Valve Corporation or Val-Matic.

2.08 VALVE BOXES (VB) AND EXTENSION STEMS

A. Valve Boxes

1. Unless shown otherwise on the Drawings, all valves shall be equipped with valve boxes. The valve boxes shall be cast iron two-piece screw type with drop covers. Valve boxes shall have a 5.25-inch inside diameter. Valve box covers shall weigh a minimum of 13 pounds. The valve boxes shall be adjustable to 6-inches up or down from the nominal required cover over the pipe. Valve boxes shall be of sufficient length that bottom flange of the lower belled portion of the box is below the valve operating nut. Ductile or cast iron extensions shall be provided as necessary. Covers shall have "SEWER" cast into them. Valve boxes shall be manufactured in the United States.
2. Valve boxes shall be manufactured by Tyler or Opelika.

- B. Extension Stems: Extension stems shall be provided if depth of bury places the operating nut in excess of 60-inches beneath finished grade, so as to set the top of the operating nut 30-inches below finished grade. Connection to the valve shall be with a wrench nut coupling and a set screw to secure the coupling to the valve's operating nut. The coupling and square wrench nut shall be welded to the extension stem. Extension stems shall be equal to Mueller 26441 or M & H Valve, Style 3 8 0 1 ;

PART 3 EXECUTION

3.01 EXISTING UTILITIES AND OBSTRUCTIONS

- A. The Drawings indicate utilities or obstructions that are known to exist according to the best information available to the Owner. The Contractor shall call the Utilities Protection Center (UPC) (325-5000 or 1-800-282-7411) as required by Georgia law (O.C.G.A. §§ 25-9-1 through 25-9-13) and all utilities, agencies or departments that own and/or operate utilities in the vicinity of the construction work site, at least 72 hours (three business days) prior to construction, to verify the location of the existing utilities.
- B. Existing Utility Location: The following steps shall be exercised to avoid interruption of existing utility service.
 1. Provide the required notice to the utility owners and allow them to locate their facilities according to Georgia law. Field utility locations are valid for only ten days after original notice. The Contractor shall ensure, at the time of any excavation, that a valid utility location exists at the point of excavation.

2. Expose the facility to verify its true location and grade for a distance of at least 200 feet in advance of pipeline construction to verify its true location and grade. Repair, or have repaired, any damage to utilities resulting from locating or exposing their true location.
 3. Avoid utility damage and interruption by protecting it with means or methods recommended by the utility owner.
 4. Maintain a log identifying when phone calls were made, who was called, area for which utility relocation was requested and work order number issued, if any.
- C. Conflict with Existing Utilities
1. Horizontal Conflict: Horizontal conflict shall be defined as when the actual horizontal separation between a utility, main, or service and the proposed pressure main does not permit safe installation of the pressure main by the use of sheeting, shoring, tying-back, supporting, or temporarily suspending service of the parallel or crossing facility. The Contractor may change the proposed alignment of the pressure main to avoid horizontal conflicts if the new alignment remains within the available right-of-way or easement and complies with regulatory agency requirements after a written request to and subsequent approval by the Engineer. If, in the opinion of the Engineer, the pressure main's proposed location cannot be adjusted, thus requiring the relocation of an existing utility, the Owner will direct the Contractor to have the utility relocated.
 2. Vertical Conflict: Vertical conflict shall be defined as when the actual vertical separation between a utility, main, or service and the proposed pressure main does not permit the crossing without immediate or potential future damage to the utility, main, service, or the pressure main. The Contractor may change the proposed grade of the pressure main to avoid vertical conflicts if the changed grade provides minimum required capacity, maintains adequate cover and complies with regulatory agencies requirements, after written request to and subsequent approval by the Engineer. If, in the opinion of the Engineer, the pressure main's proposed location cannot be adjusted, thus requiring the relocation of an existing utility, the Owner will direct the Contractor to have the utility relocated.
- D. Water and Force Main Separation
1. Force mains should maintain a minimum 10 foot edge-to-edge separation from water mains. Where the sewer crosses a water main, an 18-inch vertical separation shall be maintained where possible. Where possible, a full length of force main pipe shall be centered on the water main. Any deviation shall be requested in writing to the Engineer.
 2. Where the force main crosses over a water main, the water main shall be encased in concrete to the first joint in each direction.

3. No water main shall be permitted to pass through or come in contact with any part of a manhole.
- E. Miscellaneous Obstructions: The Contractor shall coordinate its work with the individual property owners during the installation of the Individual Pumping Systems. Property owners may have invisible fences, underground sprinkler systems, storm drainage, and other miscellaneous obstructions which must be worked around. The Contractor shall take all necessary measures to minimize disruption or damage to such systems. The Contractor shall restore any damage to personal property as soon as possible.

3.02 CONSTRUCTION ALONG HIGHWAYS, STREETS AND ROADWAYS

- A. Install pipe lines and appurtenances along highways, streets and roadways in accordance with the applicable regulations of, and permits issued by applicable regulatory agencies with reference to construction operations, safety, traffic control, road maintenance and repair.
- B. Traffic Control
 1. The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient lights and other traffic control devices; provide qualified flagmen where necessary to direct traffic; take all necessary precautions for the protection of the work and the safety of the public.
 2. Construction traffic control devices and their installation shall be in accordance with the current U.S. DOT Manual On Uniform Traffic Control Devices for Streets and Highways Section 104.05 and 107.07 and the Georgia Department of Transportation Standard Specification Section 107.09.
 3. Placement and removal of construction traffic control devices shall be coordinated with the Georgia Department of Transportation and Barrow County a minimum of 48 hours in advance of the activity.
 4. Placement of construction traffic control devices shall be scheduled ahead of associated construction activities. Construction time in street right-of-way shall be conducted to minimize the length of time traffic is disrupted. Construction traffic control devices shall be removed immediately following their useful purpose. Traffic control devices used intermittently, such as "Flagmen Ahead", shall be removed and replaced when needed.
 5. Existing traffic control devices within the construction work zone shall be protected from damage. Traffic control devices requiring temporary relocation shall be located as near as possible to their original vertical and horizontal locations. Original locations shall be measured from reference points and recorded in a log prior to relocation. Temporary locations shall provide the same visibility to affected traffic as the original location. Relocated traffic control devices shall be reinstalled in their original locations as soon as practical following construction.

6. Construction traffic control devices shall be maintained in good repair, and shall be clean and visible to affected traffic for daytime and nighttime operation. Traffic control devices affected by the construction work zone shall be inspected daily.
 7. Construction warning signs shall be black legend on an orange background. Regulatory signs shall be black legend on a white background. Construction sign panels shall meet the minimum reflective requirements of the Georgia Department of Transportation and Barrow County. Sign panels shall be of durable materials capable of maintaining their color, reflective character and legibility during the period of construction.
 8. Channelization devices shall be positioned preceding an obstruction at a taper length as required by the current Manual On Uniform Traffic Control Devices for Streets and Highways, as appropriate for the speed limit at that location. Channelization devices shall be patrolled to insure that they are maintained in the proper position throughout their period of use.
- C. Construction Operations
1. Perform all work along highways, streets and roadways to minimize interference with traffic.
 2. Stripping: Where the pipe line is laid along road right-of-way, strip and stockpile all sod, topsoil and other material suitable for right-of-way restoration.
 3. Trenching, Laying and Backfilling: Do not open the trench any further ahead of pipe laying operations than is necessary. Backfill and remove excess material immediately behind laying operations. Complete excavation and backfill for any portion of the trench in the same day.
 4. Shaping: Reshape damaged slopes, side ditches, and ditch lines immediately after completing backfilling operations. Replace topsoil, sod and any other materials removed from shoulders.
 5. Construction operations shall be limited to 400 feet along areas, including clean-up and utility exploration unless otherwise approved by the Engineer.
- D. Excavated Materials: Do not place excavated material along highways, streets and roadways in a manner which obstructs traffic. Sweep all scattered excavated material off the pavement in a timely manner.
- E. Drainage Structures: Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.
- F. Landscaping Features: Landscaping features shall include, but are not necessarily limited to: fences; property corners; cultivated trees and shrubbery; manmade improvements; subdivision and other signs within the right-of-way and easement. The Contractor shall take extreme care in moving landscape features and promptly re-establishing these features:

G. Maintaining Highways, Streets, Roadways and Driveways

1. The pressure sewer mains shall be punched under all paved surfaces. After several unsuccessful attempts to punch the pipe, the Engineer may direct the Contractor to trench across the pavement.
2. Maintain streets, highways, roadways and driveways in suitable condition for movement of traffic until completion and final acceptance of the work.
3. During the time period between pavement removal and completing permanent pavement replacement, maintain highways, streets and roadways by the use of steel running plates. The edges of running plates shall have asphalt placed around their periphery to minimize vehicular impact. The backfill above the pipe shall be compacted, as specified elsewhere up to the existing pavement surface to provide support for the steel running plates.
4. Furnish a road grader or front-end loader for maintaining highways, streets, and roadways. Make the grader or front-end loader available at all times.
5. Immediately repair all driveways that are cut or damaged. Maintain them in a suitable condition for use until completion and final acceptance of the work.

3.03 PIPE DISTRIBUTION

- A. Pipe shall be distributed and placed in such a manner that will not interfere with traffic.
- B. No pipe shall be strung further along the route than 1,000 feet beyond the area in which the Contractor is actually working without written permission from the Owner. The Owner reserves the right to reduce this distance to a maximum distance of 200 feet in residential and commercial areas based on the effects of the distribution to the adjacent property owners.
- C. No street or roadway may be closed for unloading of pipe without first obtaining permission from the proper authorities. The Contractor shall furnish and maintain proper warning signs and obstruction lights for the protection of traffic along highways, streets and roadways upon which pipe is distributed.
- D. No distributed pipe shall be placed inside drainage ditches.
- E. Distributed pipe shall be placed as far as possible from the roadway pavement, but no closer than five feet from the roadway pavement, as measured edge-to-edge,

3.04 LAYING AND JOINTING PIPE AND ACCESSORIES

- A. Lay all pipe and fittings to accurately conform to the lines and grades established by the Engineer.
- B. Pipe Installation
 1. Proper implements, tools and facilities shall - be provided for the safe performance of the Work. All pipe, fittings and valves shall be lowered carefully into the trench by means of slings, ropes or other suitable tools or equipment in

such a manner as to prevent damage to sewer materials and protective coatings and linings. Under no circumstances shall sewer materials be dropped or dumped into the trench.

2. All pipe, fittings, valves and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the Engineer, who may prescribe corrective repairs or reject the materials.
3. All lumps, blisters and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and free from dirt, sand, grit or any foreign materials before the pipe is laid. No pipe which contains dirt shall be laid.
4. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing or other materials shall be placed in the pipe at any time.
5. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.
6. It is common practice to lay pipe with the bells facing the direction in which work is progressing; however, it is not mandatory.
7. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade shall not be permitted.
8. Polyethylene Encasement: Installation shall be in accordance with AWWA C105 and the manufacturer's instructions. All ends shall be securely closed with tape and all damaged areas shall be completely repaired to the satisfaction of the Engineer.

C. Alignment and Gradient

1. Lay pipe straight in alignment and gradient or follow true curves, where shown on the Drawings, as nearly as practicable. Do not deflect any joint more than the maximum deflection recommended by the manufacturer.
2. Maintain a transit, level and accessories on the job to lay out angles and ensure that deflection allowances are not exceeded.
3. Do not install force main such as to generate a high point except where shown on the Drawings. Prior to backfilling trench, the Contractor shall survey elevation of force main top of pipe barrel at minimum 100-foot intervals, at all bends, at all air valves, and where elevations are shown on the Drawings. The location description and elevation of each benchmark used for this survey shall be recorded. Vertical deflections required to avoid existing underground obstructions shall not result in a high point in the force main unless approved by the Engineer.

4. Any section of force main which is determined to have been installed such that a high point is generated at a location other than that shown on the Drawings shall be removed and reinstalled to the correct elevation, unless the variation in elevation was approved in writing by the Engineer.
 5. Any pipe which has had its alignment, grade or joints disturbed after installation shall be removed and reinstalled to the correct vertical and horizontal alignment.
- D. Expediting of Work: Excavate, lay the pipe, and backfill as closely together as possible. Do not leave unjointed pipe in the trench overnight. Backfill and compact the trench as soon as possible after laying and jointing is completed. Cover the exposed end of the installed pipe each day at the close of work and at all other times when work is not in progress. If necessary to backfill over the end of an uncompleted pipe or accessory, close the end with a suitable plug, either push-on, mechanical joint, restrained joint or as approved by the Engineer.
- E. Joint Assembly
1. Push-on, mechanical, flange, restrained type joints and HDPE fused joints, shall be assembled in accordance with the manufacturer's recommendations.
 2. Each restrained joint shall be inspected by the Contractor to ensure that it has been "homed 100 percent.
- F. Cutting Pipe
1. Cut ductile iron pipe using an abrasive wheel saw.
 2. Remove all burrs and smooth the end before jointing.
 3. The Contractor shall cut the pipe and bevel the end, as necessary, to provide the correct length of pipe necessary for installing the fittings, valves, accessories and closure pieces in the correct location. Only push-on or mechanical joint pipe shall be cut.
- G. Valve and Fitting Installation
1. Prior to installation, valves shall be inspected for direction of opening, number of turns to open, freedom of operation, tightness of pressure-containing bolting and test plugs, cleanliness of valve ports and especially seating surfaces, handling damage and cracks. Defective valves shall be corrected or held for inspection by the Engineer. Valves shall be closed before being installed.
 2. Valves, fittings, plugs and caps shall be set and joined to the pipe in the manner specified in this Section for cleaning, laying and joining pipe, except that 12-inch and larger valves shall be provided with special support, such as treated timbers, crushed stone, concrete pads or a sufficiently tamped trench bottom so that the pipe will not be required to support the weight of the valve.
 3. A valve box shall be provided on each underground valve. They shall be carefully set, centered exactly over the operating nut and truly plumbed. The valve box shall not transmit shock or stress to the valve. The bottom flange of the lower

belled portion of the box shall be placed below the valve operating nut. This flange shall be set on brick, so arranged that the weight of the valve box and superimposed loads will bear, on the base and not on the valve or pipe. Extension stems shall be installed where depth of bury places the operating nut in excess of 30-inches beneath finished grade so as to set the top of the operating nut 30-inches below finished grade. The valve box cover shall be flush with the surface of the finished area or such other level as directed by the Engineer.

4. In no case shall valves be used to bring misaligned pipe into alignment during installation. Pipe shall be supported in such a manner as to prevent stress on the valve.

H. Air Valve Manholes

1. Construct the vault or manhole as detailed on the Drawings.
2. The frame and cover shall be cast into the top slab or cone.
3. Where vent pipe are shown on the Drawings, vents shall be of one-piece, welded steel construction. Vent pipes shall equal air valve size, but no less than 4-inches. The vent pipe shall be grouted into a precast hole in the vault. The discharge of the vent pipe shall be provided with a 3/16-inch PVC coated mesh screen.

3.05 MANHOLE AND PRECAST CONCRETE PRODUCT CONSTRUCTION

- A. Construct manholes as shown on the Drawings.
- B. Precast Concrete: Handle sections carefully to prevent cracking or chipping. Provide uniform bedding of the bottom section to prevent uneven loading. Install gaskets and joint sealants in accordance with manufacturer's recommendations to produce a watertight structure.
- C. Brick: Bed the bottom and sides of every brick in mortar. Apply a smooth coat of mortar, 3/4-inch thick, on the inside and outside.
- D. Top Elevations: Build manholes outside of paved areas to 18-inches above finished grade unless otherwise shown on the Drawings or directed by the Engineer. Build manholes in paved areas to existing grades.
- E. Frames and Covers: Unless frame and cover is at grade, the frame shall be cast into the cone section.
- F. Manholes shall be constructed such that their walls are plumb.

3.06 THRUST RESTRAINT

- A. Provide restraint at all points where hydraulic thrust may develop.
- B. Retainer Glands: Provide retainer glands where shown on the Drawings and all associated fittings, valves and related piping. Retainer glands shall be installed in accordance with the manufacturer's recommendations, particularly, the required torque of the set screws. The Contractor shall furnish a torque wrench to verify the

torque on all set screws which do not have inherent torque indicators.

- C. Harnessing: Provide harness rods' only where specifically shown on the Drawings or directed by the Engineer. Harness rods shall be manufactured in accordance with ASTM A 36 and shall have an allowable tensile stress of no less than 22,000 psi. Harness rods shall be hot dip galvanized or field coated with bitumastic before backfilling. Where possible, harness rods shall be installed through the mechanical joint bolt holes. Where it is not possible, provide 90 degree bend eye bolts. Eye bolts shall be of the same diameter as specified in AWWA C111 for that pipe size. The eye shall be welded closed. Where eye bolts are used in conjunction with harness rods, an appropriate size washer shall be utilized with a nut on each end of the harness rod. Eye bolts shall be of the same material and coating as the harness rods.
- D. Concrete Blocking
 - 1. Provide concrete blocking for all other bends, tees, valves, and other points where thrust may develop, except where other means of thrust restraint are specifically shown on the Drawings.
 - 2. Form and pour concrete blocking at fittings as shown on the Drawings and as directed by the Engineer. Pour blocking against undisturbed earth. Increase dimensions when required by over excavation.
- E. Thrust Collars: Collars shall be constructed as shown on the Drawings. Concrete and reinforcing steel shall meet the requirements specified in Article 2.03 of this Section. The welded-on collar shall be attached to the pipe by the pipe manufacturer.

3.07 CONCRETE COLLARS

Construct collars as shown on the Drawings

3.08 INSPECTION AND TESTING

A. Pressure and Leakage Test

- 1. All sections of pipeline subject to internal pressure shall be pressure tested in accordance with AWWA C600. A section of line will be considered ready for testing after completion of all thrust restraint and backfilling. Each segment of pipeline between line valves shall be tested individually.
- 2. Test Preparation
 - a. Flush pipeline section thoroughly at flow velocities adequate to remove debris from pipe and valve seats. Partially operate valves and hydrants to clean out seats. Provide correctly sized temporary outlets in number adequate to achieve flushing velocities.
 - b. Provide temporary blocking, bulkheads, flanges and plugs as necessary, to assure all new pipe, valves and appurtenances will be pressure tested.
 - c. Before applying test pressure, air shall be completely expelled from the pipeline and all appurtenances. Unless permanent air vents are in place,

insert temporary corporation stops at highpoints to expel air as line is filled with water.

- d. Fill pipeline slowly with water. Provide a suitable pump with an accurate water meter to pump the line to the specified pressure. Differential pressure at valves and hydrants shall equal the maximum possible, but shall not exceed manufacturer's pressure rating.
3. Test Pressure: Test the pipeline such that no point has a pressure less than the pump discharge pressure plus 75 psi, and not less than 100 psi, for at least two hours. The test pressure shall not vary by more than 5 psi for the test duration. Should the pressure drop more than 5 psi at any time during the test period, the pressure shall be restored to the specified test pressure. Provide an accurate pressure gage with graduation not less than 5 psi.
4. Leakage: Leakage shall be defined as the quantity of water that must be pumped into the test section equal to the sum of the water, to maintain pressure within 5 psi of the specified test pressure for the test duration. Leakage shall be the total cumulative amount measured on a water meter.' The Owner assumes no responsibility for leakage occurring through existing valves.
5. Test Results: No test section shall be accepted if the leakage exceeds the limits determined under Section 4 of AWWA C600. The leakage test shall be repeated until the test section is accepted. All visible leaks shall be repaired regardless of leakage test results.
6. Completion: After a pipeline section has been accepted, relieve test pressure. Record type, size and location of all outlets on record drawings.

3.09 PROTECTION AND RESTORATION OF WORK AREA

- A. General: Return all items and all areas disturbed, directly or indirectly by work under these Specifications, to their original condition or better, as quickly as possible after work is started.
 1. The Contractor shall plan, coordinate, and prosecute the work such that disruption to personal property and business is held to a practical minimum.
 2. Prepare photographic documentation of sensitive areas along the project route/site to document conditions existing prior to project construction.
 3. All construction areas abutting lawns and yards of residential or commercial property shall be restored promptly. Backfilling of underground facilities, ditches, and disturbed areas shall be accomplished on a daily basis as work is completed. Finishing, dressing, and grassing shall be accomplished immediately thereafter, as a continuous operation within each area being constructed and with emphasis placed on completing each individual yard or business frontage. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.
 4. Handwork, including raking and smoothing, shall be required to ensure that the

removal of roots, sticks, rocks, and other debris is removed in order to provide a neat and pleasing appearance.

5. The Georgia Department of Transportation's engineer or the County will be authorized to stop all work by the Contractor on its right-of-way when restoration and cleanup are unsatisfactory and to require appropriate remedial measures.
- B. Man-Made Improvements: Protect, or remove and replace with the Engineer's approval, all fences, walkways, mail boxes, pipe lines, drain culverts, power and telephone lines and cables, property pins and other improvements that may be encountered in the work.
 - C. Cultivated Growth: Do not disturb cultivated trees or shrubbery unless approved by the Engineer. Any such trees or shrubbery which must be removed shall be heeled in and replanted under the direction of an experienced nurseryman.
 - D. Cutting of Trees: Do not cut trees for the performance of the work except as absolutely necessary. Protect trees that remain in the vicinity of the work from damage from equipment. Do not store spoil from excavation against the trunks. Remove excavated material stored over the root system of trees within 30 days to allow proper natural watering of the root system. Repair any damaged tree over 3-inches in diameter, not to be removed, under the direction of an experienced nurseryman. All trees and brush that require removal shall be promptly and completely removed from the work area and disposed of by the Contractor. No stumps, wood piles, or trash piles will be permitted on the work site.
 - E. Swamps and Other Wetlands
 1. The Contractor shall not construct permanent roadbeds, berms, drainage structures or any other structures which alter the original topographic features within the easement.
 2. All temporary construction or alterations to the original topography will incorporate measures to prevent erosion into the surrounding swamp or wetland. All areas within the easement shall be returned to their original topographic condition as soon as possible after work is completed in the area. All materials of construction and other non-native materials shall be disposed, by the Contractor.
 3. The Contractor shall provide temporary culverts or other drainage structures, as necessary, to permit the free migration of water between portions of a swamp, wetland or stream which may be temporarily divided by construction.
 4. The Contractor shall not spread, discharge or dump any fuel oil, gasoline, pesticide, or any other pollutant to adjacent swamps or wetlands.
 - F. Bypassing or spilling wastewater onto the ground, into the trench, or into adjacent waters is prohibited.
 - G. Dust Control: The Contractor shall use all means necessary to control dust on and near the work, and on and near all off-site borrow areas when dust is caused by the

operations during performance of the work or if resulting from the condition in which the subcontractor leaves the site. The Contractor shall thoroughly moisten all surfaces as required to prevent dust being a nuisance to the public, neighbors, and concurrent performance of work on the site.

END OF SECTION

SECTION 10 HDPE PIPE AND FITTINGS

PART 1 GENERAL

1.01 DESCRIPTION

This specification includes but is not limited to high-density polyethylene (PE 3408) (ductile iron pipe size O.D) pressure pipe primarily intended for the transportation of water and sewage either buried or above grade.

1.02 REFERENCES

Reference: Title:

AWWA C901 Polyethylene (PE) pressure Pipe & Tubing, ½ inch through 3 inch for water

AWWA C906 Polyethylene (PE) pressure Pipe & Fittings, 4 inch through 63 inch for water

ASTM D3035 Standard Spec for PE Pipe (DR-PR) Based on Controlled Outside Diameter

ASTM D3261 Butt Heat Fusion PE Fittings for PE Pipe & Tubing

ASTM D3350 Standard Specification for PE Pipe & Fittings Materials

ASTM D1238 Melt Flow Index

ASTM D1505 Density of Plastics

ASTM D2837 Hydrostatic Design Basis

NSF Std.#14

TR-33/2005

Plastic Piping Components & Related Materials

Generic Butt Fusion Joining Procedure for Field Joining of PE Pipe

1.03 GENERAL

A. USE

High Density Polyethylene (HDPE) pipes/fittings shall be allowed for use as wastewater and reclaimed water pressure pipe where compatible with the specific conditions of the project. The use of material other than HDPE pipe may be required by the Engineer if it is determined that HDPE pipe is unsuitable for the particular application. All material used in the production of water main piping shall be approved by the National Sanitation Foundation (NSF).

B. DOCUMENTATION

1. Documentation from the resin's manufacturer showing results of the following tests for resin identification:
 - a. Melt Flow Index ASTM D1238
2. Density ASTM D1505

C. MANUFACTURER

All HDPE pipe and fittings shall be from a single manufacturer, who is fully experienced, reputable and qualified in the manufacture of the HDPE pipe to be furnished. The pipe shall be designed, constructed and installed in accordance with

the best practices and methods and shall comply with these Specifications. Qualified manufacturers shall be: PLEXCO Division of Chevron Chemical Company, DRISCOPIPE as manufactured by Phillips Products Co., Inc., SCLAIRPIPE as manufactured by Dupont of Canada or equal as approved by the Utilities Engineer.

D. FINISHED PRODUCT EVALUATION

1. Production staff shall check each length of pipe produced for the items listed below. The results of all measurements shall be recorded on production sheets, which become part of the manufacturer's permanent records.
 - a. Pipe in process shall be checked visually, inside and out for cosmetic defects (grooves, pits, hollows, etc.)
 - b. Pipe outside diameter shall be measured using a suitable periphery tape to ensure conformance with ASTM F714 or ASTM D3035, whichever is applicable.
 - c. Pipe wall thickness shall be measured at 12 equally spaced locations around the circumference at both ends of the pipe to ensure conformance with ASTM F714 or ASTM D3035, whichever is applicable.
 - d. Pipe length shall be measured.
 - e. Pipe marking shall be examined and checked for accuracy.
 - f. Pipe ends shall be checked to ensure they are cut square and clean.
 - g. Subject inside surface to a "reverse bend test" to ensure the pipe is free of oxidation (brittleness).

E. STRESS REGRESSION TESTING

The polyethylene pipe manufacturer shall provide certification that stress regression testing has been performed on the specific polyethylene resin being utilized in the manufacture of this product. This stress regression testing shall have been done in accordance with ASTM D2837 and the manufacturer shall provide a product supplying a minimum Hydrostatic Design Basis (HDB) of 1,600 psi as determined in accordance with ASTM D2837.

F. COMPATIBILITY

Contractor is responsible for compatibility between pipe materials, fittings and appurtenances.

G. WARRANTY

The pipe MANUFACTURER shall provide a warranty against manufacturing defects of material and workmanship for a period of ten years after the final acceptance of the project by the OWNER. The MANUFACTURER shall replace at no expense to the OWNER any defective pipe/fitting material including labor within the warranty period.

PART 2 PRODUCTS

2.01 MATERIALS FOR PIPE SIZES 4-INCH DIAMETER AND LARGER

- A. Materials used for the manufacture of polyethylene pipe and fittings shall be made from a PE 3408 high density polyethylene resin compound meeting cell classification 345434C per ASTM D3350; and meeting Type III, Class C, Category 5, Grade P34 per ASTM D1238.
- B. High Density Polyethylene (HDPE) pipe shall comply with AWWA Specifications C906.
- C. If rework compounds are required, only those generated in the Manufacturer's own plant from resin compounds of the same class and type from the same raw material supplier shall be used.
- D. Dimensions and workmanship shall be as specified by ASTM F714. HDPE fittings and transitions shall meet ASTM D3261. HDPE pipe shall have a minimum density of 0.955 grams per cubic centimeter. All HDPE pipe and fittings shall have a Hydrostatic Design Basis (HDB) of 1,600 psi.
- E. HDPE pipe and accessories 4-inch diameter and larger, shall be 160 psi at 73.4°F meeting the requirements of Standard Dimension Ratio (SDR) 17 as MINIMUM STRENGTH.
- F. The pipe Manufacturer must certify compliance with the above requirements.

2.02 MATERIALS FOR PIPE SIZES LESS THAN 4-INCH DIAMETER

- A. Materials used for the manufacture of polyethylene pipe and fittings shall be made from a PE 3408 high density polyethylene resin compound meeting cell classification 345434C per ASTM D3350; and meeting Type III, Class C, Category 5, Grade P34 per ASTM D1238.
- B. High Density Polyethylene (HDPE) pipes shall comply with AWWA Specifications C901.
- C. If rework compounds are required, only those generated in the Manufacturer's own plant from resin compounds of the same class and type from the same raw material supplier shall be used.
- D. Dimensions and workmanship shall be as specified by ASTM D3035. HDPE fittings and transitions shall meet ASTM D3261. HDPE pipe shall have a minimum density of 0.955 grams per cubic centimeter. All HDPE pipe and fittings shall have a Hydrostatic Design Basis (HDB) of 1,600 psi.
- E. HDPE pipe and accessories less than 4-inch in diameter, shall be 160 psi at 73.4°F meeting the requirements of Standard Dimension Ratio (SDR) 17 as MINIMUM STRENGTH.
- F. The pipe Manufacturer must certify compliance with the above requirements.

2.03 FITTINGS

- A. All molded fittings and fabricated fittings shall be fully pressure rated to match the pipe SDR pressure rating to which they are made. All fittings shall be molded or fabricated by the manufacturer. No Contractor fabricated fittings shall be used unless approved by the Engineer.
- B. The manufacturer of the HDPE pipe shall supply all HDPE fittings and accessories as well as any adapters and/or specials required to perform the work as shown on the Drawings and specified herein.
- C. All fittings shall be installed using butt-fused fittings, thermo-fused fittings/couplings, or flanged adapters and must be approved by the Engineer. **NO** size on size wet taps shall be permitted.
- D. All transition from HDPE pipe to ductile iron or PVC shall be made per the approval of the Engineer and per the HDPE pipe manufacturer's recommendations and specifications. A molded flange connector adapter within a carbon steel back-up ring assembly shall be used for pipe type transitions. Ductile iron back-up rings shall mate with cast iron flanges per ANSI B16.1. A 316 stainless steel back-up ring shall mate with a 316 stainless steel flange per ANSI B16.1.
 1. Transition from HDPE to ductile iron fittings and valves shall be approved by the Engineer before installation.
 2. No solid sleeves shall be allowed between such material transitions.
 3. Fittings and transitions shall be as manufactured by Phillips Driscopipe, Inc., 1000 Series Pressure Pipe, Chevron Chemical Company Plexco/Spiralite pipe, or equal.
 4. The pipe supplier must certify compliance with the above requirements.

2.04 PIPE IDENTIFICATION

- A. The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding 5-feet:
 1. Name and/or trademark of the pipe manufacturer.
 2. Nominal pipe size.
 3. Dimension ratio.
 4. The letters PE followed by the polyethylene grade in accordance with ASTM D1248 followed by the hydrostatic design basis in 160's of psi, e.g., PE 3408.
 5. A production code from which the date and place of manufacture can be determined.
 6. Color Identification, either stripped by co-extruding longitudinal identifiable color markings or shall be solid in color and as follows:
 - a. GREEN – Sanitary Sewer

- b. Purple – Reclaimed Water
- B. Tracing Wire: Tracing Wire shall be installed in the same ditch as the force main or reuse pipe and shall be marked by the use of a continuous multi-strand wire, 10 gauge THHN, green in color for force mains, and purple in color for reuse mains, for the entire length of the pipe. The wire shall be affixed to the top of the pipe by identification tape. In situations where identification tape will not adhere to the pipe, the marking wire shall be wrapped around the pipe. Where splices are required, they shall be in accordance with County Standards. All mains shall have locator boxes installed a minimum of every 1,000 feet.

PART 3 EXECUTION

3.01 JOINTING METHOD

- A. The pipe shall be joined with butt, heat fusion joints as outlined in ASTM D2657 and conform to the Generic Butt Fusion Joining Procedure for Field Joining of Polyethylene Pipe, Technical Report TR-33/2005, published by the Plastic Pipe Institute (PPI). All joints shall be made in strict compliance with the manufacturer's recommendations. If requested by the County, a factory qualified joining technician as designated by pipe manufacturer or experienced, trained technician shall perform heat fusion joints in the presence of the County inspector for quality inspection.
- B. Lengths of pipe shall be assembled into suitable installation lengths by the buttfusion process. All pipe so joined shall be made from the same class and type of raw material made by the same raw material supplier. Pipe shall be furnished in standard laying lengths not to exceed 50 feet and no shorter than 20 feet.
- C. On days butt fusions are to be made, the first fusion shall be a trial fusion in the presence of a County inspector. The following shall apply:
 - 1. Heating plates shall be inspected for cuts and scrapes. The plate temperature shall be measured at various locations to ensure proper heating/melting per manufacturer's recommendations and approval by the inspector.
 - 2. The fusion or test section shall be cut out after cooling completely for inspection.
 - 3. The test section shall be 12" or 30 times (minimum) the wall thickness in length and 1" or 1.5 times the wall thickness in width (minimum).
 - 4. The joint shall be visually inspected as to continuity of "beads" from the melted material, and for assurance of "cold joint" prevention (i.e. – joint shall have visible molded material between walls of pipe). Joint spacing between the walls of the two ends shall be a minimum of 1/16" to a maximum 3/16".
- D. The polyethylene flange adapters at pipe material transitions shall be backed up by stainless steel flanges conforming to ANSI B16.1 and shaped as necessary to suit the outside dimensions of the pipe. The flange adapter assemblies shall be connected with corrosion resisting bolts and nuts of Type 316 Stainless Steel as specified in ASTM A726

and ASTM A307. All bolts shall be tightened to the manufacturer's specified torques. Bolts shall be tightened alternatively and evenly. After installation apply a bitumastic coating to bolts and nuts.

3.02 INSTALLATION

- A. High Density Polyethylene (HDPE) Pipe shall be installed in accordance with the instruction of the manufacturer, as shown on the Drawings and as specified herein. A factory qualified joining technician as designated by the pipe manufacturer shall perform all heat fusion joints.
- B. HDPE shall be installed either by Open Trench Construction or Directional Bore Method as outlined in Section 3.02 – Installation, Item P – Open Trench Installation or Item Q – Directional Bore Installation.
- C. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe. Pipe or fitting shall not be dropped. All pipe or fitting shall be examined before installation, and no piece shall be installed which is found to be defective. Any damage to the pipe shall be repaired as directed by the Engineer. If any defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner by the contractor, at his own expense.
- D. Under no circumstances shall the pipe or accessories be dropped into the trench or forced through a directional bore upon "pull-back".
- E. Care shall be taken during transportation of the pipe such that it will not be cut, kinked or otherwise damaged.
- F. Ropes, fabric or rubber protected slings and straps shall be used when handling pipes. Chains, cables or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe.
- G. Pipes shall be stored on level ground, preferably turf or sand, free of sharp objects, which could damage the pipe. Stacking of the polyethylene pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.
- H. Pipe shall be stored on clean level ground to prevent undue scratching or gouging. The handling of the pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. The maximum allowable depth of cuts, scratches or gouges on the exterior of the pipe is 5 percent of wall thickness. The interior pipe surface shall be free of cuts, gouges or scratches.
- I. Pipe shall be laid to lines and grade shown on the Drawings with bedding and backfill as shown on the Drawings.

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- J. When laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by fabricated plugs, or by other approved means.
 - K. Sections of pipe with cuts, scratches or gouges exceeding 5 percent of the pipe wall thickness shall be removed completely and the ends of the pipeline rejoined.
 - L. The pipe shall be joined by the method of thermal butt fusion, as outlined in PART 3 – Execution, Section 3.1 Joining Method. All joints shall be made in strict compliance with the manufacturer’s recommendations.
 - M. Mechanical connections of the polyethylene pipe to auxiliary equipment such as valves, pumps and tanks shall be through flanged connections which shall consists of the following:
 - 1. A polyethylene flange shall be thermally butt-fused to the stub end of the pipe.
 - 2. A 316 stainless steel back up ring shall mate with a 316 stainless steel flange.
 - 3. 316 stainless steel bolts and nuts shall be used.
 - N. Flange connections shall be provided with a full-face neoprene gasket.
 - O. All HDPE pipe must be at the temperature of the surrounding soil at the time of backfilling and compaction.
 - P. If a defective pipe is discovered after it has been installed, it shall be removed and replaced with a sound pipe in a satisfactory manner at no additional cost to the Owner. All pipe and fittings shall be thoroughly cleaned before installation, shall be kept clean until they are used in the work and when laid, shall conform to the lines and grades required.
 - Q. Open Trench Installation:
 - 1. Wastewater Standards and Specification, Section 4 – Trench Excavation and Backfill shall apply in its entirety.
 - 2. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16-in per foot of length. If a piece of pipe fails to meet this requirement check for straightness, it shall be rejected and removed from the site. Laying instructions of the manufacturer shall be explicitly followed.
 - 3. Good alignment shall be preserved during installation. Deflection of the pipe shall occur only at those places on design drawings and as approved by the Engineer. Fittings, in addition to those shown on the Drawings, shall be used only if necessary or required by the Engineer.
 - 4. Each length of the pipe shall have the assembly mark aligned with the pipe previously laid and held securely until enough backfill has been placed to hold the pipe in place. Joints shall not be “pulled” or “cramped”.
 - 5. Precautions shall be taken to prevent flotation of the pipe in the trench.
 - 6. When moveable trench bracing such as trench boxes, moveable sheeting, shoring

or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the backfill. Trench boxes, moveable sheeting, shoring or plates shall not be allowed to extend below top of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, pipe bedding shall be placed to fill any voids created and the backfill shall be recompacted to provide uniform side support for the pipe.

7. Restrained joints shall be installed where shown on the Drawings or as directed by the Engineer.

R. Directional Bore Installation:

1. Horizontal Directional Drilling (HDD) is permitted and must be performed by a qualified Contractor. Contractor references describing prior experience with similar type projects shall be submitted to the Engineer for approval. All personnel shall be fully trained in their respective duties as part of the directional drilling crew and in safety.
2. Contractor will submit specifications on directional drilling equipment to be used to ensure that the equipment will be adequate to complete the project. The directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the bore and pullback the pipe, a drilling fluid mixing & delivery system of sufficient capacity to successfully complete the crossing, a guidance system to accurately guide boring operations and trained and competent personnel to operate the system. All equipment shall be in good, safe operating condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this project.
 - a. DRILLING RIG: The directional drilling machine shall consist of a hydraulically powered system to rotate, push and pull hollow drill pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the crossing. The hydraulic power system shall be self-contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor and record maximum pull-back pressure during pull-back operations.
 - b. DRILL HEAD: The drill head shall be steerable by changing its rotation and shall provide the necessary cutting surfaces and drilling fluid jets.
 - c. MUD MOTORS (if required): Mud motors shall be of adequate power to turn the required drilling tools.
 - d. DRILL PIPE: Shall be constructed of high quality 4130 seamless tubing, grade D or better, with threaded box and pins. Tool joints should be hardened to 32-36 RC.

- e. GUIDANCE SYSTEM: The Guidance System shall be of a proven type and shall be setup and operated by personnel trained and experienced with this system. The Operator shall be aware of any magnetic anomalies and shall consider such influences in the operation of the guidance system if using a magnetic system.
3. Specifications on material to be used shall be submitted to Engineer. Material shall include the pipe, fittings and any other item which is to be an installed component of the project.

3.03 CLEANING

At the conclusion of the work, thoroughly clean all of the new pipe lines to remove all dirt, stones, pieces of wood or other material which may have entered during the construction period by forcing a cleaning swab through all mains 6" or greater. Flushing velocities shall be a minimum of 2.5 feet per second. All flushing shall be coordinated with the County Sewer Inspector and the water service provider (depending on the water service area). Debris cleaned from the lines shall be removed from the job site.

3.04 TESTING

- A. Pressure testing shall be conducted per Manufacturer's recommendations and as approved by the Engineer.
- B. All HDPE force mains shall be field-tested. Contractor shall supply all labor, equipment, material, gages, pumps, meters and incidentals required for testing. Each force main shall be pressure tested upon completion of the pipe laying and backfilling operations, including placement of any required temporary roadway surfacing.
- C. All mains shall be tested at 150 percent of the operating design pressure of the pipe unless otherwise approved by the Engineer.
- D. Pressure testing procedure shall be per Manufacturer's recommendations or as follows:
 1. Fill line slowly with water. Maintain flow velocity less than 2 feet per second.
 2. Expel air completely from the line during filling and again before applying test pressure. Air shall be expelled by means of air release valves at points of highest elevation.
 3. Apply initial test pressure and allow to stand without makeup pressure for two to three hours, to allow for diametric expansion or pipe stretching to stabilize.
 4. After this equilibrium period, apply the specified test pressure and turn the pump off. The final test pressure shall be held for one to three hours.
 5. Upon completion of the test, the pressure shall be bled off from a location other than the point where the pressure is monitored. The pressure drop shall be witnessed by the resident project representative and Barrow County representative at the point where the pressure is being monitored and shall show on the recorded pressure read-out submitted to the Engineer of Record.

- E. Allowable amount of makeup water for expansion during the pressure test shall conform to Chart 6, Allowance for Expansion Under Test Pressure, Technical Report TR 31/9-79, published by the Plastic Pipe Institute (PPI). If there are no visual leaks or significant pressure drops during the final test period, the installed pipe passes the test.
- F. If any test of pipe laid disclosed leakage significant pressure drop greater than the manufacturer's recommended loss, the Contractor shall, at his/her own expense, locate and repair the cause of leakage and retest the line. The amount of leakage, which will be permitted, shall be in accordance with AWWA C600 Standards.
- G. All visible leaks are to be repaired regardless of the amount of leakage.
- H. The Contractor must submit his plan for testing to the Engineer for review at least 10 days before starting the test and shall notify County Inspector a minimum of 48 hours prior to test.

END OF SECTION

SECTION 11 SEWER SERVICE CONNECTIONS

PART 1 GENERAL

1.01 SCOPE

The work covered by this Section shall consist of furnishing and installing service connections in the sewers, of the *size* and type shown on the Drawings and specified herein.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Service connections shall be made from the side at 45 degrees of the sewer line using minimum 6-inch diameter pipe as shown on the Drawings. Service pipe shall be of the same material and quality as the main sewer line.
- B. The service connection shall extend from the sewer line to the edge of the permanent easement or right-of-way and be plugged.
- C. If the service connection ends in rock, the Contractor shall excavate the rock an additional 10 feet beyond the plugged end.
- D. Connection of service lines or risers to sewer line shall be by means of standard tees or wyes, or as indicated on the Drawings.

PART 3 EXECUTION

3.01 INSTALLATION

Laying of service connection lines shall be in accordance with Section 8 of these Specifications.

END OF SECTION

SECTION 12 CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SCOPE

- A. The Contractor shall furnish all labor, materials, equipment and miscellaneous items as necessary for the installation of a complete chain link fence system around the sewage pumping stations. Fencing shall be installed in the location as shown on the Drawings in complete conformity with the manufacturer's written recommendations and as specified herein.
- B. Security fencing for the Contractor is at Contractor's option and is not included as part of the work specified.

1.02 DELIVERY AND HANDLING

- A. Deliver materials with the manufacturer's tags and labels intact.
- B. Handle and store materials in such a manner that will avoid damage.

1.03 STORAGE AND PROTECTION

Provide storage and protection in accordance with the manufacturer's requirements.

1.04 QUALITY ASSURANCE

- A. Standards of manufacturer shall comply with the standards of the Chain Link Manufacturers Institute and these Specifications.
- B. Provide fencing as a complete unit produced by a single manufacturer including the required erection accessories, fittings and fasteners.

PART 2 PRODUCTS

2.01 GENERAL

- A. Overall height for new fencing shall be seven feet including three strands of barbed wire on malleable iron post tops. Posts shall be set at no more than 10 foot centers, a full three feet deep in concrete footings, poured the full size of the holes as excavated. Corner posts shall have the necessary strut and tie bracing. Gates shall be provided of the size and at the locations indicated on the Drawings.
- B. Where fencing crosses ditches, steep grades, and other unusual conditions, make special provisions to insure that the security, appearance, maintainability and permanence of the standard fencing are equalled or exceeded.

2.02 MATERIALS AND CONSTRUCTION

- A. Fence Mesh: 9 gauge wire, woven to 2-inch squares, galvanized after weaving, six foot

wide roll. Continuous tension wire shall be provided at the lower edge of the mesh:

- B. Line Post: 2-1/2-inch O.D. Galvanized Pipe (3.65 #/ft.).
- C. Corner Post: 3-inch O.D. Galvanized Pipe (5.79 #/ft.).
- D. Gate Post: 4-inch O.D. Galvanized Pipe (9.11 #/ft.).
- E. Top Rail: 1-5/8-inch O.D. Galvanized Pipe (2.27 #/ft.) with extra long pressed steel sleeves.
- F. Gates shall be supplied with heavy-duty latches, keepers and heavy duty hardened bronze padlocks with duplicate keys.
- G. Gate Frames: 2-inch O.D. Galvanized Pipe Frame (2.72 #/ft.).
- H. Barbed wire shall consist of three strands of 12 gauge wire, with 4-point pattern barbs, galvanized after weaving.
- I. Concrete shall be furnished in accordance with the requirements shown in Section 4 of these Specifications.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Fence installation shall not be started before the final grading is completed, with finish grade elevations established, unless otherwise permitted.
- B. Excavation: Drill holes of diameters and spacings shown, for post footings in firm, undisturbed or compacted soil.
 - 1. Excavate holes to the minimum diameters as recommended by fence manufacturer.
 - 2. Excavate hole depths approximately 3-inches lower than the post bottom, with bottom of posts set not less than 36-inches below the surface when in firm, undisturbed soil.
 - 3. If solid rock is encountered near the surface, drill into rock at least 12-inches for line posts and at least 18-inches for end, pull corner, and gate posts. Drill hole at least 1-inch greater diameter than the largest dimension for the post to be placed. If solid rock is below soil overburden, drill to full depth required. Penetration into rock need not exceed the minimum depths specified above.
- C. Setting Posts: Remove loose and foreign materials from sides and bottoms of holes and moisten soil prior to placing concrete.
 - 1. Center and align posts in holes 3-inches above bottom of excavation.
 - 2. Place concrete around posts in a continuous pour and vibrate or tamp for consolidation. Check each post for vertical and top alignment and hold in position during placement and finishing operations.

3. Trowel finish tops of footings and slope of dome to direct water away from posts. Extend footings for gate posts to the underside of bottom hinge. Set keeps, stops, sleeves and other accessories into concrete as required.
 4. Grout-in posts set into sleeved holes, concrete constructions or rock excavations with non-shrink Portland cement grout or other acceptable grouting material.
- D. Concrete Strength: Allow concrete to attain at least 75 percent of its minimum 28 day compressive strength, but in no case sooner than seven days after placement, before rails, tension wires, barbed wire or fabric is installed. Do not stretch and tension fabric and wires and do not hang gates until the concrete has attained its full design strength.
 - E. Top Rails: Run rail continuously through post caps or extension arms, bending to radius for curved ntns. Provide expansion couplings as recommended by fencing manufacturer.
 - F. Brace Assemblies: Install braces so posts are plumb when diagonal rod is under proper tension.
 - G. Tension Wire: Install tension wires by weaving through the fabric and tying to each post with not less than 6 gauge galvanized wire or by securing the wire to the fabric.
 - H. Fabric: Pull fabric taut and tie to posts, rails and tension wires. Install fabric on security side of fence and anchor to framework so that fabric remains in tension after pulling force is released.
 - I. Repair damaged coatings in the shop or during field erection by recoating with manufacturer's recommended repair compound, applied per manufacturer's directions.
 - J. Stretcher Bars: Thread through or clamp to fabric 4-inches on center and secure to posts with metal bands spaced 15-inches on center.
 - K. Barbed Wire: Install three parallel wires on each extension arm; on security side of fence, unless otherwise indicated. Pull wire taut and fasten securely to each extension arm.
 - L. Tie Wires: Use U-shaped wire appropriate for the diameter of pipe. Attach pipe and fabric firmly with tie wire ends twisted at least two full turns. Bend ends of wire to minimize hazard to persons or clothing.
 - M. Fasteners: Install nuts for tension band and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.02 CLEANING

Perform cleaning during installation of the work and upon completion of the work. Remove from site all debris and equipment. Repair all damage resulting from chain link fence system installation.

END OF SECTION

SECTION 13 SUBMERSIBLE PUMPS

PART 1 GENERAL

1.01 SCOPE

- A. Work described in this Section includes furnishing all labor, materials, equipment, tools and incidentals required for a complete and operable installation of all submersible pumps, motors and controls. All equipment shall be installed, adjusted, tested and placed in operation in accordance with these Specifications and the manufacturer's recommendations.
- B. Associated wet well, piping, valves and valve vault shall be as specified in Sections 8 and 9.

1.02 QUALIFICATIONS

The pump manufacturer shall have similar units in operation for a minimum of five years in the United States.

1.03 DESIGN REQUIREMENTS

- A. Pumps shall be totally submersible, electric motor driven, non-clog, sewage pumps
- B. The pump manufacturer shall review design and layout drawings to insure that installation arrangements are suitable for their equipment. Any potential conflicts or recommended modification shall be noted on the shop drawings or by a pre-submittal request for information if appropriate. Any modifications required to satisfy manufacturer's recommendations shall be at the Contractor's expense.
- C. Operating requirements for pumps shall be as shown in Table 1 of this Section.
- D. The operating range of the pump shall include minimum head, rated and shut-off conditions. The pumps shall be non-overloading throughout this operating range.
- E. Pumps with cooling jackets shall allow for continuous, unsubmerged operation without supplementary cooling. Pumps without cooling jackets shall allow continuous operation with a minimum submergence of one-half the stator housing height. Pumps shall be capable of running continuously at design capacity and head for a period of at least two hours with a water level at the top of the pump volute without overheating or damage to seals or watertight integrity.
- F. Pump design shall incorporate an automatic discharge connection, allowing each unit to be removed for inspection or service by simply lifting the pump. Re-connection shall require only lowering of the pump into position.

1.04 FACTORY TESTING

The pump manufacturer shall conduct full scale, full range factory performance tests with respect to capacity, head and horsepower on each of the pump units to be provided on

this Project. Certified test reports shall be submitted for approval, prior to shipment of the pumps. Tests shall be conducted in accordance with applicable Hydraulic Institute standards for acceptance Level "A"

1.05 SUBMITTALS

- A. Submit shop drawings for all equipment furnished. Specific submittal information shall include:
 - 1. Pump manufacturer's name, pump size or model number, weight and a descriptive bulletin of the pump to be furnished.
 - 2. Outline dimension drawings of the pump.
 - 3. Pump characteristic curves showing head capacity and horsepower, including minimum head, rated and shutoff conditions.
 - 4. Motor manufacturer's name, motor horsepower, RPM and frame size, weight and descriptive bulletin of the motor to be furnished. Include motor manufacturer's certified dimension sheet that lists motor features and include typical motor data sheet.
 - 5. Control panel schematics, panel dimensions and layout, and product data sheets.
- B. Operation and maintenance manuals shall be furnished for the equipment.

1.06 STORAGE AND PROTECTION

- A. Pumps and accessories shall be stored and protected in accordance with the manufacturer's recommendations.
- B. Pumps shall be completely drained prior to shipment. Suction and discharge ports shall be provided with plastic plugs. Each pump shall be secured to a wooden skid to facilitate handling and storage.

1.07 QUALITY ASSURANCE

The manufacturer shall provide a written certification to the Engineer that all equipment furnished complies with all applicable requirements of these Specifications.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

Pumps shall be as manufactured by Flygt.

2.02 MATERIALS AND CONSTRUCTION

- A. Pump Construction
 - 1. All major parts, such as the stator casing, oil casing, volute, sliding bracket and discharge connection shall be of gray iron. All exposed bolts and nuts shall be stainless steel. All mating surfaces of major parts shall be machined and fitted with rubber O-ring seals where watertight sealing is required. All parts shall be

interchangeable and watertight sealing shall not require additional machining of replacement parts, sealing compounds, or the application of specific torques to connectors.

2. No portion of the pump unit shall bear directly on the floor of the wet well. There shall be no more than one 90 degree bend allowed between the volute discharge flange and station piping.
3. A sliding guide bracket shall be an integral part of the pump unit. The volute casing shall have a machined discharge flange which automatically connects directly to, or through an intermediate coupling to a discharge base. The discharge base shall be bolted to the floor of the sump and shall have a flanged connection to the discharge piping. There shall be no need for adjustment, fasteners, clamps, or other devices to connect the pump to the discharge base.

B. Impeller

1. A wear ring system shall be installed to provide efficient sealing between the volute and impeller. The impeller shall be gray cast iron, BN 200 minimum, of non-clogging design, capable of handling solids, fibrous material, heavy sludge and other matter found in normal sewage applications.
2. The impeller shall be constructed with a long throughlet without acute turns. The impeller shall be dynamically balanced. Static and dynamic balancing operations shall not deform or weaken it. The impeller shall be a slip fit or taper fit to the shaft and key driven. Non-corroding fasteners shall be used.

C. Abrasion Resistance: All parts exposed to abrasive wear, case and impeller shall have a minimum of Brinell hardness of 200.

1. Each pump shall be provided with a mechanical, rotating shaft seal system running in an oil reservoir having separate, constantly hydro-dynamically lubricated, lapped seal faces. The lower seal unit between the pumps and oil chamber shall contain one stationary and one positively driven, rotating tungsten-carbide or silicon-carbide ring. The upper seal unit between the oil sump and motor housing shall contain one stationary tungsten-carbide to silicon-carbide ring and one positively driven rotating carbon ring.
2. Each interface shall be held in contact by its own independent spring system, supplemented by external liquid pressures. The seals shall require neither maintenance nor adjustment, but shall be easily inspected and replaceable. No seal damage shall result from operating the pumping unit out of its liquid environment. The seal system shall not rely upon the pumped media for lubrication. The oil reservoir shall have a drain and inspection plug, with positive seal, which shall be easily accessible from outside the pump.
3. A leakage sensing system shall be provided to detect the intrusion of moisture in either the seal chamber or stator housing.

2.03 GUIDE BARS

Guide bars shall be galvanized pipe or structural section attached to the automatic discharge connection at their lower end and to an upper guide bar bracket at their upper end. Intermediate guide bar supports shall be provided as required to insure a rigid installation. Guide bars shall not support any of the weight of the pump.

2.04 MOTOR

A. Pump Motor

1. Pump motors shall be designed in accordance with the standards of NEMA to operate at a standard 40 degree C ambient temperature.' The motor shall be designed for continuous duty capable of sustaining a minimum of 15 evenly spaced starts per hour. Refer to Table 1 for additional pump characteristics.
2. The motor shall be housed in a watertight casing. The pump shaft shall be a one-piece, solid shaft of AISI 400 Series stainless steel or C1034 carbon steel and shall be completely isolated from the pumped liquid.
3. The shaft shall be supported above and below the rotor by anti-friction bearings designed to provide long life and minimize shaft deflection. At least one bearing shall be double row type. Bearings shall have a minimum AFBMA B10 life of 40,000 hours.
4. The design may, if required, incorporate a positive, circulated cooling system to cool the motor. Passages for cooling media, where used, shall be adequately dimensioned to prevent clogging.
5. Thermal sensors shall be provided to monitor stator temperature. One thermal switch shall be imbedded in the end coils of each stator winding. The thermal switch shall be used in conjunction with, and in addition to, external motor protection and shall be wired into the control panel.
6. Provide a sensor to detect moisture in the stator housing of all pumps.
7. Motors shall have a maximum rotating speed of 1,800 RPM.
8. Motors shall be 3-phase, 60 Hz, 230/460 volt electric current.

B. Cable

1. Cable shall be suitable for submersible pump applications and this shall be indicated by a code or legend permanently embossed on the cable. Cable sizing shall conform to NEC specifications for pump motors.
2. The cable entry sealing fitting shall relieve stress on conductors and provide a watertight and submersible seal, without the use of sealing compounds and without the application of specific torques to connectors. The conductors shall connect to a terminal board which shall be provided with a moisture-tight seal between the cable entry junction chamber and the motor.

2.05 CONTROLS

- A. Supplier: All controls specified shall be furnished by the pump manufacturer.
- B. Pump Control Panel
 1. Furnish a complete pump control package for each station as specified below and in Table 1, and as associated with the combustible gas detector.
 2. Power Supply: Power supply shall be as shown in Table 1. Each control panel shall have a main disconnect switch. All controls shall operate on 120 volts maximum. Provide a suitably sized control power transformer, 120/240 volt secondary, with primary and secondary overcurrent protection. Provide control power transformer spare capacity and 2 pole, 240 volt breaker sized per Table 1 to supply generator accessories, or minimum 3 kVA spare capacity for installations with no on-site generator. In addition, provide 4-20 amp 1 pole breakers to supply other station auxiliary devices. Equip one auxiliary circuit with front panel On/Off selector (area light).
 3. Provide motor protection relay for each phase to protect the motor against phase loss, undervoltage, overvoltage, phase unbalance and phase reversal.
 4. Starters: NEMA rated, circuit breaker combination type, with overcurrent protection in each phase. Interrupting capacity is a minimum of 25,000 amperes symmetrical. Starters are reduced voltage type, either autotransformer (set on 80 percent tap) or solid state.
 5. Surge Protection: Equip each panel with main panel protection equal to Advanced Protection Technologies TE Thousand Series.
 6. Relays: Heavy duty industrial control type, 10 amp 600 volt reversible contacts, equal to Square D Class 8501 Type X.
 7. Programmable Logic Controller (PLC): At the manufacturer's option a PLC may be used to accomplish control logic. Provide a minimum of 10 percent spare I/O points, interposing relays as specified above for external status/control signals, and hand held programmer. Acceptable manufacturers are Allen-Bradley, General Electric, Square D, Texas Instruments and Westinghouse.
 8. Selectors and Pushbuttons: Heavy duty, oil-tight with octagonal ring.
 9. Provide a means to automatically transfer service to the on-site generator or manually transfer service to the generator receptacle, as appropriate.
 10. Indicating Lights: Heavy duty, oil-tight, transformer type with lens colors as follows:

Color	Function
Red	Motor Run
Green	Motor Stop
Blue	Call to Run
Amber	Alarm/Fault
White	Control Power On

11. Panel Construction: Route all wiring in Panduit or similar wireways. Protect all wiring across panel hinges. Provide numbered terminal strips for all field wiring terminations. Use barriers to separate 480 volt from 120 and lower voltage sections.
 12. Provide accommodations for combustible gas detector specified in this Section.
 13. Control panel shall be free-standing suitable for pad mounting.
- C. Alarm Horn: Alarm horn shall be weatherproof, flush-mounted on side end of the control panel, and shall be equal to Federal Signal Model 350.
- D. Alarm Light: Shall be NEMA 4X red, weatherproof, flush-mounted on top of the control panel, and shall be equal to Model LRX-40 as manufactured by Ingram Products.
- E. Enclosures: Control panels shall be housed in NEMA 3R rated enclosure. The enclosure shall provide temperature and climate control suitable for the equipment furnished in the enclosure.
- F. Liquid Level Sensors: Level sensing and monitoring shall be accomplished utilizing a MultiTrode probe, specifically designed for wastewater applications. Ten (10) sensors will be spaced along the length of the probe assembly, and each will be individually connected to a correspondingly numbered PVC/PVC .75mm flexible cable. The probe cable shall be run in a separate conduit away from any high voltage cables. The cable will be encoded with number and text along the entirety of the cable and at intervals not greater than 200mm, for identification. The flexible cables shall be capable of supporting the weight of the probe and cable, without the need for additional support. The cable shall be secured to the top of the probe by a synthetic rubber compression fitting. The probe shall be mounted and installed per the manufacturer's specifications.
- G. Downloadable Control/Communicator
1. Provide one downloadable control/communicator in each pumping station control panel. Provide 12 volt, 6 ampere-hour battery back-up. The unit shall be configured to automatically notify Barrow County operating personnel of the following conditions:
 - a. High Wet Well Level
 - b. Loss of normal electrical power (from automatic transfer switch, normally open contact close on loss of utility power., as applicable)

c. Low Wet Well Level

2. The Contractor shall arrange with the local telephone company to provide voice-grade dial-up telephone line to the pumping station. The telephone line shall terminate within the control panel in close proximity to the downloadable control/communicator.

2.06 ACCESSORIES

A. Lifting Cable

1. Provide each pump with a minimum of four feet of galvanized steel lifting chain fitted to the top of each pump. Size chain for a minimum of 75 percent greater than the pump weight.
2. Provide nylon road and lifting device equal to Flygt's "Grip Eye" system. The length of rope shall accommodate wet well depth.

B. Aluminum Floor Doors: Provide as specified in Section 8 of these specifications.

C. Combustible Gas Detector

1. Provide a location on the control panel uni-strut for a future combustible gas detector (CGD) at each pump station.
2. The Contractor shall provide a 2-inch conduit between the wetwell and the future CGD analyzer.
3. Power for the CGD analyzer shall be provided from the mini power zone.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Equipment Installation: All equipment shall be installed in accordance with approved shop drawings, the manufacturer's recommendations and these Specifications.
- B. Anchorage: Stainless steel anchor bolts, nuts and washers, as well as any templates necessary for setting the anchorage, shall be furnished by the equipment manufacturer. Placement of the anchor bolts shall be done by the Contractor from certified dimension shop drawings supplied by the equipment manufacturer.
- C. Leveling and Grouting
 1. Level and align pump and motor in accordance with the respective manufacturer's published data.
 2. Grout pump and discharge base with non-shrink grout in accordance with the ACI and the equipment manufacturer's and grout manufacturer's published specifications.
- D. Floor Doors: Floor doors shall be integrally cast into the top of the manhole. The pump manufacturer shall verify the size and location with the Contractor prior to installation

of each floor door. Floor doors shall be cast into concrete in accordance with the manufacturer's recommendations.

- E. The wet well is classified Class I, Division 1, Group D. Therefore, perform all electrical work in accordance with Article 5.01 of the National Electrical Code, including sealing off conduit air tight.

3.02 INSPECTION AND TESTING

Following installation, operating tests will be performed demonstrating to the Engineer that each mechanism and the system as a whole will function in a satisfactory manner. The Contractor shall make, at Contractor's own expense, all necessary changes, modifications and/or adjustments required to ensure satisfactory performance.

3.03 CLEANING

Prior to acceptance of the work of this Section, thoroughly clean all installed materials, equipment and related areas.

TABLE 1
SUBMERSIBLE PUMPS

Pumping Station Name	
Rated Capacity, gpm	
Rated TDH, feet	
Maximum Runout Head, feet	
Maximum Capacity at Runout, gpm	
Minimum Shutoff Head, feet	
Motor Voltage/Phase	230/3 or 460/3
Motor Horsepower	
Diameter Solids Handled, inches	3
Type of Control	Duplex
Pump and Power Cable/NEC Classification	Class I, Division 1, Group D
Control Panel Enclosure Type	SS NEMA 3R
Junction Box Type	SS NEMA 4X
Control Panel Designation	CP-*
Level Controls	
Type	Ultrasonic
Low Water Level Alarm	Yes
All Pumps Off	Yes
Lead Pump On	Yes
Lag Pump On	Yes
High Water Level Alarm	Yes

Submersible Pumps

Miscellaneous Control Features	
Elapsed Time Meter for Each Pump	Yes
Alarm Light on Top of Control Panel	Yes
Alarm Horn w/Silence Button on Exterior of Control Panel	Yes
Pump No. 1 Run Light	Yes
Pump No. 2 Run Light	Yes
Pump No. 1 Failure Light	Yes
Pump No. 2 Failure Light	Yes
Pump No. 1 High Temperature Fault Light	Yes
Pump No. 2 High Temperature Fault Light	Yes
Pump No. 1 Moisture Light	Yes
Pump No. 2 Moisture Fault Light	Yes
H-O-A Switch	Yes
Automatic Pump Alternation	Yes
Pump Sequence Selector	Yes
Lightning Arrestor with Surge Capacitor	Yes
115 Volt Duplex Utility Outlet	Yes
Site Light On/Off Switch	Yes
Adjustable (5-120 second) Time Delay Relay in Lag Pump Starting Circuit	Yes

Pumping Station Name	
Alarm Horn and Alarm Light shall be Activated Simultaneously When any of these Faults Occur	Low Wet Well Level
	High Wet Well Level
	Pump Moisture Faults
	Pump Temperature Faults
	Pump Failures

- To be determined by Developer's design Georgia registered professional engineer and which must meet the approval of Barrow County.

END OF SECTION

SECTION 14 EMERGENCY BYPASS PUMP

PART 1 GENERAL

1.01 SCOPE

- A. Work described in this Section includes furnishing all labor, materials, equipment, tools and incidentals required for a complete and operable installation of all submersible pumps, motors and controls. All equipment shall be installed, adjusted, tested and placed in operation in accordance with these Specifications and the manufacturer's recommendations.
- B. Associated wet well, piping, valves and valve vault shall be as specified in Sections 8 and 9.

1.02 QUALIFICATIONS

The bypass pump system manufacturer shall be Godwin.

PART 2 PRODUCTS

2.01 MATERIALS

- A. The suction and discharge piping for the bypass pump shall be ductile iron pipe, the size to be determined by the design characteristics of the pumping system.
- B. Bypass Pump Station Features
 - 1. Critically Silenced Enclosure: The entire pump and engine assembly shall be completely enclosed with sound attenuated panels
 - 2. Dry running oil bath mechanical seal
 - 3. Diesel or natural gas powered engine (to be determined by the County based on the availability of natural gas near the pump station location)
 - 4. Prime Guard engine control with floats
 - 5. Solar Battery Charger
 - 6. 110 Volt A75 Block Heater
 - 7. 110 Volt Junction Box
 - 8. Skid mounted with 100-gallon fuel tank and lifting bracket
- C. Bypass Pump Telemetry System
 - 1. The Contractor shall provide a Mission Communications Field RTU Model M112 with NEMA 4x enclosure with the following features:
 - a. Include 8 digital inputs
 - b. 2 analog inputs

- c. 1 electronic key reader
- d. 3 outputs
2. The Contractor shall provide a Missions Communications Solar Cell Kit Model M800 with stand.

PART 3 EXECUTION

3.01 INSTALLATION

- A. The Bypass Pumping System shall be connected to the wetwell and valve vault as follows:
 1. The suction line shall be ductile iron pipe that will enter the wetwell at a minimum depth of two feet below grade.
 2. The suction line will extend downward inside the wetwell to the “pumps off” elevation for the pump station
 3. The suction line shall be installed below grade to the bypass pump, then extend 90 degrees vertically to connect to the suction inlet of the bypass pump.
 4. The discharge piping shall be ductile iron pipe.
 5. The discharge pipe will connect to the pump outlet and extend 90 degrees vertically downward to a depth of two feet below grade.
 6. The discharge piping shall extend a minimum two feet below grade to the valve vault, where it will connect to the header for the duplex pump station.

END OF SECTION

ADDITIONAL SPECIFICATION SECTION 01025 MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

This Section describes the methods by which measurement will be made of the quantities for which payment will be made for the project.

1.02 MEASUREMENT OF WORK

- A. WORK shall be measured by the ENGINEER or his representative, with assistance from the CONTRACTOR prior to preparation of a payment request by the CONTRACTOR.
- B. Unit quantities that are measured in place shall be measured monthly. The CONTRACTOR shall give the ENGINEER a minimum of two days notice for making all required measurements.
- C. Materials that must be measured as delivered shall be measured at the time of delivery by the ENGINEER or his representative; the CONTRACTOR shall provide sufficient advance notice so that such measurements can be made.
- D. WORK completed shall be measured for completion against the schedule of values provided by the CONTRACTOR in accordance with the General Conditions. Related work necessary for a complete and operational job, such as relocation of mail boxes removal of trees, relocation of utilities, field engineering, clearing and grubbing, traffic control, etc., not specifically identified as a pay item shall be included in the unit price bid. No additional payments will be made for such activities.

1.03 PROGRESS PAYMENTS

- A. Progress payments shall be as follows:

Mechanical Screening Facilities based on percentage of work complete.
- B. All items of WORK not specifically listed in the Bid Schedule shall be considered incidental to the construction, and the cost of all such work and material shall be included in the prices bid for various items listed.
- C. All items listed for measurement and payment shall include all machinery, plant, materials and labor, etc., to successfully and satisfactorily complete WORK specified.
- D. Payment: The CONTRACTOR will receive payment only for the items listed in the Bid Schedule of this contract, and no separate payments will be made for the work under any section of the CONTRACT DOCUMENTS except as provided for in the Bid Form. Where measurements are required to be made by the ENGINEER for the payment of a pay item, the failure of the CONTRACTOR to give adequate notification or failure of the CONTRACTOR

to give the ENGINEER assistance for the measurement shall result in the forfeiture of payment for the work or item which was not measured.

- E. WORK to be paid for as a "Lump Sum" shall be measured for completion against the "Schedule of Values" provided by the CONTRACTOR. The "Schedule of Values" shall be submitted at the preconstruction conference and shall include quantities and prices of items aggregating the total "Lump Sum" and will subdivide the work into component parts in sufficient detail to serve as the basis for progress payments during construction.

PART 2 PRODUCTS

2.01 STORED MATERIALS

Partial payment shall be made for approved materials stored at the project site, provided invoices for said materials are furnished in accordance with payment request submittal.

PART 3 EXECUTION

3.01 MOBILIZATION

The basis of payment for this item shall be lump sum.

3.02 MECHANICAL SCREENING FACILITIES

The basis of payment for this item shall be lump sum. Payment includes but is not limited to all labor and equipment for the following items: construction staking, site preparations including clearing and grubbing, removal and disposal of rock, rubble and other debris, all excavations, backfill and grading, temporary and permanent erosion control, gravel roadway, installation of site power lines, sanitary sewer line demolition and replacement, mechanical screen and screen structure, all piping, fittings and valves, setting of equipment and all connections, testing for compaction, all grassing, training and all materials, equipment, electrical controls and associated apparatus and items necessary to execute, make ready for use, and place project into operation.

3.03 MANDATORY BID ALTERNATE "A"

The basis of payment for this item shall be lump sum. This alternate bid item is in addition to the Base Bid totals and corresponds to the installation of a new flow metering system for the two existing influent force mains discharging to the Tanners Bridge Land Application System. Payment includes but is not limited to all labor and equipment for the following items: mobilization, construction staking, site preparations including clearing and grubbing, removal and disposal of rock, rubble and other debris, all excavations, backfill and grading, temporary and permanent erosion control, sanitary sewer line and force main demolition and replacement, manholes, flow meters, all piping, fittings and valves, setting of equipment and all connections, testing for compaction, all grassing, training and all materials, equipment, electrical controls and associated apparatus and items necessary to execute, make ready for use, and place project into operation.

END OF SECTION

ADDITIONAL SPECIFICATION SECTION 11001 MECHANICAL EQUIPMENT GENERAL REQUIRMENTS

PART 1 GENERAL

1.01 SCOPE

The work described by this Section consists of general requirements for furnishing and installing all materials and equipment specified for all items listed herein, and the furnishing of the services of a competent factory representative to supervise and/or inspect the installation and initial operation of all equipment and instruct the OWNER's personnel in the proper use and maintenance of the equipment.

- A. The CONTRACTOR shall furnish, install, test, adjust and paint in accurate, satisfactory, workmanlike manner, all machinery, equipment, apparatus, accessories, and fittings required for the completion of the work in accordance with the Drawings, this Section, other pertinent Sections, and in accordance with the drawings, specifications, and directions for erection furnished by each equipment manufacturer.
- B. The CONTRACTOR shall furnish and install all materials including electric wiring, conduits, and controls not furnished by the equipment manufacturers. The CONTRACTOR's attention is directed to the General Requirements and Section 01300 with reference to requirements for furnished shop drawings.

1.02 CODES AND STANDARDS

- A. The CONTRACTOR shall obtain and pay for all licenses, permits, fees and charges. The CONTRACTOR shall be responsible for all charges for the use of property other than the site of the work for storage of materials or other purposes.
- B. The CONTRACTOR shall comply with all ordinances, laws, regulations, and codes applicable to the work involved. This does not relieve the CONTRACTOR of work shown or specified which may be beyond the scope of such ordinances, laws, regulations and codes.
- C. Regular inspections shall be requested by CONTRACTOR as required by governing codes or regulations.
- D. The Williams-Steiger Occupational Safety and Health Act of 1970, Public Law 91-596, shall apply to the mechanical work.

1.03 SUPERVISORY SERVICES

The periods of installation and initial operation shall be assumed to occur on successive days, unless otherwise stated herein. If the CONTRACTOR fails to arrange his work so that all services may be performed on successive days, he will be required to furnish such services at a later date, at no additional expense to the OWNER. Periods of service on more than one (1) item furnished by the same manufacturer may run concurrently, if so approved and permitted by the ENGINEER. Manufacturers, who are required to furnish supervisory and/or inspection services, shall extend those services to include all equipment furnished by them for the Project, whether listed or not.

1.04 EQUIPMENT BIDS

A. Equipment Manufacturer

Any reference to an item of equipment or material by a specific manufacturer's trade name in these Specifications is intended as a standard. Even though named in the Specifications, equipment offered with smaller or lightweight members, inferior or inefficient mechanism or devices compared to that specified will not be approved for the project. Each bidder is required to state in his bid the name of at least one (1) manufacturer or supplier named in these Specifications for each major item of equipment and his bid price for that item as required in the Proposal. This requirement is to prevent rejection of the bid should a piece of substitute equipment be rejected. Other equipment shall be considered as specified in the Contract Documents, if offered by the bidder under "Substitute Equipment", in the Proposal, provided, it is equal in functional design, mechanical and structural details, to the one specified.

1. Substitute Equipment

Equipment offered under "Substitute Equipment" of the Proposal shall comply with requirements of these Specifications. It shall be the responsibility of the Bidder to determine that equipment offered in the Proposal is in accordance with the Specifications. Substitute equipment offered at a lower price by reason of smaller or inefficient members, inferior or inefficient mechanism or devices will not be considered.

2. Substitute Equipment Bid

The price bid for substitute equipment shall include the cost of all changes in the structure, mechanical, electrical work, and other appurtenances, including engineering costs for redesign, for the accommodation of such equipment, as determined by the ENGINEER, at the expense of the CONTRACTOR.

B. Experience and Manufacturer

It is desired that only equipment which has undergone thorough development as provided by successful service in similar installations for at least five (5) years shall be accepted for installation unless specified elsewhere in these specifications. Manufacturers and/or equipment which does not meet the five (5) year experience period will be considered if the manufacturer or supplier provides a bond or cash deposit which will guarantee replacement of the equipment or process in the event of failure or unsatisfactory service. The amount of bond or cash deposit shall be sufficient to cover all labor and equipment costs for replacement in addition to any costs incurred by the OWNER because of failure or unsatisfactory service. The period of time for which the bond or cash deposit is required shall be two (2) years.

C. Standardization

To avoid a division of responsibility among several manufacturers for items of equipment having functions related to each other or to the same portion of the treatment process, and to avoid unnecessary duplication of replacement parts and service calls by the OWNER, unless otherwise permitted herein, the equipment supplied under any numbered section shall be the product of, or furnished and guaranteed by, one (1) manufacturer.

1.05 EQUIPMENT OBTAINED FROM EQUIPMENT MANUFACTURER

The CONTRACTOR shall obtain all equipment specified, and that required for the safe operation and use of that equipment, from the manufacturer of the equipment, unless excluded by provisions in this paragraph or specifications for the item.

- A. Equipment which is offered in violation of the above provisions will be subject to rejection. In every case, approval of equipment drawings for construction will be withheld until all such materials have been included on the drawings or list of materials to be supplied by the manufacturer.
- B. Unless otherwise stated in the Specifications, the following type of materials shall not be considered to be part of the equipment; connecting piping and valves, motor starters and wiring, steps and manholes installed separately from equipment, finish painting, etc.

1.06 EQUIPMENT APPROVAL

Each manufacturer furnishing equipment shall submit the following information to the ENGINEER for approval.

- A. Six (6) sets of certified drawings, guaranteed performance curves, wiring diagrams, specifications, and lists of electrical controls, including manufacturer's name and catalog number; furnish horsepower, normal full load and maximum load ampere rating of each motor.
- B. Estimated weight of each unit.
- C. Six (6) sets of certified test curves for each pump with a capacity greater than 100 gpm prior to shipment.
- D. List of spare parts and tools furnished with equipment. Unless otherwise specified herein, tools shall be only such special tools required by the particular equipment.
- E. Within six weeks after above approval, six (6) sets of complete installation and operation instructions and parts lists.

1.07 MECHANICAL TESTING

After each unit has been installed and is ready for operation, it shall be operated continuously for a period of 24 hours. During that period, the equipment will be inspected for defects and weaknesses. Parts of the unit which show a defect or weakness, or both, shall at once be removed and be replaced with new parts or be made good in a satisfactory manner, at no additional expense to the OWNER.

- A. Continuous 24 hour tests shall be made after all defects have been remedied, at no additional expense to the OWNER.
- B. After installation and final testing, each equipment manufacturer furnishing supervision and/or inspection services shall make written certification to the ENGINEER and the OWNER that the equipment and controls have been properly installed in accordance with the drawings, specifications, and manufacturer's requirements, and that the required operating and maintenance instructions have been furnished to the ENGINEER.

1.08 PIPING FOR EQUIPMENT

The CONTRACTOR shall furnish completely dimensioned layouts for all piping, fittings, valves, specialties, and other equipment. Deviations from the dimensions shown on the drawings caused by equipment dimensions shall be taken into consideration by the CONTRACTOR and changes in piping, electrical conduit, and other similar items shall be done at no additional expense to the OWNER.

- A. All piping and appurtenances shall be properly supported by a system of hangers, pipe stands, saddles, base ells, and concrete piers as required. Concrete inserts, bolts, anchors, etc., shall be placed in the forms before placing concrete.
- B. Drip piping, 3/4 inch in size, shall be provided for all pumps; use crosses and plugs at all changes of direction. Piping shall be run to nearest drain in a manner which will not constitute a hazard to foot traffic. Furnish plug valve, or stopcock, bleeds for high points in piping for all pumping unit.

1.09 PAINTING

- A. Shop painting shall consist of preparing surfaces in accordance with the requirements of the manufacturer, and applying the manufacturer's standard primer.
- B. Field paint shall be as specified in the Drawings, as applicable.

1.10 OPERATION AND MAINTENANCE MANUALS

Before the equipment is placed in services, six (6) sets of operation and maintenance manuals for the equipment, clean and unused, shall be delivered to the ENGINEER by the CONTRACTOR.

1.11 GUARANTEES

The CONTRACTOR shall guarantee the equipment to be free from defects in workmanship, design, and materials for a period of one (1) year after initial operation begins; the CONTRACTOR shall replace at no additional expense to the OWNER, every defective part, and every part showing undue wear, during that guarantee period. The date of initial operation shall be only after approval by the ENGINEER and shall be furnished in writing to the CONTRACTOR.

1.12 SPARE PARTS

The CONTRACTOR shall allow \$1,000 in his bid for spare parts in addition to those specified for individual pieces of equipment. The CONTRACTOR shall submit a list of spare parts recommended by the manufacturers along with a price list for the ENGINEER's approval.

1.13 MOTORS

Motors for operating mechanical equipment shall satisfy the latest requirements of the Institute of Electrical and Electronic Engineers, American National Standards Institute and the National Electrical Manufacturer's Association. Motors shall be manufactured by General Electric Co., Westinghouse, or equal. All single and three-phase motors (except fan motors which may be of an approved manufacturer's standard) shall be ball bearing, and have either sealed-in lubricant or be designed for external oil or grease lubrications. The equipment manufacturer shall supply motors having sufficient torque to start equipment under load and to accelerate the equipment smoothly and quickly to full speed without exceeding the motor nameplate ratings, including service factor. Motors shall have 1.15 service factor, except totally-enclosed motors unless otherwise specified.

- A. Motors 25 HP and larger shall be equipped with embedded stator thermostats (normally closed) connected internally in series and brought out through motor junction box for connection to starter pilot relay 115V control circuit. Large motor protection will be covered under the paragraph applying to the individual motor.
- B. Motors 1/2 HP and larger shall be three (3) phase, 60 hertz, induction type and be designed for full voltage starting. Motors shall be open drip-proof with Class B insulation for indoor installation. Vertical motors shall have WP-1 enclosure with Class F insulation for outdoor installation.
- C. Motors smaller than 1/2 HP shall be single phase, induction, capacitor-run type, unless otherwise specified. Very small motors, and those for special purposes, may be shaded pole type, their use shall be subject to approval by the ENGINEER.

1.14 PRESSURE GAUGES

- A. Pressure gauges shall be of the Bourdon tube spring type, with dial no less than 4-1/2 inches in diameter with recalibration screws.
- B. Gauges shall have plain cases with screwed ring, finished in black enamel. Gauges shall be installed on the suction and discharge side of all pumps and at other locations where shown on the plans. Gauges, complete with isolating snubbers, shall be Ashcroft, Marsh, Trerice, Taylor or approved equal. Gauges shall have scale ranges to 50% in excess of the operating range of the system they are part of and shall be equipped with a petcock for easy shut-off, and calibrated in feet of water with calibration shown on the face of the gauges. Two test gauges, one calibrated to read from 30 feet of vacuum to a positive pressure of 30 feet and the second calibrated to read from zero to 150 feet positive pressure, shall also be furnished.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.01 VERIFICATION OF CONTRACT PLANS

- A. The Plans indicate certain required pipe sizes and the general arrangement for major piping and equipment. Layout and arrangement for certain other piping systems shall be provided in conformance to the equipment items furnished and shall be verified in the field by the CONTRACTOR. Valves and fittings furnished shall be of such dimensions to allow for the installation of piping substantially as shown on the Plans. In the event it should become necessary to change the location of any of the work due to interference with other work, the CONTRACTOR shall consult with the ENGINEER before making any changes. Any such changes shall be made without added cost to the OWNER. Under no circumstances shall the pipe sizes indicated on the Plans be changed without first having notified the ENGINEER.

- B. The CONTRACTOR shall determine and be responsible for the proper locations and character of all inserts for hangers, chases, sleeves and other openings in the construction required for all mechanical piping work.
- C. The final location of inserts, hangers, etc., required for the mechanical piping installation shall be coordinated with facilities required for other installations to prevent interference.
- D. The final length and location of required pipe connections to all process equipment shall be coordinated to meet the requirements and recommendations of the equipment manufacturer.
- E. The CONTRACTOR shall install no work that directly connects to equipment until such time as complete shop drawings of such equipment have been submitted to and approved by the ENGINEER.
- F. The drawings are essentially to scale as noted but the CONTRACTOR shall refer to other drawings for exact location of partitions, walls, doors, equipment, etc.
- G. The CONTRACTOR, before roughing in any facilities or installation of any equipment, shall consult all drawings, general, mechanical, electrical, etc., and shall inform himself of materials, finishes, location of ceilings, structural members, pipes, ducts, lighting fixtures, conduits, etc., which may affect the installation.
- H. Discrepancies discovered before or after work has started, shall be brought to the attention of the ENGINEER immediately and the ENGINEER reserves the right to require minor changes in the work of any CONTRACTOR to eliminate such discrepancies.
- I. The Plans and Specifications are complementary and what is called for in either one shall be binding as if called for in both.

3.02 NAMEPLATES AND IDENTIFICATION TAGS

Each piece of equipment furnished as a part of the respective mechanical piping system, shall have a standard nameplate securely affixed thereto in a conspicuous place, showing the serial number and the name of the manufacturer. In addition, the nameplate shall show the rated capacity of the unit at specified conditions. Motor nameplates shall show the horsepower, speed and electric current characteristics. The nameplates of a distributing agent will not be acceptable.

3.03 PAINTING

All equipment, motors, drive assemblies and bases shall be furnished with a factory paint finish which is compatible with the paint specified in the Drawings, as applicable. Pipe materials shall be factory primed as specified for the particular pipe system hereinafter. All field painting, touch-up paint, and stenciling is specified in the Drawings, as applicable.

3.04 PRESSURE TESTING

- A. All mechanical piping systems shall be pressure tested after installation. All liquid systems shall be tested hydrostatically or pneumatically at the CONTRACTOR's option. If air pressure is used for testing, the CONTRACTOR shall be responsible for all safety precautions necessary to prevent possibility of personal injury in the event of blow-off or material failure during test.

- B. All systems shall be tested at the pressure level specified hereinafter, or if not specified, at a pressure of at least 150 percent of maximum operating pressure. After bringing the system to the required pressure, it shall be left for at least one hour and shall show no loss in pressure due to leakage.
- C. If leakage is detected, the cause shall be determined and corrected, and the test shall be conducted again at the expense of the CONTRACTOR.

3.05 HVAC TEST AND BALANCE

Test and balance work shall be accomplished for all HVAC equipment and complete systems in accord with AABC standards including performance testing of heating and cooling capacities.

END OF SECTION

ADDITIONAL SPECIFICATION SECTION 11125 MECHANICALLY CLEANED PIVOT STAND BAR SCREEN

PART 1 GENERAL

1.01 DESCRIPTION

- A. This section consists of the furnishing and installing of all materials, equipment and accessories and the performing all labor necessary for the complete installation of one (1) mechanically cleaned spiral screen for collection and removal of gross solids from municipal wastewater, as shown or specified.

- B. The spiral screen shall be of the semi-cylindrical type or approved equivalent. The screen will be provided with a controller for operation and control. The equipment will be installed as shown on the plans, as recommended by the supplier and in compliance with all OSHA, local, state and federal codes and regulations.

- C. The equipment shall include, but not be limited to, the following:
 - a. Spiral Assembly
 - b. Screen Basket
 - c. Transport Tube
 - d. Press Zone
 - e. Discharge Section
 - f. Drive Assembly
 - g. Pivot Stand
 - h. Electrical Controls

The screen shall be completely shop assembled, tested and adjusted prior to shipment.

D. OPERATING REQUIREMENTS

- 1. The spiral screen shall be designed for continuous duty under the conditions set forth herein. The design shall also ensure that all maintenance to the mechanism can be accomplished at or above the operating floor level. The spiral screen will be activated by a timer or manually.

- 2. Equipment shall be designed and operable for the following conditions:

Flow Capacity:

Maximum 2.74 MGD

Channel Dimensions:

Width 1.67 ft

Depth 4.0 ft

Maximum upstream water depth 29 in

- E. All stainless steel shall be 316 unless otherwise noted.

1.02 REFERENCES

- A. Support system and screen materials of construction shall, as applicable, meet the requirements of the following industry standards:

- 1. American Society for Testing and Materials (ASTM) A36: Standard Specification for Carbon Steel Plate.
- 2. American Iron and Steel Institute (AISI) 304 Stainless Steel.
- 3. American Iron and Steel Institute (AISI) 316 Stainless Steel.

- B. Motor controllers shall, as applicable, meet the requirements of the following regulatory agencies:

- 1. National Electrical Manufacturer's Association (NEMA) Standards.
- 2. National Electrical Code (NEC).
- 3. Underwriters Laboratory (UL and cUL).

1.03 ENVIRONMENTAL CONDITIONS

Equipment to be furnished under this section shall be suitable for installation in a wastewater treatment plant serving a predominantly residential community. However, some minor quantities of commercial and industrial wastes may be present in the wastewater. All components shall be suitable for exposure to industrial solvents and petroleum products. Ambient air temperature may range from 15 to 100 degrees F. Ambient wastewater temperatures may range from 55 to 85 degrees F.

PART 2 PRODUCTS

2.01 ACCEPTABLE PRODUCTS

The mechanically cleaned bar screen shall be a Raptor Micro Strainer as manufactured by Lakeside Equipment Corporation or approved equivalent.

2.02 SEMI-CYLINDRICAL SCREEN

A. Screen Basket

1. The screen shall be designed and built to withstand maximum possible static hydraulic forces exerted by the liquid to the screen. All structural and functional parts shall be sized to prevent deflections or vibrations that may impair the screening, conveying and pressing operations. All submerged components and all components of the screen in contact with the screened solids shall be of stainless steel construction.
2. The screen basket shall be of a semi-cylindrical shape and installed in the housing parallel to the direction of liquid flow. The screen shall be furnished with a 5/8-inch thick minimum upper basket support flange for mating to the screenings screw conveyor body. After welding the face of the screenings basket support flange shall be machined in accordance with paragraph 2.08.F.
3. The minimum diameter of the screening basket shall be 17 inches.
4. The screen basket shall use perforated plate for capturing solids in the wastewater flow stream. The perforated plate screen orifice opening diameter shall be 1/4 inches with an orifice centerline spacing of 5/16 inches. The perforated plate screen shall have a minimum thickness of 0.12 inches for heavy-duty applications to minimize tearing.
5. Stainless steel seal plates or rubber flaps shall be provided with a profile conforming to the channel to prevent flow from by-passing the screen.

B. Screenings Conveyor and Screenings Dewatering Press

1. The semi-cylindrical screen shall be cleaned by a shaftless screw conveyor with helical flights designed to operate and to convey screened material at a 45-degree angle of operation. The shaftless screw conveyor flights for cleaning the screen shall be fabricated with 3/8-inch minimum stainless steel plate and machined in accordance with paragraph 2.08.F. Screw conveyor designs fabricated of material that is not AISI designated stainless steel will not be acceptable for this project. Designs that form the shaftless portion of the screw out of bar stock shall be fabricated from AISI Type 316Ti stainless steel to prevent stress relieving after fabrication and shipment.
2. The screw conveyor flight edges shall be parallel to the face of the perforated screen with a gap not to exceed 0.040 inches.
3. Attached to the shaftless screw conveyor flights the full length of the perforated screen shall be a stainless steel backed brush composed of plastic bristles. Brush shall be attached to the shaftless screw conveyor with stainless steel holder clips and stainless steel fasteners.
4. As material is conveyed into the enclosed transport tube there shall be a transition section from the nominal screen diameter noted in paragraph 2.02.A.3. to a nominal screenings transport tube diameter of 10 inches. The transport tube shall

be fabricated of stainless steel with a wall thickness equal to or greater than that provided by Schedule 10S pipe to minimize deflection.

5. A 3/4-inch thick minimum basket support plate flange shall be welded to the lower end of the screenings transport tube to attach the screen basket and to provide for attachment of the screenings collection hopper. A 3/4-inch thick minimum drive support flange shall be welded to the upper end of the screenings transport tube for attachment of the drive assembly. After all welding of components to the screenings transport tube have been completed the fabrication shall be placed in a lathe to machine the face of the upper drive flange and to machine the face of the lower basket support plate flange for mating the basket in accordance with paragraph 2.08.F.
6. To prevent rotation of the material in the transport tube and to provide maceration of screenings during transport, there shall be a minimum of two (2) 1/4-inch minimum thick stainless steel anti-rotation bars equally spaced along the inside axis of the transport tube. Anti-rotation bars shall be welded to the inside of the transport tube.
7. In the transition section from the screen to the transport tube there shall be two (2) replaceable bearing strips to support the screw conveyor when the unit operates without screenings. These replaceable wear strips shall prevent the transport screw flights from wearing on the anti-rotation bars or on the cleaning brush. The wear strips shall be replaceable without having to remove the screw conveyor from the screenings transport tube for ease of maintenance. Wear strips shall be a special ultra high molecular weight polyethylene material filled with molybdenum disulfide and oil for superior life. The wear strips shall be held in place via a stainless steel backing housing with a bolted connection for ease of field replacement.
8. The transport screw shall change from a helical-flight shaftless design to a helical-flight shafted design just prior to the screen transition section. The shafted screenings transport screw shall have 3/16-inch minimum stainless steel flights that are welded to a 3-inch minimum diameter stainless steel torque tube. Flight thickness shall be increased on the last flights to 3/8-inch in the compaction zone. Where the transport screw passes through the discharge section a reverse stainless steel flight spiral shall be provided to cut off the compacted material plug to drop into the receiving receptacle.
9. The upper screenings conveyor torque tube shall be fitted with a removable stainless steel stub shaft that may be changed for adapting to speed reducers that are produced by various manufacturers. The shaft and screenings screw conveyor torque tube shall be accurately machined in accordance with paragraph 2.08.F. to allow a close running fit for the upper stub shaft. The upper screenings conveyor torque tube shall be fitted with a bolted removable stainless steel stub shaft that may be changed for adapting to speed reducers that are produced by various manufacturers. Welding the upper stub shaft to the screening transport screw conveyor torque tube will not be acceptable for this project.

10. The screen shall be provided with a pivoting support stand allowing for easy removal of the screen basket from the channel for maintenance purposes. To ensure operator safety during servicing of the screen, supports and support stand shall be fabricated from 1/4-inch minimum stainless steel shapes and plates.
11. A compaction zone shall be an integral part of the screenings screw conveyor and transport tube design. The compaction zone shall be designed to form a screenings plug of material and to return water released from the screened material back to the wastewater channel through circular holes that are machined into the screenings transport tube. Compaction zone shall be fabricated from 12 gauge minimum thick stainless steel welded to the screenings transport tube to provide a watertight screenings pressate collection chamber. Compaction zone housings that are non-metallic and which require seals to prevent leakage around the screenings transport tube will not be acceptable for this project. Compaction zone housing shall be furnished with a hinged and sealed access cover held in place with stainless steel latches as well as a removable dewatering section panel inside the dewatering chamber to allow direct access to the screw conveyor should the compaction zone ever become plugged. Designs that require removal of the drive assembly, discharge head or screw conveyor to gain access to the compaction zone will not be acceptable for this project.
12. The screen shall be designed with a minimum height of 101 inches as measured from the channel invert to the lowest point of the discharge chute.

C. Drive Assembly

1. The screw conveyor shall be driven by a direct-connected cycloidal-helical hollow-shaft high-thrust in-line speed reducer as shown on the drawings. The cyclo element of the speed reducer shall be designed to take a 500 percent shock load without damage. The speed reducer manufacturer shall be a member of AGMA. Combination gear motor designs will not be acceptable for this project. The speed reducer shall have a minimum torque rating 15,700 in-lb and a minimum thrust rating of 5,800 lb_r.
2. The speed reducer shall be bolted to the drive adaptor flange at upper end of the screenings transport tube.
3. The speed reducer shall be driven by a field replaceable NEMA C-flanged, 1,800 rev/min, ball bearing, continuous-duty, totally enclosed, fan-cooled motor with leads to a large conduit box for outdoor operation. The reducer shall utilize a taper grip bushing to connect to the drive shaft of the screw conveyor. The use of keys and keyways will not be an acceptable connection method for this project.
4. The electric motor shall be 2 HP, 480 V, 3 Phase, 60 Hz, TEFC, 1.15 S.F., Design B, Class F insulation, 40°C ambient temperature rise, and non-hazardous duty rated.
5. Chain drives, belt drives, hydraulic drives or a separate upper bearing for the transport screw will not be acceptable for this project.

D. Spray Wash Systems

1. Three (3) spray systems shall be provided. Each spray wash system shall be furnished with a control solenoid valve, stainless steel piping and fittings, flexible reinforced PVC hose and nozzles. Piping, fittings and valves shall be 3/4-inch diameter minimum. A plant water strainer shall be provided for the incoming plant water supply. The wash water flow requirements shall be 20 gpm with a minimum pressure of 60 psig. The three (3) spray wash systems shall include:
 - a. Lower spray wash system shall be located near the upper end of the screenings basket just prior to where screenings enter the screw conveyor transport tube. The lower wash system shall have the minimum of six (6) spray nozzles.
 - b. Screenings spray wash system shall be located in the upper section of the transport tube no more than 17 inches from the beginning of the compaction zone to break up and return organic materials to the flow stream and to ensure maximum screenings washing. A minimum of one (1) spray nozzle shall be provided. The screenings spray wash system and screenings screw conveyor shall be designed to prevent washing screenings down the center of the screw conveyor.
 - c. The dewatering chamber flush water system shall periodically clean the compaction and dewatering zone via a stainless steel wash nozzle located in the compaction/dewatering chamber. The dewatering chamber flush water system shall not be a substitute for the screenings washing systems described in paragraphs 2.02.D.1.a. and 2.02.D.1.b.
3. The three (3) solenoid valves shall be 3/4-inch minimum, brass body suitable for 120 VAC operation with rated for non-hazardous duty. Solenoid valves shall be normally closed and rated for up to 100 psig. Solenoid valves shall be slow close type to minimize water hammer. Solenoid valve electrical conduit hub shall be a metallic design. Solenoid valves that use plastic connectors will not be acceptable for this project.
4. Solenoid valves shall be factory installed to a piping manifold to ensure even pressure distribution to each spray wash system. The solenoid valve wiring shall be factory installed to a common junction box on the spray wash manifold for wire nut connection to external power. Conduit and fittings shall be factory installed between the solenoid valves and junction boxes. Junction box, conduit and fittings shall be rated NEMA 4X for non-hazardous locations and NEMA 4/7/9 for an explosion-proof environment.
5. Water strainer shall be provided suitable for a 3/4-inch connection and a maximum flow rate as noted in paragraph 2.02.D.1 and suitable for a maximum pressure as noted in paragraph 2.02.D.1. Water filter shall be a stacked filter element design with washable 80-mesh (200 micron) polyethylene or polypropylene disc elements, polypropylene head and bowl and Buna N gaskets.

2.03 CONTROL SYSTEM

- A. All controls necessary for the fully automatic operation of the semi-cylindrical screen shall be provided.
- B. The electrical control system shall provide for automatic control of the screen via a high liquid level using a liquid level control system in connection with an adjustable time clock. The screen shall operate at a high liquid level and or a pre-determined time sequence to provide a variable time between cleaning operations.
- C. The float switches shall be a hermetically sealed, axially non-position sensitive type, mercury-switch activated and enclosed in a polypropylene housing. The switches shall operate over a narrow switching angle and have a minimum rating of 1 amp at 120 volts. A 20 ft PVC jacketed power cable, weight, grip cord, and stainless steel mounting bracket shall be furnished as part of the switch assembly. For a Class I Division I electrical classification environment the level switching circuit shall be rated intrinsically safe by inclusion of a UL approved switch isolator with relay output. The switch isolator shall be rated for 120-volt service with output contacts rated for 2 amps minimum. A second high-level float switch shall be included for alarm indication and as a backup start switch circuit.
- D. A local-mounted panel suitable for wall mounting shall contain the following items:
 - 1. Door interlocked fused disconnect
 - 2. Process controller complete with LCD operator interface panel providing field settable/adjustable/access to process parameters and for providing specific indications of each type of fault that may occur. Controller ram shall be backed up with non-volatile memory which will load automatically if ram is corrupted.
 - 3. Full voltage reversing starter with overload protection
 - 4. Control power transformer fused primary and secondary with 120VAC transient voltage surge suppressor (TVSS)
 - 5. Full voltage LED pilot lights for the following:
 - a. Control power on (White)
 - b. Multifunctional overload shutdown/screen fault (Red)
 - c. High level (Amber)
 - 6. E-stop push button (Red)
 - 7. Re-set push button (Black)
 - 8. Hand-Off-Auto selector switches for the following:
 - a. Screen drive
 - b. Common wash system solenoid valves
 - 9. Forward-Off-Reverse selector switch (spring return to center) for screen drive
 - 10. Door-mounted elapsed time meter

11. Remote dry contact outputs for the following:
 - a. Screen Running
 - b. Malfunction alarm
 - c. High water level alarm
12. Weather protection system heat tracing circuit breaker
13. Plant water heat tracing (250 WATTS MAX BY CONTRACTOR) circuit breaker
14. Flashing alarm light
15. Set spare fuses
16. White phenolic nameplates with black lettering
17. 600 VAC terminal block
18. U.L. panel label per the application
19. Electrical enclosure shall be NEMA 4X stainless steel.

2.04 COLD WEATHER PROTECTION

- A. The screenings discharge transport tube shall be furnished with a heat tracing system for outdoor weather protection that shall completely enclose the screenings transport tube, compaction and dewatering zone, screenings discharge drop chute and all spray wash piping, and solenoid valves.
- B. The cold weather protection system shall include heat tracing, adjustable thermostat, insulation and a fiberglass protective jacket. Heat tracing shall be suitable for a non-hazardous electrical environment.
- C. The heat tracing system shall be suitable for operation down to a minimum temperature of -25°C (-13°F) and shall be powered from the main control panel.
- D. Weather protection system protective cover shall be molded fiberglass reinforced polyester laminate, with the exterior surface gel coated for ultraviolet radiation protection. Fabricated metallic or plastic covers that are bolted or riveted together or covers made of fabric will not be acceptable for this project. Fiberglass shall have a glass content of not less than 30%, a tensile strength of not less than 22,000 psi, a flexural strength of not less than 25,000 psi and Barcol hardness of not less than 40. Finished fiberglass must withstand a temperature of 200°F without blistering, pinholes, warping or other defects. Gel coat shall be provided with impregnated pigment for exterior light gray color. The weather protection package cover shall be designed to support a wind load of 30 lb per square foot.
- E. The weather protection package fiberglass cover sections shall be split into two sections when mounted axially along the transport tube. Weather protection system fiberglass cover sections shall extend from the discharge chute over the compaction and dewatering zone and down to the main basket support flange gussets. Each split fiberglass cover section shall be connected via fiberglass flanges and no more than six (6) stainless steel thumb screws for ease of operator access. Each fiberglass cover section shall be designed so that the insulation is completely encapsulated within the fiberglass to prevent water

intrusion and damage. Designs utilizing loose fiberglass or foam insulation that are not encapsulated in FRP will not be acceptable for this project. Each fiberglass half section shall be approximately 2 feet long with molded fiberglass flanges. Individual sections shall be connected via fiberglass flanges and a stainless steel V-ring captive clamping system for easy installation and removal.

- F. Where the wash water supply and electrical wiring conduit penetrates the fiberglass cover bulkhead adapters shall be provided.
- G. All fasteners to assemble the fiberglass cover components shall be stainless steel.
- H. A fabricated composite weather enclosure shall be provided for the water strainer specified in paragraph 2.02.D.4. Enclosure shall be provided with a removable cover.
- I. The plant water supply system piping to the screen and the water strainer described in paragraph 2.02.D.4. shall be provided with heat tracing and insulation by the CONTRACTOR. The MANUFACTURER'S control panel shall be provided with sufficient low voltage power to handle up to an additional 250 watts from the CONTRACTOR supplied plant water heat tracing system.

2.05 ANCHOR BOLTS

- A. Equipment manufacturer shall furnish all anchor bolts of ample size and strength required to securely anchor each item of equipment. Bolts, washers and hex nuts shall be 304 stainless steel unless noted otherwise. Anchor bolts shall be drilled-in epoxy-type stainless steel.
- B. Anchor bolts shall be set by the CONTRACTOR. Equipment shall be placed on the foundations, leveled, shimmed, bolted down, and grouted with a non-shrinking grout.

2.06 SPARE PARTS

- A. The following spare parts shall be provided:
 - 1. One (1) brush assembly with stainless steel mounting hardware
 - 2. One (1) complete solenoid valve assembly
 - 3. One (1) solenoid valve re-build kit
 - 4. One (1) set of lower wear strips and mounting hardware
- B. Spare parts shall be individually boxed with the project name and part number clearly identified on each individual box. All spare parts shall be shipped in a separate crate and clearly labeled. Spare parts shall be stored indoors by the Contractor in a temperature-controlled environment.

2.07 SHOP SURFACE PREPARATION AND PAINTING

- A. Electric motors, speed reducers, and other self-contained or enclosed components shall have manufacturer's standard enamel finish.

- B. Clean all stainless steel surfaces and provide glass bead blast and chemically treat with Citrisurf 77 all external non-wetted stainless steel to a uniform finish. No hazardous wastes will be produced during fabrication because Citrisurf 77 is a citric acid based product that is non-toxic. The semi-cylindrical screen manufacturer shall clearly identify the passivation procedure methodology and shall certify that no hazardous wastes were produced.

2.08 SOURCE QUALITY CONTROL

- A. All structural stainless steel components shall be fabricated in the United States and shall conform to the requirements of "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" published by the American Institute of Steel Construction.
- B. All parts and assemblies shall be fabricated from sheets and plates of AISI Type 304 stainless steel with a finish conforming to AISI 304 and ASTM A666, unless noted otherwise. All rolled or extruded shapes shall be fabricated to conform to ASTM A276. All tubular products and fittings shall be fabricated to conform to ASTM A312, A351 and A403.
- C. All welding in the factory shall use shielded arc, inert gas, MIG or TIG method. Add filler wire to all welds to provide for a cross section equal to or greater than the parent metal does. All butt welds shall be full penetration type to the interior surface. Provide gas shielding to interior and exterior of the joint.
- D. Welding of the screen components shall be in accordance with the latest edition of the American Welding Society (AWS) standards. Field welding of stainless steel will not be permitted.
- E. Bolts, nuts and washers shall be AISI 304 stainless steel furnished in accordance with ASTM A193.
- F. All surfaces that are specified to be machined shall be designed and fabricated to provide a runout of not more than 0.005 inches and a concentricity to within 0.005 inches.
- G. Design and fabrication of structural steel members shall be in accordance with AISC and AWS Standards. The manufacturer shall comply with the American Welding Society (AWS) and the American Institute of Steel Construction (AISC) most current listed standards and qualifications in 2004 D1.1, the criteria per the requirements of Section 6 - Inspection - Structural Welding Code. Evidence of such AWS and AISC compliance shall be submitted with shop drawing submittals as follows:
 - 1. AWS Certified Welding Inspectors (minimum 2 on staff) shall conform to all standards, current or previous as listed in section 6.1.4 AWS QC1, Standard and Guide for Qualification and Certification of Welding Inspectors.
 - 2. AWS Non Destructive Testing Inspectors (Level I, II, III) for Magnetic Particle and Ultra-Sonic testing (minimum 2 on staff) shall conform to all standards, current or previous as listed in and in conformance with The American Society for Non-Destructive Testing (ASNT-TC-1A).

PART 3 EXECUTION

3.01 FIELD PREPARATION AND PAINTING

- A. The CONTRACTOR shall touch-up all shipping damage to the paint and stainless steel as soon as the equipment arrives on the job site.
- B. The CONTRACTOR shall supply paint for field touch-up and field painting, as needed.
- C. The CONTRACTOR shall finish paint electrical motors, speed reducers, and other self-contained or enclosed components with oil-resistant enamel.
- D. Prior to assembly the CONTRACTOR shall coat all stainless steel bolts and nut threads with a non-seizing compound.

3.02 INSTALLATION

- A. The manufacturer shall schedule one (1) trip to the project site for equipment start-up assistance as noted in paragraph 3.05.A. for the CONTRACTOR and for operating training as noted in paragraph 3.05.A. for OWNER personnel.
- B. After the CONTRACTOR has installed the screen and the equipment is capable of being operated, the equipment manufacturer shall furnish a qualified representative for a minimum of two (2) days (up to 16 hours) to inspect the equipment and to supervise field-testing and start-up for the CONTRACTOR.
- C. After the equipment has been placed into operation, the manufacturer's representative shall make all final adjustments for proper operation.

3.03 SHOP TESTING

- A. Prior to shipment of the equipment the screen shall be operated for a minimum of four (4) hours at the fabrication location with the specific drive motor that will be furnished for the project at the actual operating angle of the screen for the project.
- B. During the shop test the following parameters shall be recorded:
 - 1. Motor serial number
 - 2. Amperage draw at start-up, after two hours and after four hours during forward operation
 - 3. Amperage draw during reverse operation
- C. A certified shop test report shall be submitted to the ENGINEER.

3.04 FIELD TESTING

- A. Prior to final acceptance of the screen, three (3) tests shall be conducted according to the EPA Paint Filter Test as described in method 9095 of EPA Publication SW-486.
- B. Should the system fail to produce screenings capable of passing the "EPA Paint Filter Test", the manufacturer shall at its own expense make all necessary modifications to the equipment until such tests can be passed.

3.05 OPERATOR TRAINING

- A. Provide operator training for OWNER'S personnel after system is operational. Training will take place while manufacturer's representative is at the job site for inspection.
- B. Within twelve (12) months after start-up the manufacturer shall provide one (1) trip and one (1) day (up to 8 hours) of follow-up service and operator training. This shall be exclusive of the start-up service work that is specified in paragraph 3.02. and 3.05.A.

END OF SECTION

GENERAL NOTES:

1. LOCATION OF LOT LINES, PROPERTY LINES, RIGHT-OF-WAY LINES, AND OTHER LAND DIVISION REFERENCES WERE OBTAINED FROM RECORDED DATA AND LAND USE OBSERVATIONS. THE LAND DIVISIONS WERE NOT FIELD CHECKED. THEREFORE, THEY MUST ONLY BE CONSIDERED TO APPROXIMATELY REPRESENT THE ACTUAL LAND DIVISIONS, PROPERTY AND/OR EASEMENTS.
2. ALL CONSTRUCTION STAKING SHALL BE BY THE CONTRACTOR AT HIS EXPENSE.
3. THE CONTRACTOR SHALL RESTORE OR HAVE RESTORED, AT HIS EXPENSE, ALL EXISTING FACILITIES WHICH HAVE BEEN DAMAGED DUE TO HIS CONSTRUCTION UTILIZE THE SAME MATERIAL COMPOSITION AS EXISTING TO REPLACE THE EXISTING FACILITIES UNLESS APPROVED OTHERWISE BY THE OWNER.
4. BARROW COUNTY STANDARDS AND SPECIFICATIONS.
5. DURING CONSTRUCTION THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY TRAFFIC CONTROL MEASURES TO ENSURE SAFETY AT ALL TIMES FOR EMPLOYEES, RESIDENTS, AND MOTORISTS, IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, ANSI D6.1, LATEST REVISION.
6. ALL EARTHWORK OPERATIONS SHALL COMPLY WITH THE REQUIREMENTS OF OSHA 29 CFR PART 1926, SUBPART P-EXCAVATIONS, LATEST REVISION, AND SHALL BE CONDUCTED IN A MANNER ACCEPTABLE TO OWNER.
7. ALL FORCE MAIN PIPE WITH LESS THAN 36 INCHES OF FINAL COVER SHALL BE DUCTILE IRON PIPE, BEDDING FOR ALL PIPING SHALL BE CLASS "D" EXCEPT WHEN WET TRENCH CONDITIONS WARRANT "B" OR "C" BEDDING.
8. HORIZONTAL PIPE BENDS/FITTINGS NOTED ON PLANS ARE TO ASSIST THE CONTRACTOR WITH THE HORIZONTAL ALIGNMENT OF THE PIPELINE(S) AND IS NOT INTENDED TO DEPICT ALL NECESSARY HORIZONTAL BENDS/FITTINGS TO CONSTRUCT THE PIPELINE(S).
9. STRUCTURES, TREES, SHRUBS, AND OTHER PLANT MATERIAL THAT FALL WITHIN THE PROJECT LIMITS, BUT OUTSIDE THE LIMITS OF CONSTRUCTION SHALL NOT BE DISTURBED, UNLESS OTHERWISE NOTED.
10. THE CONTRACTOR SHALL ENSURE THAT POSITIVE AND ADEQUATE DRAINAGE IS MAINTAINED AT ALL TIMES WITHIN THE PROJECT LIMITS.

ABBREVIATIONS:

AR.V.	==	AIR RELEASE VALVE
B.M.	==	BENCHMARK
C.F.	==	CUBIC FEET
C.M.P.	==	CORRUGATED METAL PIPE
C.O.	==	CLEANOUT
C.Y.	==	CUBIC YARD
D.E.	==	DRAINAGE EASEMENT
D.I.P.	==	DROP INLET
D.I.P.	==	DUCTILE IRON PIPE
E.P.	==	EASEMENT
E.O.P.	==	EDGE OF PAVEMENT
ER.	==	EDGE OF ROAD
F.E.S.	==	FINISHED FLOOR ELEVATION
F.H.	==	FIRE HYDRANT
G.D.O.T.	==	GEORGIA DEPT. OF TRANSPORTATION
G.M.D.	==	GAS VALVE
G.W.	==	GUY WIRE
HDWL.	==	HEADWALL
I.E.	==	INVERT ELEVATION
I.P.F.	==	IRON PIN FOUND
J.B.	==	JUNCTION BOX
J.F.	==	JUNCTION FOOT
M.H.	==	MANHOLE
M.A.	==	MANHOLE ACCESSIBLE NOW OR FORMERLY
N.A.	==	NOT APPLICABLE
PERM.	==	PERMANENT
P.P.	==	PROPERTY LINE
P.V.C.	==	POLYVINYLCHLORIDE PIPE
R.C.P.	==	REINFORCED CONCRETE PIPE
R/W	==	RIGHT OF WAY
S.S.E.	==	SEWER EASEMENT
S.T.A.	==	STATIONARY BENCHMARK
T.B.M.	==	TEMPORARY BENCHMARK
T.C.E.	==	TEMPORARY CONSTRUCTION EASEMENT
V.C.P.	==	VITRIFIED CLAY PIPE
W.L.	==	WATER LINE
W.M.	==	WATER METER
W.V.	==	WATER VALVE



24 HR CONTACT
MARK WHIDDON
WASTEWATER DIRECTOR
 PH: (770) 307-1586

OWNER
BARROW COUNTY WASTEWATER
 625 SR 211, NE
 WINDER, GA 30680
 PH: (770) 307-3014

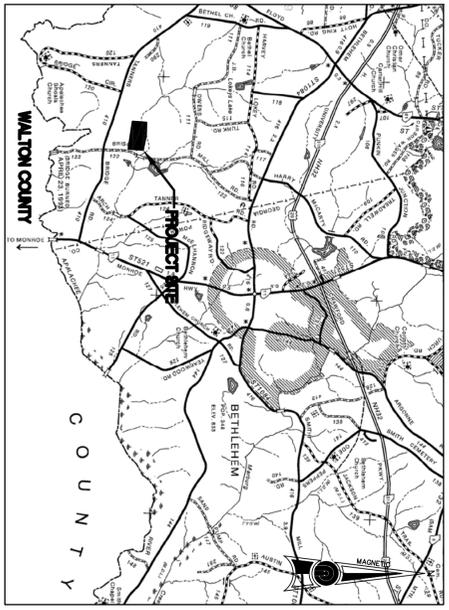
ALL CONSTRUCTION METHODS, PROCEDURES AND MATERIALS SHALL CONFORM TO THE BARROW COUNTY WATER AND SEWERAGE AUTHORITY CONSTRUCTION STANDARDS AND SPECIFICATIONS.

OBSTRUCTIONS ENCOUNTERED:

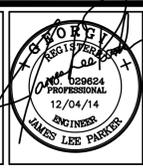
IN ADDITION TO SHOWING THE STRUCTURES TO BE BUILT FOR THIS PROJECT, THE DRAWINGS SHOW CERTAIN INFORMATION OBTAINED BY THE ENGINEER REGARDING THE PIPES, POLE LINES, CONDUITS AND OTHER STRUCTURES WHICH EXIST ALONG THE LINE OF THE WORK, BOTH AT AND BELOW THE SURFACE OF THE GROUND. THE ENGINEER AND THE OWNER EXPRESSLY DISCLAIM ANY RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION GIVEN ON THE DRAWINGS WITH REGARD TO EXISTING STRUCTURES, AND THE CONTRACTOR WILL NOT BE ENTITLED TO ANY EXTRA COMPENSATION ON ACCOUNT OF INACCURACY OR INCOMPLETENESS OF SUCH INFORMATION, SAID STRUCTURES BEING INDICATED ONLY FOR THE CONVENIENCE OF THE CONTRACTOR, WHO MUST VERIFY THE INFORMATION TO HIS OWN SATISFACTION. THE GIVING OF THIS INFORMATION UPON THE CONTRACT TO SUPPORT AND PROTECT ALL PIPES, CONDUITS, AND OTHER STRUCTURES WHICH MAY BE ENCOUNTERED DURING THE CONSTRUCTION OF WORK, AND TO MAKE GOOD ALL DAMAGES DONE TO SUCH PIPES, CONDUITS, AND OTHER STRUCTURES, AS PROVIDED IN THESE SPECIFICATIONS. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND OBSTRUCTIONS PRIOR TO EXCAVATION SO AS TO PREVENT DAMAGE TO THOSE SERVICES OR OTHER UTILITIES. ANY SUCH DAMAGES MUST BE REPAIRED WITHOUT DELAY AND THE COST OF SUCH REPAIRS SHALL BE PAID FOR BY THE CONTRACTOR.

LEGEND

EXISTING	NEW
WATER	WATER
SS	SS
SAINTARY SEWER	SAINTARY SEWER
FM	FM
FORCE MAIN	FORCE MAIN
G	G
GAS LINE	GAS LINE
P	P
OVERHEAD POWER LINE	OVERHEAD POWER LINE
UT	UT
UNDERGROUND TELEPHONE LINE	UNDERGROUND TELEPHONE LINE
STORM DRAIN	STORM DRAIN
N.A.	N.A.
RIGHT-OF-WAY	RIGHT-OF-WAY
EDGE OF PAVEMENT	EDGE OF PAVEMENT
PERMANENT EASEMENT	PERMANENT EASEMENT
TEMPORARY CONSTRUCTION EASEMENT	TEMPORARY CONSTRUCTION EASEMENT
N.A.	N.A.
PROPERTY LINE	PROPERTY LINE
CREEK CENTERLINE	CREEK CENTERLINE
DITCH CENTERLINE	DITCH CENTERLINE
ROAD CENTERLINE	ROAD CENTERLINE
POWER POLE	POWER POLE
N.A.	N.A.
MANHOLE	MANHOLE
WATER VALVE	WATER VALVE
FIRE HYDRANT	FIRE HYDRANT
N.A.	N.A.
GUARDRAIL	GUARDRAIL
WATER METER	WATER METER
N.A.	N.A.
TELEPHONE PEDESTAL	TELEPHONE PEDESTAL
AIR RELEASE VALVE	AIR RELEASE VALVE
SIGN	SIGN
BUILDING	BUILDING
FENCE	FENCE
TREE LINE	TREE LINE
N.A.	N.A.
CONTROL POINT	CONTROL POINT
SOIL BORING W/BORING NO	SOIL BORING W/BORING NO
CONCRETE PAVING	CONCRETE PAVING
GRAVEL ROAD	GRAVEL ROAD
N.A.	N.A.
LIGHT POLE	LIGHT POLE
MONITORING WELL	MONITORING WELL
SURFACE FLOW	SURFACE FLOW
CONTOUR	CONTOUR
SPOT ELEVATION	SPOT ELEVATION
RIP RAP	RIP RAP
WETLANDS	WETLANDS
N.A.	N.A.
100-YR FLOOD LIMITS	100-YR FLOOD LIMITS



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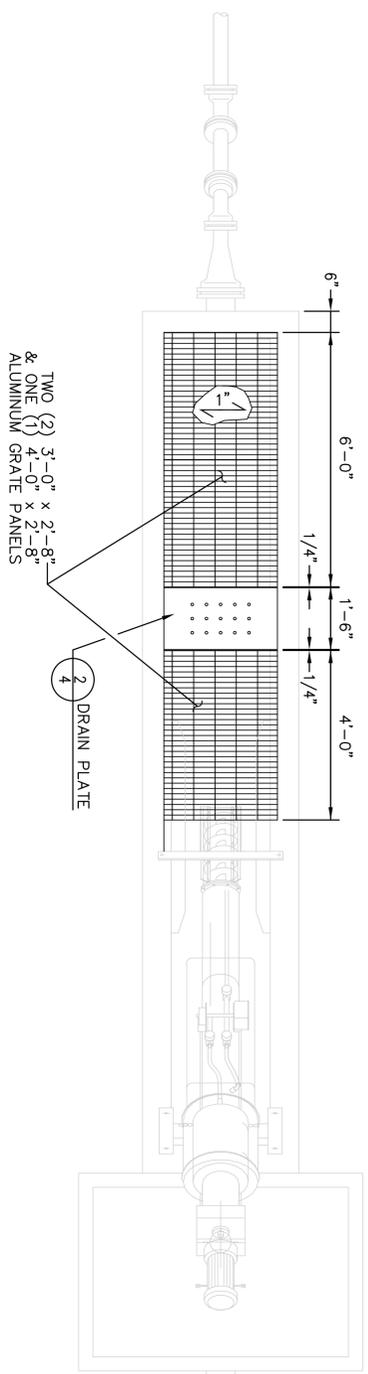
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 Planners, Engineers, Architects & Surveyors
 802 E. SPRING STREET
 MONROE, GEORGIA 30655
 (770) 267-8800 (FAX) (770) 207-1564

TANNERS BRIDGE ROAD
LAND APPLICATION
SYSTEM MECHANICAL
SCREENING FACILITIES

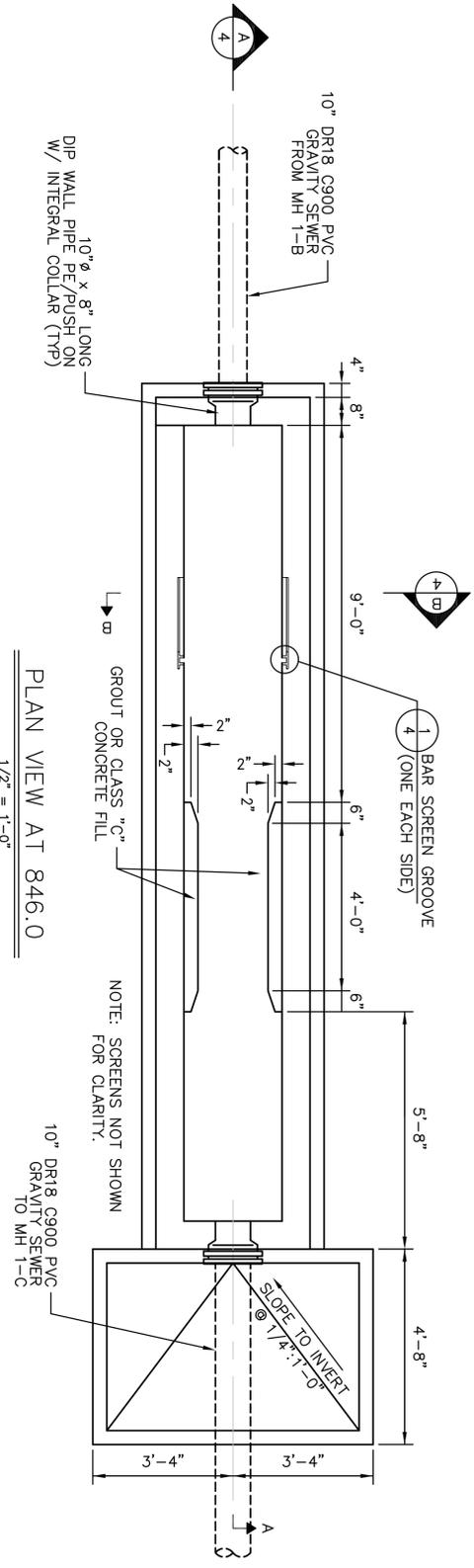
GENERAL NOTES AND LEGEND
SHEET TITLE
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DATE	NO	BY	DESCRIPTION
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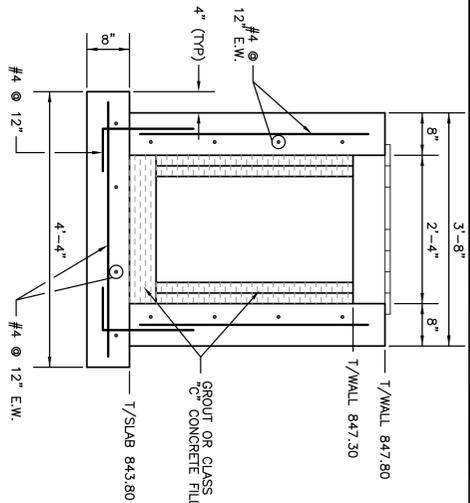
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E13-240
 JOB NUMBER
2
 FILE NUMBER



GRATING PLAN
1/2" = 1'-0"

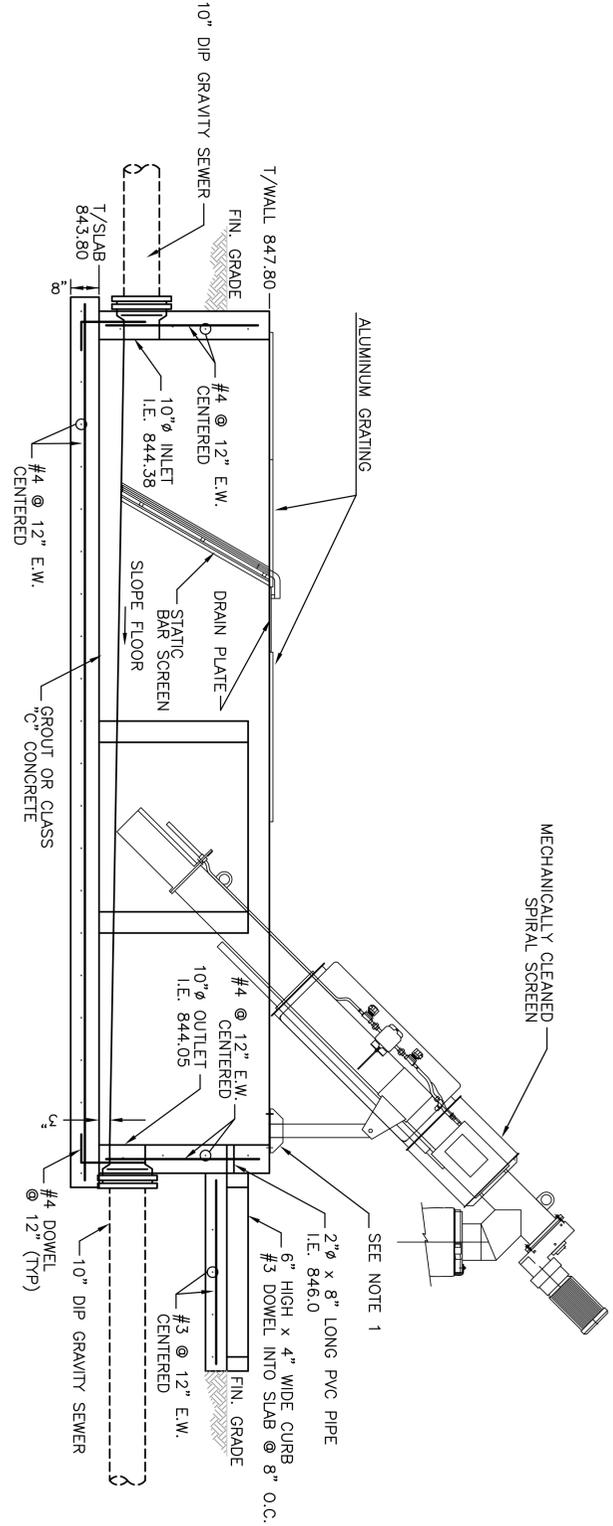


PLAN VIEW AT 846.0
1/2" = 1'-0"

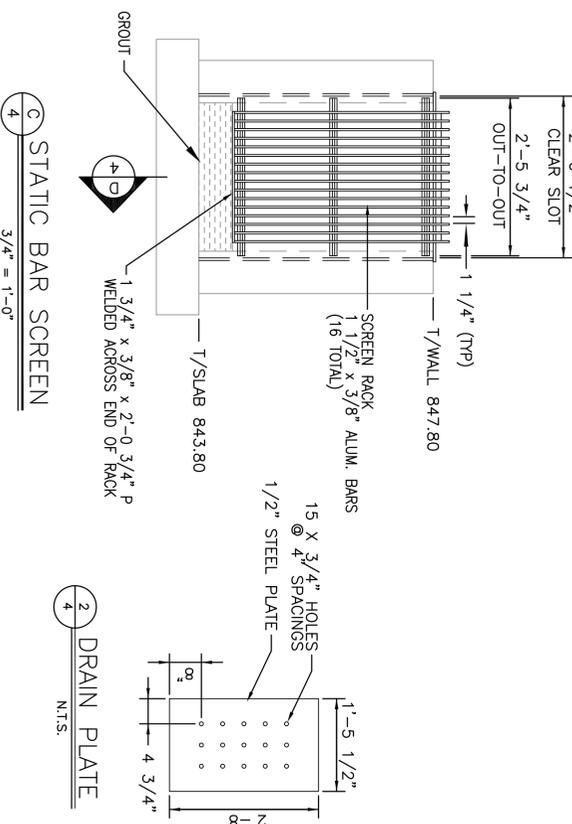


SECTION B
3/4" = 1'-0"

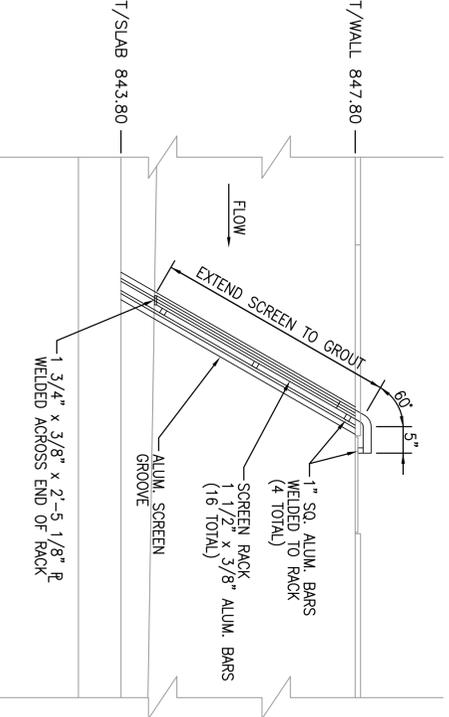
- NOTES:
1. MECHANICAL SCREEN SUPPORT INSTALLED PER SCREEN MANUFACTURER RECOMMENDATION.
 2. FURNISH ONE (1) 8-FOOT LONG ALUMINUM RAKE FOR USE WITH STATIC BAR SCREEN.
 3. SET GROUT SHALL BE AS MANUFACTURED BY MASTER BUILDER TECHNOLOGIES OR APPROVED EQUAL.



SECTION A
1/2" = 1'-0"



SECTION C
3/4" = 1'-0"



SECTION D
3/4" = 1'-0"

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PPI JOB NUMBER E13-240			
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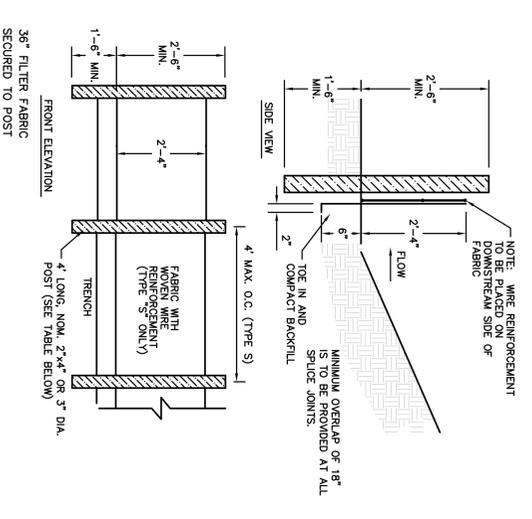
HEADWORKS STRUCTURE		
DESIGN BY	DRAWN BY	CHECKED BY
JDS	BBH	JDS

**TANNERS BRIDGE ROAD
LAND APPLICATION
SYSTEM MECHANICAL
SCREENING FACILITIES**

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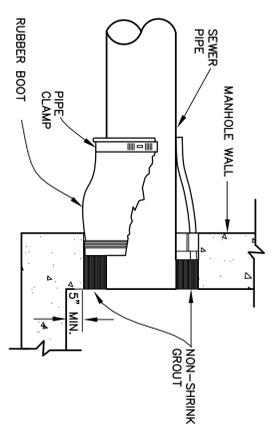
122624
12/04/14
ENGINEER
JAMES LEE PARKER



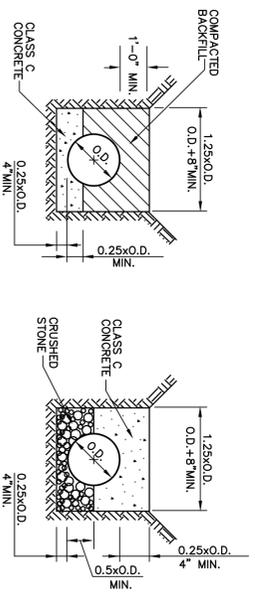
Sd1-S

SILT FENCE TYPE	POST MAT'L	REINFORCEMENT
S	STEEL	WOVEN WIRE BEHIND FABRIC

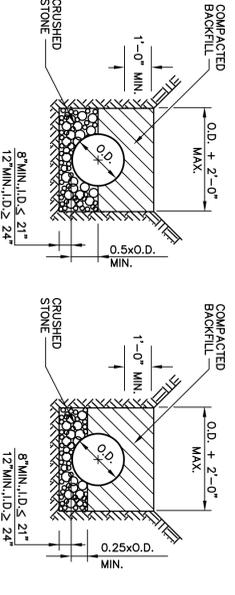
SILT FENCE
N.T.S. **EC20**



RUBBER BOOT
N.T.S. **S14**



CONCRETE ARCH.



CONCRETE GRADE

CLASS "A"
N.T.S. **S08**

CLASS "B"
N.T.S. **S08**

CLASS "C"
N.T.S. **S08**

BEDDING DETAIL
N.T.S. **S08**

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REGISTERED PROFESSIONAL ENGINEER
12/04/14
WANDA LEE PARRER

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**TANNERS BRIDGE ROAD
LAND APPLICATION
SYSTEM MECHANICAL
SCREENING FACILITIES**

**CONSTRUCTION AND
EROSION CONTROL
DETAILS**

DESIGN BY **JDS** DRAWN BY **BBH** CHECKED BY **JDS**

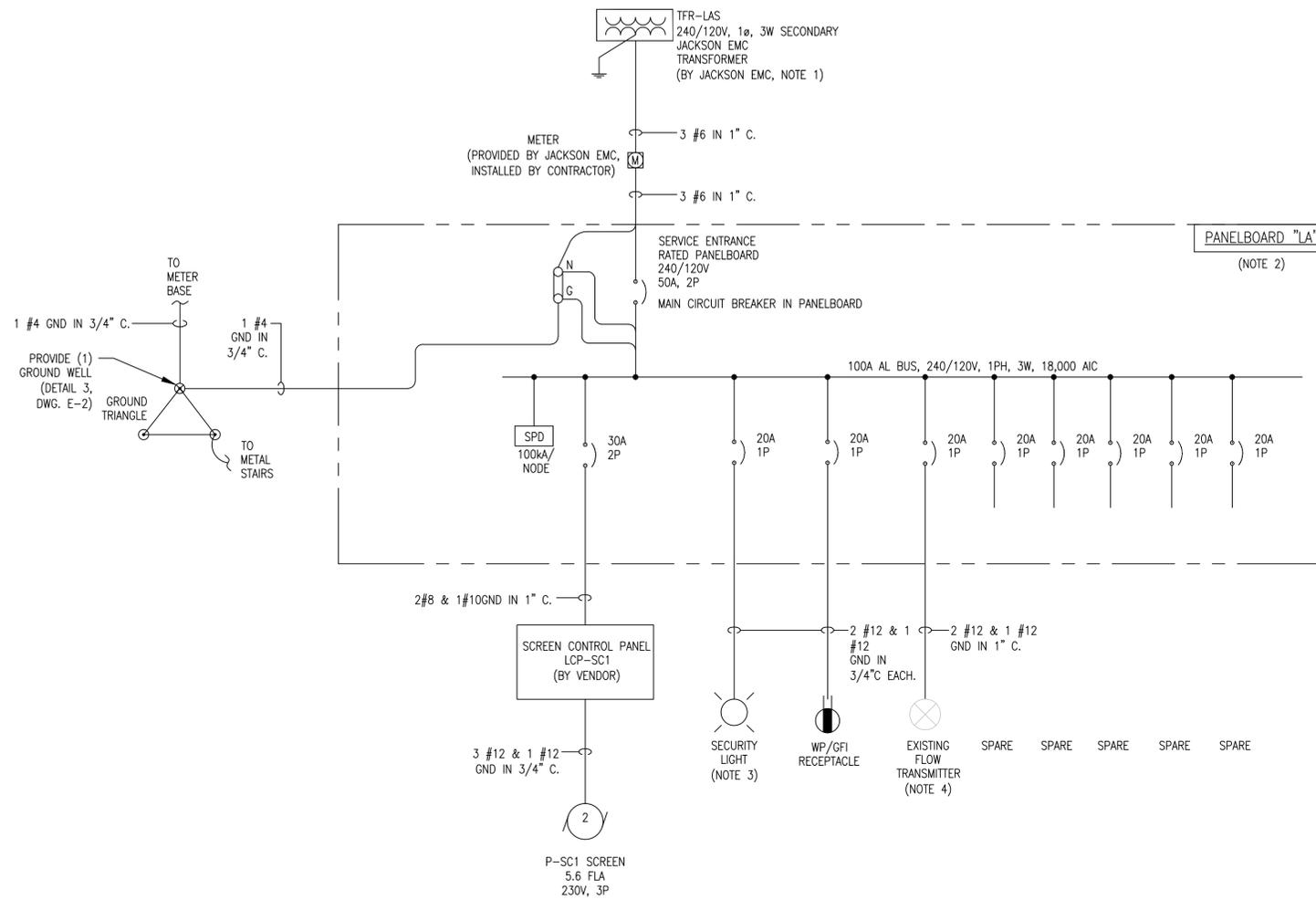
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PPI JOB NUMBER **E13-240**

PLOT DATE: 12/5/2014 9:33 AM

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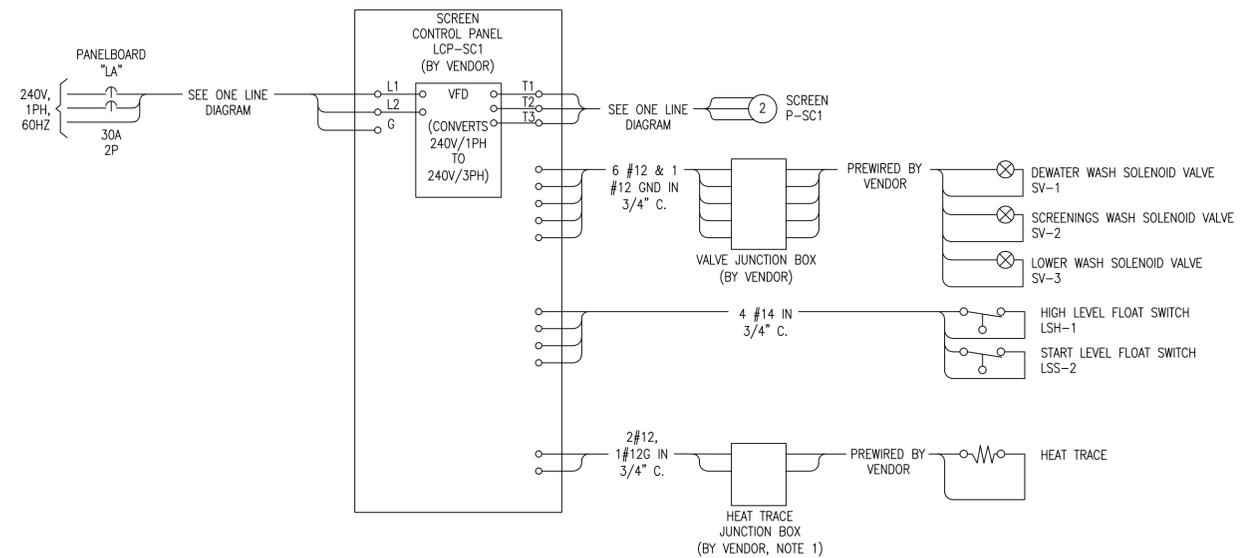
1 TANNERS BRIDGE ROAD LAS ONE LINE DIAGRAM

ONE LINE DIAGRAM NOTES:

- THE CONTRACTOR SHALL COORDINATE THE LOCATION OF THE 240/120V TRANSFORMER WITH JACKSON EMC. THE OWNER IS RESPONSIBLE FOR PAYING ALL COSTS ASSOCIATED WITH BRINGING THE 240/120V, 1 PHASE SERVICE TO THE SITE. CONTACT BILL BRINKMAN @ 706-367-6286 EMAIL: PBRINKMAN@JACKSONEMC.COM FOR COORDINATION.
- PANELBOARD "LA" SHALL BE 50A, 240/120V, 1PH, 3W SERVICE ENTRANCE RATED NEMA 3R ENCLOSURE, 12 CIRCUITS AS SHOWN ON ONE LINE DIAGRAM, ALUMINUM BUS AND 100KA RATED INTEGRAL SURGE PROTECTION DEVICE.
- THE CONTRACTOR SHALL PROVIDE SECURITY LIGHT FOR SERVICE OF EQUIPMENT. SEE DETAIL 4, DWG E-2 FOR LOCATION AND DETAILS OF POLE AND LIGHT.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING 120V POWER TO THE EXISTING FLOWMETER AND ALL OTHER EXISTING LOADS AT THE FLOWMETER LOCATION FED FROM THE EXISTING POWER DROP. COORDINATE REMOVAL OF THE EXISTING POWER METER WITH JACKSON EMC.

GENERAL NOTES:

- SCOPE:
 - FURNISH ALL LABOR, MATERIAL, EQUIPMENT AND TOOLS REQUIRED TO COMPLETE INSTALLATION OF THE ELECTRICAL SYSTEM INCLUDING BUT NOT LIMITED TO WIRING, BOXES, LIGHT FIXTURES, PANELS, SWITCHES, RECEPTACLES, DISCONNECTS, STARTERS, AND ALL OTHER WORK INDICATED ON THE DRAWINGS OR AS SPECIFIED HEREIN.
 - OBTAIN ALL PERMITS, INSPECTIONS, AND APPROVALS AS REQUIRED BY THE LOCAL AUTHORITIES HAVING JURISDICTION AND DELIVER CERTIFICATE OF APPROVAL TO THE GENERAL CONTRACTOR. ALL ASSOCIATED FEES SHALL BE PAID BY THE CONTRACTOR.
 - ALL MATERIALS AND EQUIPMENT OF THE ELECTRICAL SYSTEM NECESSARY FOR ITS PROPER OPERATION, BUT NOT SPECIFICALLY MENTIONED OR SHOWN ON THE DRAWINGS, SHALL BE FURNISHED AND INSTALLED WITHOUT ADDITIONAL CHARGE.
 - WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE 2011 NATIONAL ELECTRICAL CODE, THE LATEST STANDARD BUILDING CODE, NFPA 820, AND LOCAL AUTHORITIES HAVING JURISDICTION.
- ALL SUBSTITUTIONS FOR EQUIPMENT AND MATERIAL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION.
- THE CONTRACTOR SHALL COORDINATE ALL WORK WITH ALL OTHER TRADES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACTUAL LOCATION OF EQUIPMENT, DUCTWORK, PIPING, ETC. AND COORDINATED THE INSTALLATION ACCORDINGLY.
- ALL CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM CONDUCTOR SIZE FOR POWER AND LIGHTING WIRING. USE #14 AWG MINIMUM CONDUCTOR FOR SIGNAL WIRING. THE INSULATION FOR ALL CONDUCTORS SHALL BE THWN-2. SERVICE ENTRANCE CONDUCTORS SHALL BE XHHW.
- POWER WIRES SIZES #12 AWG AND #10 AWG SHALL BE SOLID TYPE. ALL OTHER SIZES SHALL BE STRANDED.
- ALL EXPOSED CONDUIT SHALL BE PVC COATED RIGID GALVANIZED STEEL, MINIMUM OF 3/4". ALL BURIED CONDUIT SHALL BE PVC-40, MINIMUM OF 1". ALL UNDERGROUND CONDUITS SHALL HAVE RIGID ELBOWS.
- ALL FITTINGS SHALL BE CAST WITH THREADED HUBS. ALL CONNECTIONS SHALL BE COMPRESSION TYPE.



2 SCREEN CONTROL PANEL SCHEMATIC

NOTES:

- CONTRACTOR SHALL VERIFY ALL EXPOSED PIPING/CONNECTIONS WITH VENDOR AND PLAN DRAWINGS TO CONFIRM WHERE HEAT TRACE IS REQUIRED.
- CONTRACTOR SHALL VERIFY AND PROVIDE THE REQUIRED NUMBER OF CABLES AND CONDUITS AS PER VENDOR SHOP DRAWINGS.
- THE CONTRACTOR SHALL FURNISH AND INSTALL THE SCREEN CONTROL PANEL IN NEMA 4X ENCLOSURE WITH ALL NECESSARY CONTROLS INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:
 - SELECTOR SWITCHES, PUSH BUTTONS AND INDICATOR LIGHTS.
 - ELAPSED TIME METER
 - STRIP HEATER, FAN & THERMOSTAT
 - ONE - VARIABLE SPEED DRIVE, 240V, 1PH INPUT AND 240V, 3PH OUTPUT RATED FOR 2 HP MOTOR
 - AUXILIARY DRY CONTACTS (250VAC, 5 AMP RATED) FOR CONNECTION TO FUTURE SCADA:
 - HIGH LEVEL
 - SCREEN RUNNING
 - SCREEN FAULT.



EDEC, INC.
3069 PEACHTREE IND. BLVD.
SUITE 110
DULUTH, GEORGIA 30097
TEL: (770) 493-8685

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TANNERS BRIDGE ROAD
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SYSTEM MECHANICAL
SCREENING FACILITIES

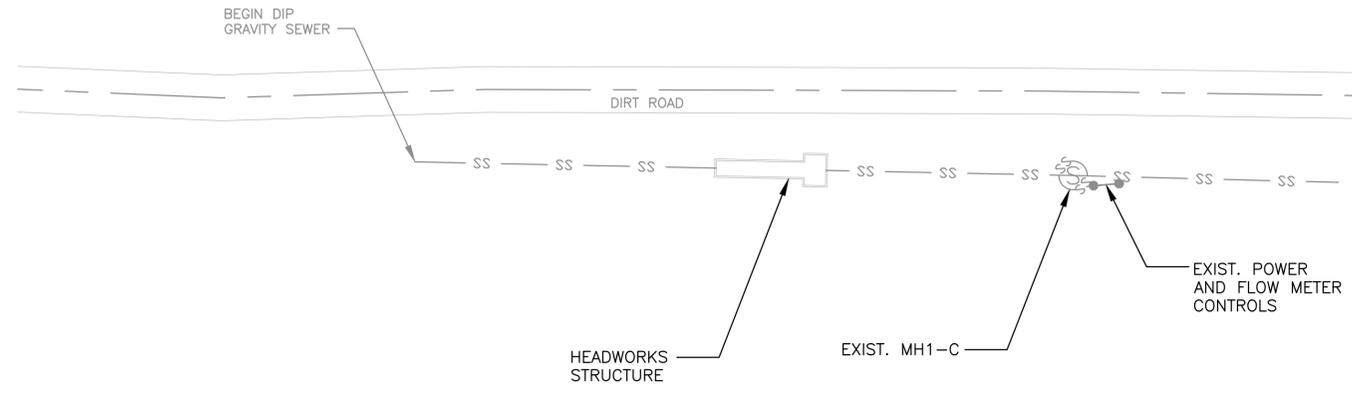
ELECTRICAL ONE LINE
DIAGRAM AND
SCHEMATIC

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DRAWN BY: RV
CHECKED BY: AZ

DATE	NO.	BY	REVISION DESCRIPTION
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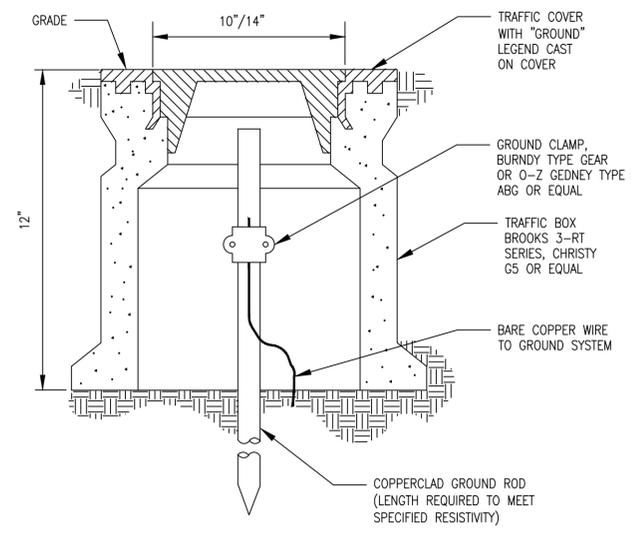
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E13-240
E-1

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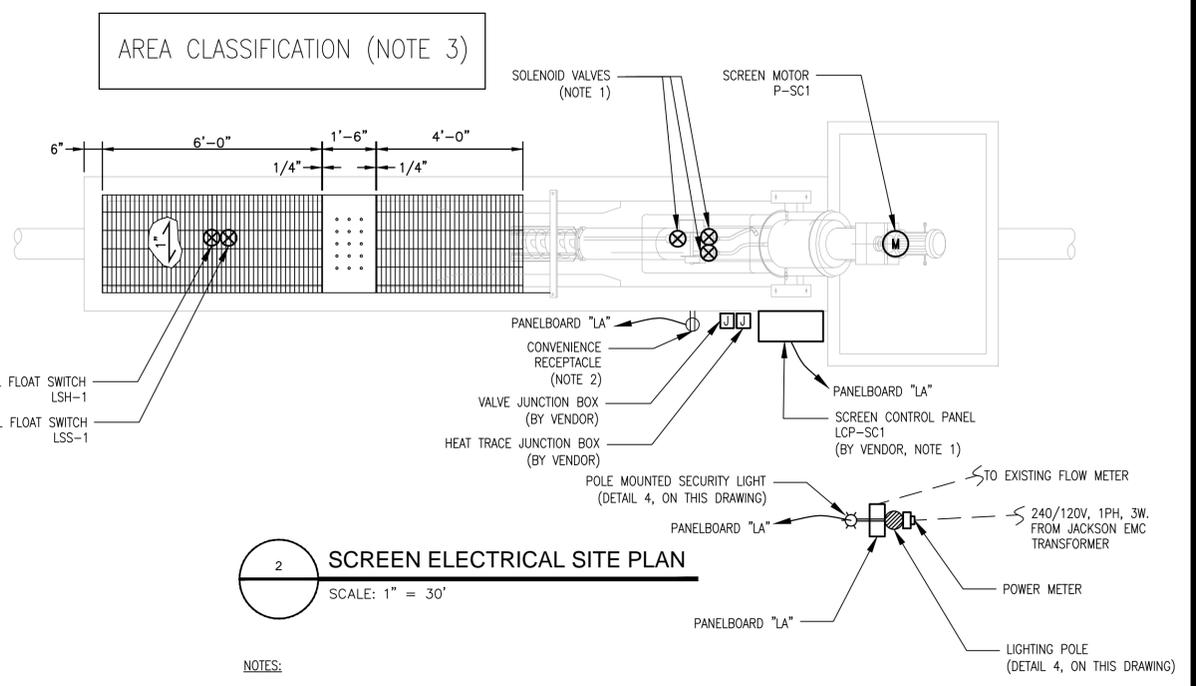


1 TANNERS BRIDGE ROAD LAS ELECTRICAL SITE PLAN
SCALE: 1" = 20'

NOTES:
1. CONTRACTOR SHALL CONFIRM SCREEN PANEL AND ASSOCIATED INSTRUMENTS LOCATIONS WITH VENDOR SHOP DRAWINGS.

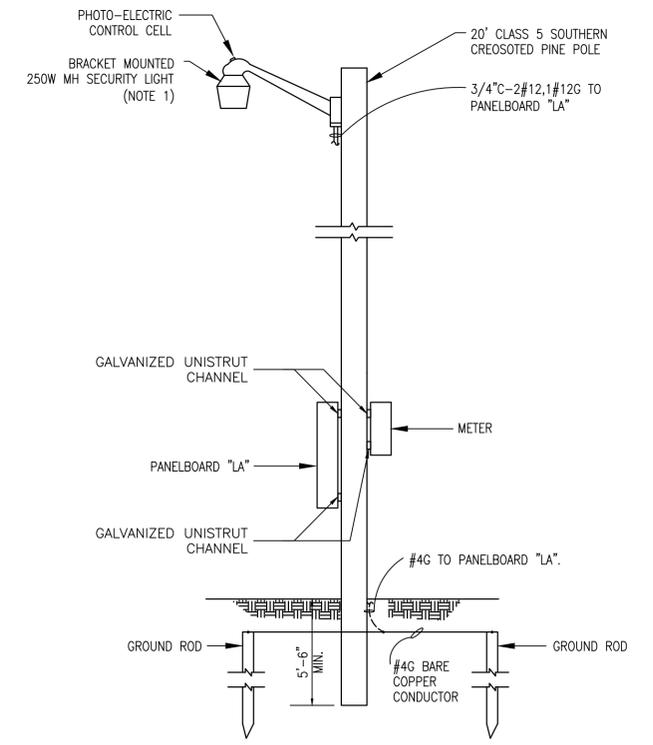


3 GROUND WELL INSTALLATION DETAIL
SCALE: N.T.S.



2 SCREEN ELECTRICAL SITE PLAN
SCALE: 1" = 30'

NOTES:
1. CONTRACTOR SHALL VERIFY EXACT EQUIPMENT LOCATIONS WITH VENDOR SHOP DRAWINGS.
2. CONTRACTOR SHALL FURNISH AND INSTALL A 120VAC/20A/1P CONVENIENCE GFCI RECEPTACLE IN A WEATHERPROOF ENCLOSURE.
3. ALL ELECTRICAL EQUIPMENT ENCLOSURE LOCATED WITHIN 10 FT ENVELOPE AROUND SCREEN AND OPEN CHANNEL SHALL BE RATED FOR CLASS I, GROUP D, DIVISION 2 AS PER NFPA 820 TABLE 5.2.



4 POWER POLE DETAIL WITH SECURITY LIGHT
SCALE: N.T.S.

NOTES:
1. SECURITY LIGHT MUST BE MOUNTED ON CLASS 5 POLE. THE SECURITY LIGHT ATTACHED TO THE TOP OF THE POLE SHALL BE A GENERAL ELECTRIC MODEL M-250R2-25C1 OR ALTERNATE ACCEPTABLE TO THE AUTHORITY.



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Planners, Engineers, Architects & Surveyors
802 EAST SPRING STREET
MONROE, GEORGIA 30666 (FAX) (770) 207-1564
(770) 287-8800

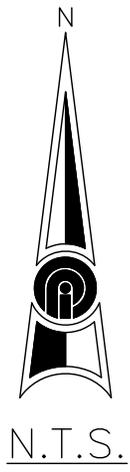
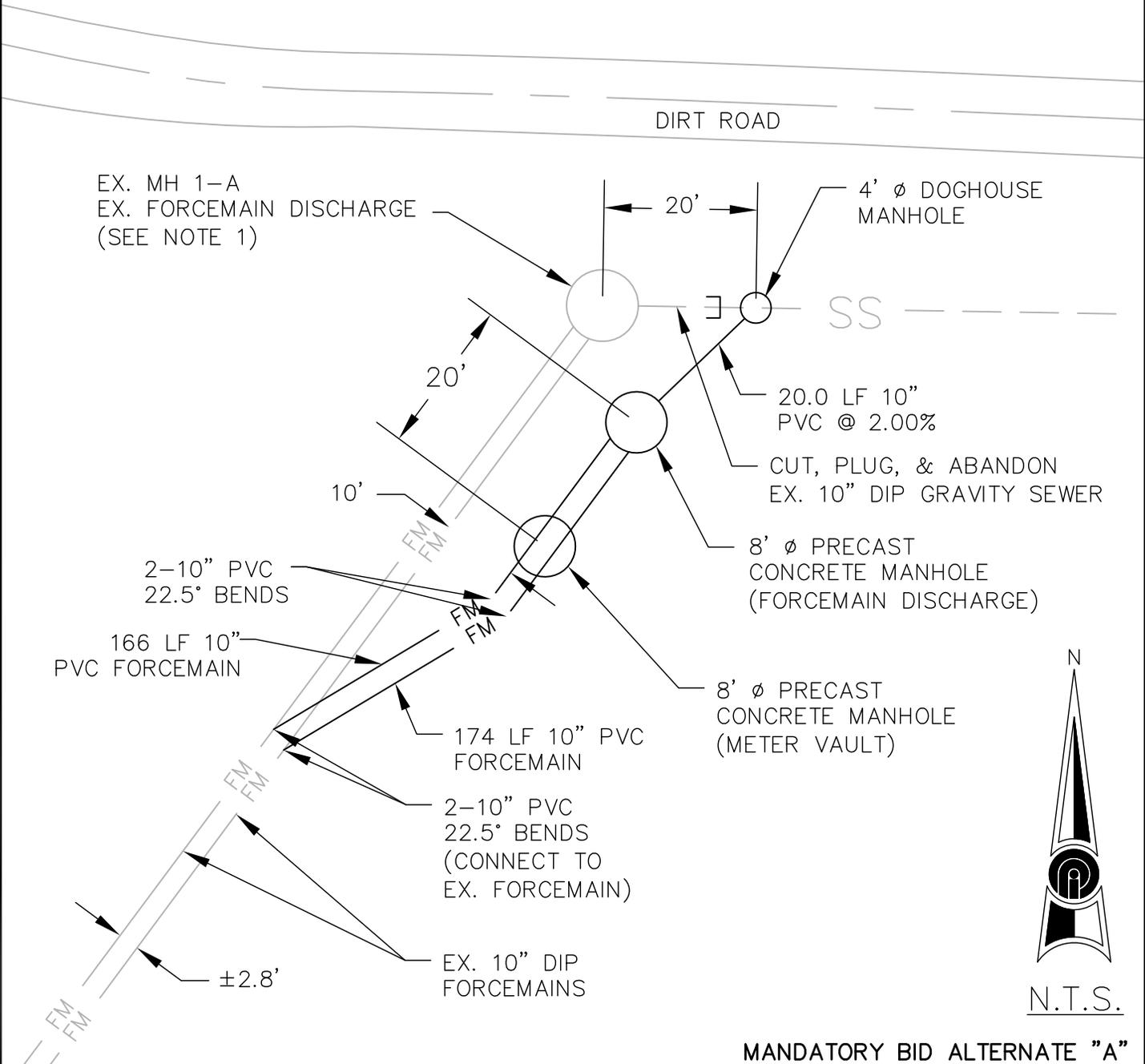
TANNERS BRIDGE ROAD
LAND APPLICATION
SYSTEM MECHANICAL
SCREENING FACILITIES

ELECTRICAL SITE PLAN	DESIGN BY	RV	CHECKED BY	AZ
	DRAWN BY	RV		

DATE	NO.	BY	REVISION DESCRIPTION
12-17-14	A	RV	ISSUED FOR BIDS
PPI JOB NUMBER E13-240			
E-2			
PLOT DATE: 12/4/2014 10:39 AM			

NOTES:

1. EXISTING MANHOLE TO BE ABANDONED SHALL HAVE TOP REMOVED AND DISPOSED OF OFF SITE, FILLED WITH CRUSHED STONE, AND ALL CONCRETE REMOVED WITHIN 2' OF EXISTING GRADE.
2. PERMANENT GRASSING SHALL BE ESTABLISHED OVER ALL DISTURBED AREAS PER MANUAL FOR EROSION & SEDIMENT CONTROL IN GEORGIA.
3. CONTRACTOR TO VERIFY LOCATIONS AND DEPTHS OF EXISTING FORCE MAIN AND GRAVITY SEWERS PRIOR TO INSTALLATION OF PIPE AND STRUCTURES.
4. CONTRACTOR MUST INSTALL THE PROPOSED UTILITIES IN ACCORDANCE WITH BARROW COUNTY STANDARDS AND SPECIFICATIONS.
5. ALL FORCE MAIN AND GRAVITY SEWER PIPING SHALL BE DR18 C900 PVC.

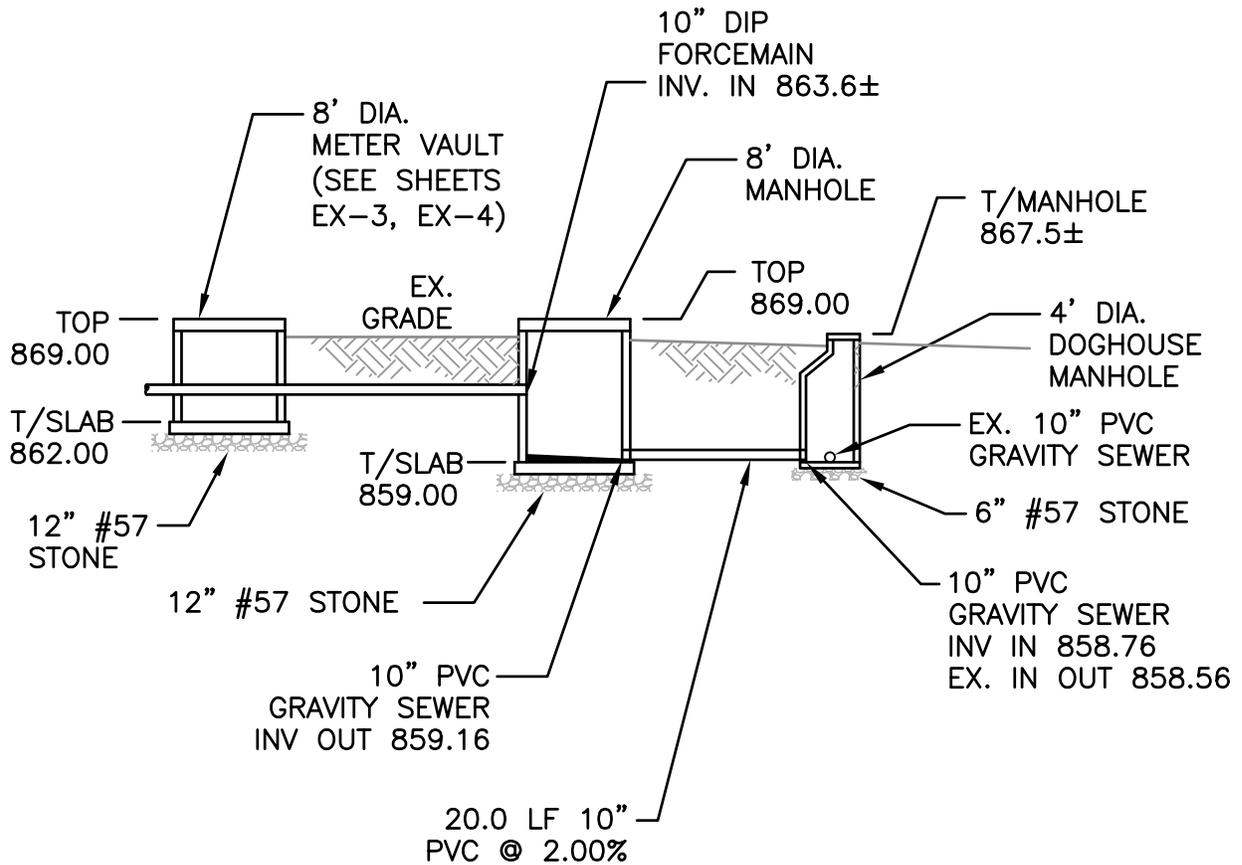


MANDATORY BID ALTERNATE "A"

 <p>Precision Planning, Inc. planners, engineers, architects & surveyors</p>	 <p>BARROW COUNTY COMMISSIONERS GEORGIA CHOOSE BARROW</p>	EX-1	FORCE MAIN AND FLOW METER INSTALLATION
		<p>TANNER'S BRIDGE ROAD LAND APPLICATION SYSTEM MECHANICAL SCREENING FACILITIES PROJECT #SS016</p>	

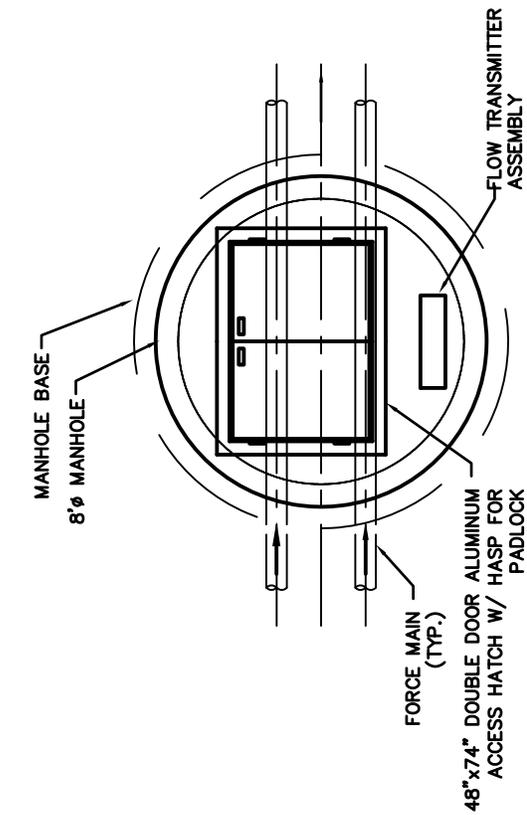
NOTES:

1. SEE SHEET EX-2.1 FOR METER VAULT & DISCHARGE MANHOLE DETAILS.



MANDATORY BID ALTERNATE "A"

 <p>Precision Planning, Inc. planners, engineers, architects & surveyors</p>	 <p>BARROW COUNTY BOARD OF COMMISSIONERS GEORGIA CHOOSE BARROW</p>	EX-2	FORCE MAIN AND FLOW METER SECTION
		<p>TANNER'S BRIDGE ROAD LAND APPLICATION SYSTEM MECHANICAL SCREENING FACILITIES PROJECT #SS016</p>	

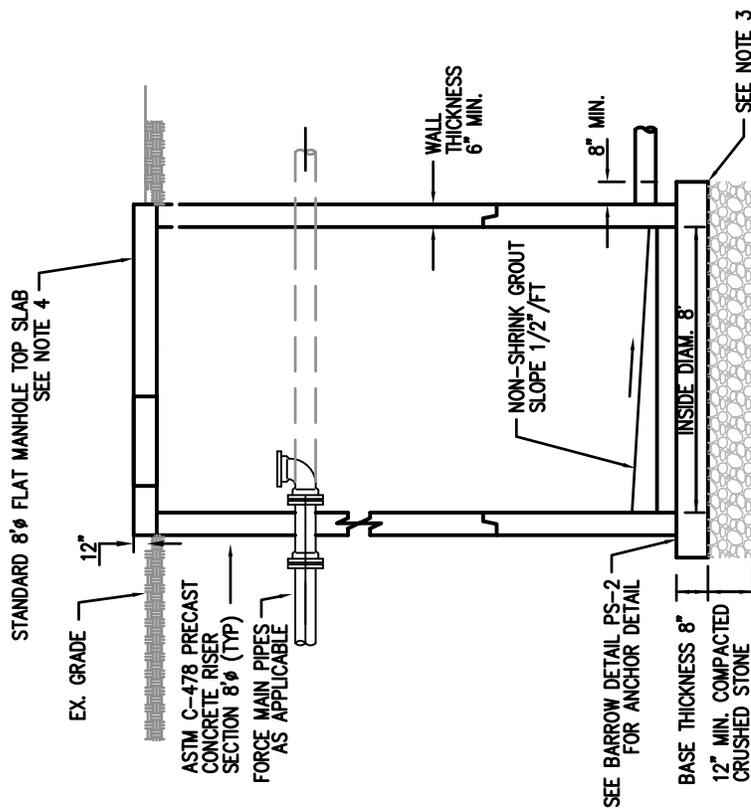


METER VAULT PLAN D02

N.T.S.

NOTES

1. SEE BARROW COUNTY STANDARDS FOR ADDITIONAL DETAILS.
2. MANHOLE TO BE COATED WITH A PROTECTIVE, HIGH BUILD, EPOXY COATING DESIGNED FOR CORROSION PREVENTION IN SEWER STRUCTURES.
3. MANHOLE SHALL BE CAST IN PLACE CONCRETE OR PRECAST CONCRETE IN ACCORDANCE WITH ASTM C478. CAST IN PLACE CONCRETE SHALL INCLUDE APPROPRIATE REINFORCEMENT AS DESIGNED BY STRUCTURAL ENGINEER REGISTERED IN STATE OF GEORGIA.
4. DISCHARGE MANHOLE SHALL HAVE STANDARD FRAME AND COVER, AND METER VAULT TOP SLAB SHALL HAVE ACCESS HATCHES AS SHOWN IN DETAIL D02.



8' DIA. MANHOLE D01

N.T.S.

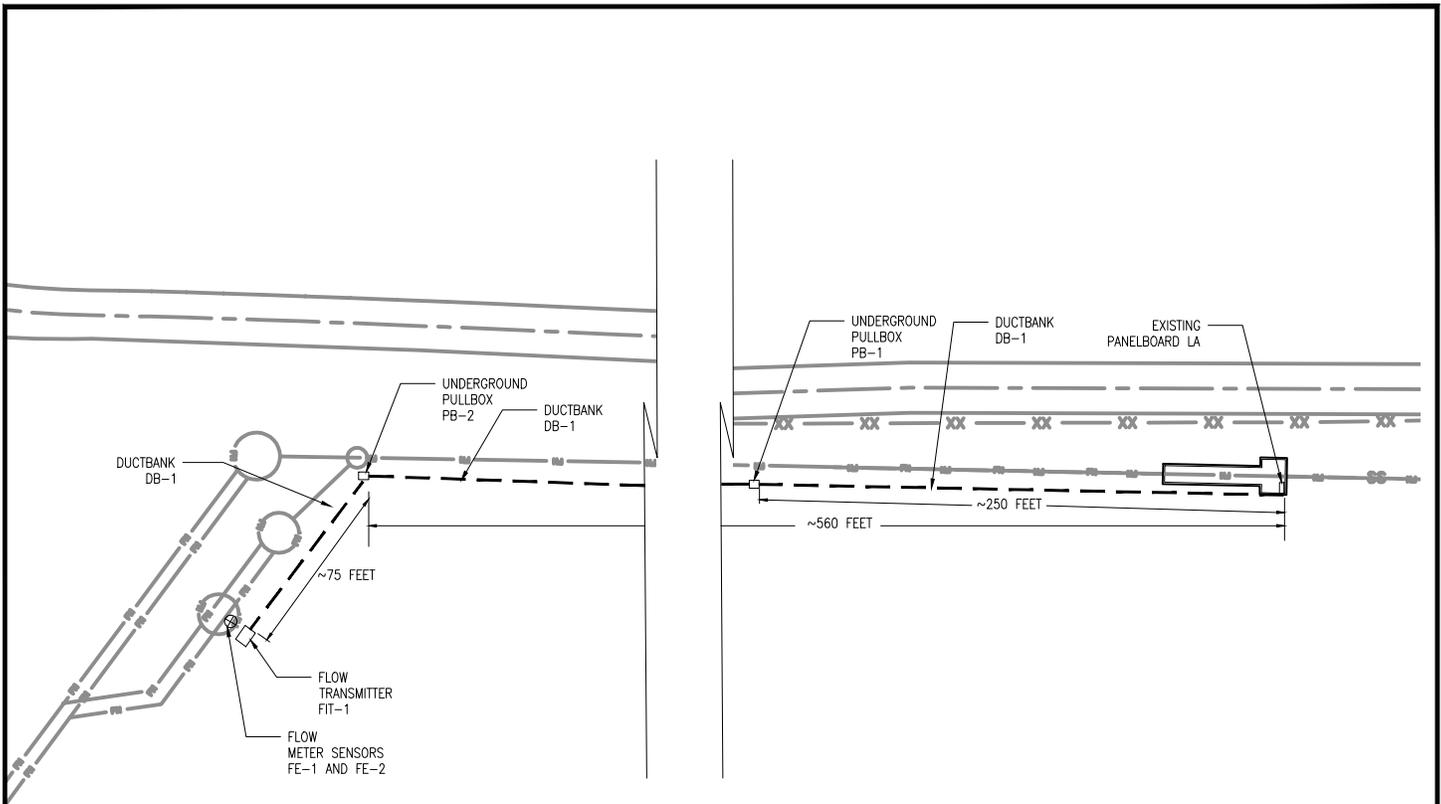
MANDATORY BID ALTERNATE "A"



EX-2.1

8' DIA. MANHOLE DETAILS

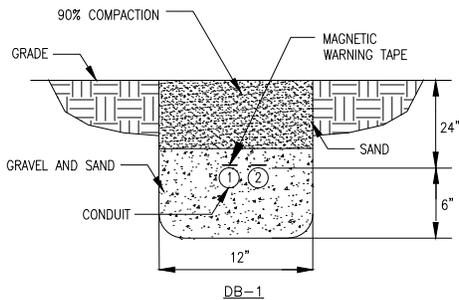
TANNER'S BRIDGE ROAD LAND APPLICATION SYSTEM MECHANICAL SCREENING FACILITIES PROJECT #SS016



1 **TANNERS BRIDGE ELECTRICAL SITE PLAN**

GENERAL NOTES:

1. SCOPE:
 - A. FURNISH ALL LABOR, MATERIAL, EQUIPMENT AND TOOLS REQUIRED TO COMPLETE INSTALLATION OF THE ELECTRICAL SYSTEM INCLUDING BUT NOT LIMITED TO WIRING, BOXES, LIGHT FIXTURES, PANELS, SWITCHES, RECEPTACLES, DISCONNECTS, STARTERS, AND ALL OTHER WORK INDICATED ON THE DRAWINGS OR AS SPECIFIED HEREIN.
 - B. OBTAIN ALL PERMITS, INSPECTIONS, AND APPROVALS AS REQUIRED BY THE LOCAL AUTHORITIES HAVING JURISDICTION AND DELIVER CERTIFICATE OF APPROVAL TO THE GENERAL CONTRACTOR. ALL ASSOCIATED FEES SHALL BE PAID BY THE CONTRACTOR.
 - C. ALL MATERIALS AND EQUIPMENT OF THE ELECTRICAL SYSTEM NECESSARY FOR ITS PROPER AND SAFE OPERATION OR OTHERWISE REQUIRED BY CODE, BUT NOT SPECIFICALLY MENTIONED OR SHOWN ON THE DRAWINGS, SHALL BE FURNISHED AND INSTALLED WITHOUT ADDITIONAL CHARGE.
 - D. WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF NATIONAL ELECTRICAL CODE, THE LATEST STANDARD BUILDING CODE, NFPA 820, ANY OTHER LOCALLY ADOPTED CODES AND LOCAL AUTHORITIES HAVING JURISDICTION.
2. ALL SUBSTITUTIONS FOR EQUIPMENT AND MATERIAL SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO INSTALLATION.
3. CONTRACTOR SHALL COORDINATE ALL WORK WITH ALL OTHER TRADES. IT IS THE RESPONSIBILITY OF CONTRACTOR TO VERIFY THE ACTUAL LOCATION OF EQUIPMENT, DUCTWORK, PIPING, ETC. AND COORDINATED THE INSTALLATION ACCORDINGLY. THE EQUIPMENT WIRING SHALL INCLUDE ALL NECESSARY CABLES AND CONDUIT REQUIRED FOR THE PROPER AND SAFE EQUIPMENT OPERATION.
4. ALL CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM CONDUCTOR SIZE FOR POWER AND LIGHTING WIRING. USE #14 AWG MINIMUM CONDUCTOR FOR SIGNAL WIRING. THE INSULATION FOR ALL CONDUCTORS SHALL BE THWN-2. SERVICE ENTRANCE CONDUCTORS SHALL BE XHHW. ALL CABLE INSTALLED IN CABLE TRAYS SHALL BE TC RATED.
5. POWER WIRES SIZES #12 AWG AND #10 AWG SHALL BE SOLID TYPE. ALL OTHER SIZES SHALL BE STRANDED. CABLES BETWEEN THE VFD AND ASSOCIATED MOTOR SHALL BE SHIELDED POWER VFD RATED CABLES.
6. ALL EXPOSED CONDUITS SHALL BE GALVANIZED RIGID STEEL, UNLESS NOTED OTHERWISE ON THE DRAWINGS, MINIMUM OF 3/4". ALL BURIED CONDUIT SHALL BE PVC-40, MINIMUM OF 1". ALL UNDERGROUND CONDUITS SHALL HAVE RIGID STEEL ELBOWS.
7. ALL FITTINGS SHALL BE CAST WITH THREADED HUBS. ALL CONNECTIONS SHALL BE COMPRESSION TYPE.
8. CONTRACTOR SHALL PROVIDE PULL STRING AND IDENTIFICATION LABELS AT EACH CONDUIT END FOR ALL SPARE CONDUITS.
9. CONTRACTOR SHALL PROVIDE ALL REQUIRED PULLBOXES AND/OR CONDULETS TO MEET NEC ARTICLE 314 FOR CABLE PULLS.
10. ALL UNDERGROUND PULL BOXES SHALL HAVE ACCESS COVERS AND SHALL BE RATED FOR IN-GROUND INSTALLATION.



- DB-1
- 1 - 1" (120V POWER TO FLOW TRANSMITTER)
 - 2 - 1" (SPARE FUTURE SCADA)

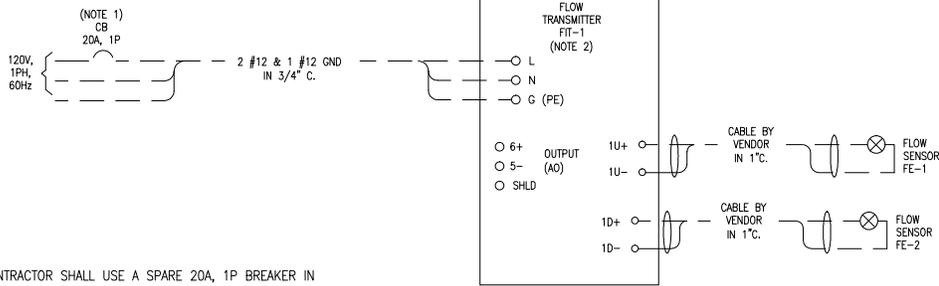
MANDATORY BID ALTERNATE "A"



EX-3

ELECTRICAL SITE PLAN

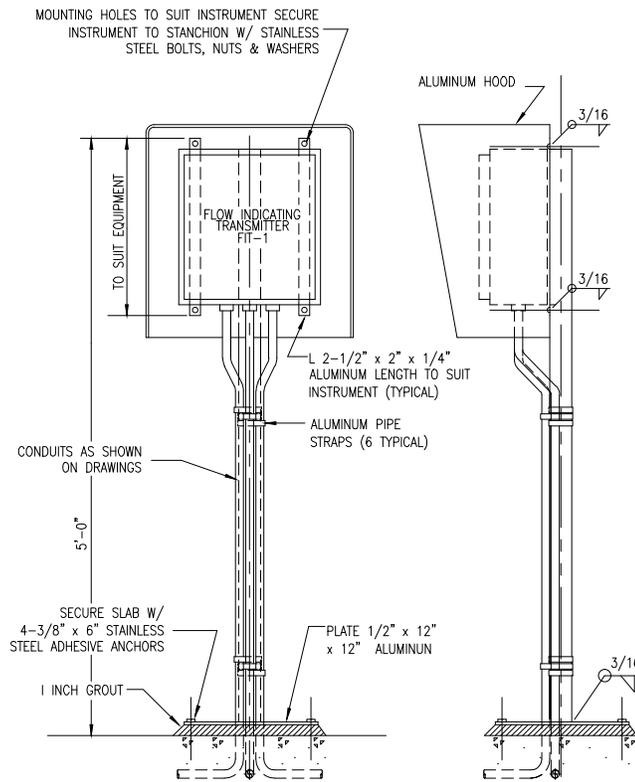
TANNER'S BRIDGE ROAD LAND APPLICATION
SYSTEM MECHANICAL SCREENING FACILITIES
PROJECT #SS016



NOTES:

1. CONTRACTOR SHALL USE A SPARE 20A, 1P BREAKER IN EXISTING PANELBOARD "LA" FOR 120V POWER TO THE FLOW TRANSMITTER
2. THE FLOWMETER SHALL BE "FLEXIM" MODEL ADM5207 DUAL CHANNEL WATER FLOWMETER WITH 2 SETS OF ULTRASONIC FLOW TRANSDUCERS #MSL7 OR APPROVED EQUAL.

1 FLOW TRANSMITTER SCHEMATIC



2 FLOW TRANSMITTER INSTALLATION

- NOTE:
1. ALL EXPOSED EDGES TO BE GROUND SMOOTH AND BURR FREE.
 2. PAINT ALL ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.

MANDATORY BID ALTERNATE "A"



EX-4

FLOW METER DETAILS

TANNER'S BRIDGE ROAD LAND APPLICATION SYSTEM MECHANICAL SCREENING FACILITIES PROJECT #SS016

COUNTY OF BARROW

STATE OF GEORGIA

BARROW COUNTY ETHICS ORDINANCE

AN ORDINANCE TO AMEND THE CODE OF ORDINANCES OF BARROW COUNTY, TO ESTABLISH THE CODE OF ETHICS FOR BARROW COUNTY; TO FURTHER AND INCORPORATE THE POLICIES AND LAWS OF THE STATE OF GEORGIA RELATING TO ETHICAL STANDARDS; TO CREATE THE BOARD OF ETHICS AND PROVIDE FOR ITS CONSTITUENT MEMBERSHIP, DUTIES, AND RESPONSIBILITIES; TO PROVIDE FOR THE INVESTIGATION OF ETHICS COMPLAINTS; TO PROVIDE FOR THE ENFORCEMENT OF ETHICAL STANDARDS; TO PROVIDE FOR SEVERABILITY; TO PROVIDE FOR AN EFFECTIVE DATE; AND FOR OTHER PURPOSES.

WHEREAS, the Constitution of the State of Georgia, approved by the voters of the State in November of 1982, and effective July 1, 1983, provides in Article IX, Section II, Paragraph I Thereof, that the governing authority of the county may adopt clearly reasonable ordinances, resolutions and regulations;

WHEREAS, O.C.G.A. § 36-1-20 authorizes counties to enact ordinances for protection and preserving the public health, safety and welfare of the population of the unincorporated areas of the County;

WHEREAS, the governing authority of Barrow County, to wit, the Board of Commissioners, desires to exercise its authority in adopting this Ordinance;

WHEREAS, it is essential to the proper operation of democratic government that public officials of independent and impartial, that governmental decisions and policy be made in the proper channels of the governmental structure, that public office not be used for private gain other than the remuneration provided by law, and that there be public confidence in the integrity of government;

WHEREAS, the attainment of one or more of these ends is impaired whenever there exists a conflict between the private interests of an elected official or a governmental employee and his duties as such;

WHEREAS, the public interest, therefore, requires that the law protect against such conflicts of interest and establish appropriate ethical standards with respect to the conduct of elected officials and government employees in situations where conflicts exist;

WHEREAS, it is also essential to the proper operation of government that those best qualified be encouraged to serve the government. Accordingly, legal safeguards against conflicts of interest must be so designed as not unnecessarily or unreasonably to impede the recruitment and retention by the government of those men and women who are best qualified to serve it;

WHEREAS, an essential principle underlying the staffing of our government structure is that its elected officials and employees should not be denied the opportunity, available to all other citizens, to acquire and retain private economic and other interests, except where conflicts with the responsibility of such elected officials and employees to the public cannot be avoided;

WHEREAS, in recognition of these goals and principles, it is the policy of the Board of Commissioners to institute, establish, promote and enforce standards of ethical conduct for all of Barrow County's officers and employees; and

WHEREAS, it is a further policy of the Board of Commissioners that the proper administration of Barrow County's government and the promotion and enforcement of standards of ethical conduct for Barrow County's officers and employees would be best served by the creation of a Barrow County Board of Ethics for the investigation of complaints related to ethical standards;

NOW, THEREFORE, BE IT ORDAINED AND RESOLVED BY THE BOARD OF COMMISSIONERS OF BARROW COUNTY, GEORGIA AS FOLLOWS:

ARTICLE ONE: GENERAL PROVISIONS

Section One. Short Title.

This Ordinance shall be known as "The Barrow County Ethics Ordinance," and may be Cited and referred to as such.

Section Two. Definitions.

For the purposes of this Ordinance, the following terms, phrases, words and their derivations shall have the meaning provided herein. When no inconsistent with the context, words used in the present tense include the future, words in the plural number included the singular number and words in the singular number include the plural number.

- (A) **"Board"** means the Barrow County Board of Commissioners.
- (B) **"Board of Ethics"** means the Barrow County Board of Ethics as formed and described herein.
- (C) **"Business Entity"** means any business of whatever nature regardless of how designated or formed, whether a sole proprietorship, partnership, joint venture, association, trust, corporation, limited liability company, or any other type of business enterprise and whether a person acting on behalf of, or as a representative or agent of, the business entity.
- (D) **"Confidential Information"** means any information that, by law or practice, is not reasonably available to the public.
- (E) **"County Official"** means the Barrow County Board of Commissioners, any member of a board, commission or authority appointed by the Board, the Chief of

Operations or his/her equivalent and any other elected or appointed officer or employee of Barrow County, including those employees who are exempt from the Barrow County Civil Service System, except to the extent prohibited by law.

- (F) **“Employee”** means all those persons employed on a regular or part-time basis by The County, as well as those persons whose services are retained under the terms of a contract with the County, including those employees who are exempt from the Barrow County Civil Service System, except to the extent prohibited by law.
- (G) **“Family”** means the spouse, parents, children, brothers and sisters, related by blood or marriage of a county official or employee.
- (H) **“Interest”** means direct or indirect pecuniary or material benefit accruing to a County Official or Employee as a result of a contract or transaction which is or may be the subject of an official act or action by or with the County, except for such contracts or transactions which, by their terms and by the substance of their provisions, confer the opportunity and right to realize the accrual of similar benefits to all other persons and/or property similarly situated. The term “interest” shall not include any remote interest. For purposes of this Ordinance, a County Official or Employee shall be deemed to have an interest in the affairs of:
- (1) His or her family;
 - (2) Any business entity in which the county official or employee is a member, officer, director, employee or prospective employee;
 - (3) Any business entity as to which the stock, legal ownership, or beneficial ownership of a county official or employee is in excess of five percent (5%) of the total stock or total legal and beneficial ownership, or which is

controlled or owned directly or indirectly by the county official or employee.

- (l) **“Official Act” or “Official Duties”** means any legislative, administrative, appointive or discretionary act of any County Official or Employee of the County or any agency, board, authority or commission thereof.

ARTICLE TWO: CODE OF ETHICS FOR COUNTY SERVICE GENERALLY AND FOR EMPLOYEES

This Article Two is intended to adopt and incorporate herein for local enforcement the ethical standards of O.C.G.A. § 45-10-1, as it may be amended from time to time.

Any person in County service shall;

Section One.

Put loyalty to the highest moral principles and to country above loyalty to person, party, or government department.

Section Two.

Uphold the Constitution, laws and legal regulations of the United States and the State of Georgia and of all governments therein and never be a party to their evasion.

Section Three.

Give a full day's labor for a full day's pay and give to the performance of his duties his earnest effort and best thought.

Section Four.

Seek to find and employ more efficient and economical ways of getting tasks accomplished.

Section Five

Never discriminate unfairly by the dispensing of special favors or privileges to anyone, whether for remuneration or not, and never accept, for himself or his family, favors or benefits under circumstances which might be construed by reasonable persons as influencing the performance of his governmental duties.

Section Six

Make no private promises of any kind binding upon the duties of office, since a government employee has no private word that can be binding on public duty.

Section Seven.

Engage in no business with the government, either directly or indirectly, which is inconsistent with the conscientious performance of his governmental duties.

Section Eight.

Never use any information coming to him confidentially in the performance of governmental duties as a means for making private profit.

Section Nine.

Expose corruption wherever discovered.

Section Ten.

Uphold these principles, ever conscious that public office is a public trust.

ARTICLE THREE: CODE OF ETHICS FOR COUNTY OFFICIALS AND DEPARTMENT DIRECTORS

This Article Three is intended to adopt and incorporate herein for local enforcement the ethical standards of O.C.G.A. § 45-10-3, as it may be amended from time to time.

All County Officials and Department Directors shall:

Section One.

Uphold the Constitution, laws and regulations of the United States, the State of Georgia, the County of Barrow and all governments therein and never be a party to their evasion.

Section Two.

Never discriminate by the dispensing of special favors or privileges to anyone, whether or not for remuneration.

Section Three.

Not engage in any business with the government, either directly or indirectly, which is inconsistent with the conscientious performance of his governmental duties.

Section Four.

Never use any information coming to him confidentially in the performance of governmental duties as a means for making private profit.

Section Five.

Expose corruption wherever discovered.

Section Six.

Never solicit, accept, or agree to accept gifts, loans, gratuities, discounts, favors, hospitality or services from any person, association or corporation under circumstances from which it could reasonably be inferred that a major purpose of the donor is to influence the performance of the member's official duties.

Section Seven.

Never accept any economic opportunity under circumstances where he knows or should know that there is a substantial possibility that the opportunity is being afforded him with intent to influence his conduct in the performance of his official duties.

Section Eight.

Never engage in other conduct which is unbecoming to a member or which constitutes a breach of public trust.

Section Nine.

Never take any official action with regard to any matter under circumstances in which he knows or should know that he has a direct or indirect monetary interest in the subject matter of such matter or in the outcome of such official action.

ARTICLE FOUR: SPECIFIC PROVISIONS RELATED TO CONFLICT OF INTEREST TRANSACTIONS AND DISCLOSURES

The following provisions related to conflict of interest transactions and disclosures are intended to supplement and elaborate upon the Code of Ethics set forth in Articles Two and Three above and all such provisions shall be read and interpreted in accordance therewith.

Section One. Compliance with Applicable Law.

No County Official or Employee shall engage in any activity or transaction that is prohibited by law, now existing or hereafter enacted, which is applicable to him or her by virtue of his or her office or employment. Other provisions of law or regulations shall apply when any provisions of this Ordinance shall conflict with the laws of the State of Georgia or the United States, except to the extent that this Ordinance permissibly sets forth a more stringent standard of conduct. The laws of the State of Georgia or the United States shall apply when this Ordinance is silent.

Section Two. Conflict of Interest Transactions.

- (A) No County Official or Employee shall acquire or maintain an interest in any contract or transaction if a reasonable basis exists that such an interest will be affected directly by his or her official act or action or by official acts or actions of

the County, which the County Official or Employee has a reasonable opportunity to influence, except consistent with the disclosure and abstention provisions set forth herein.

(B) Barrow County shall not enter into any contract involving services or property with a County Official or Employee or with a business entity in which the County Official or an Employee has an interest. Provided that the disclosure and abstention provisions set forth herein are followed, this paragraph shall not apply to the following:

- (1) The designation of a bank or trust company as a depository for county funds;
- (2) The borrowing of funds from any bank or lending institution which offers competitive rates for such loans;
- (3) Contracts entered into with a business which employs a consultant, provided that the consultant's employment with the business is not incompatible with this Ordinance;
- (4) Contracts for services entered into with a business which is the only available source for such goods or services; and
- (5) Contracts entered into under circumstances that constitute an emergency situation, provided that a record explaining the emergency is prepared by the Board and submitted to the Chief of Operations (or his/her equivalent) to be kept on file.

Section Three. **Financial Disclosures.**

Financial disclosures shall be governed by federal and state law as it may be amended from time to time and this Ordinance shall not require any additional financial disclosure reports to be filed other than those required by federal and state law.

Section Four. **Zoning Application Disclosures.**

All disclosures with regard to zoning applications shall be governed in their entirety by the Conflict of Interest in Zoning Actions provisions contained in O.C.G.A. § 36-67A-1, et seq., as it may be amended from time to time.

Section Five. **Disclosures Related to Submission of Bids or Proposals for County Work or Contract.**

Persons submitting bids or proposals for county work who have contributed \$250.00 or more to a County Official must disclose on their bid or proposal the name of the County Official(s) to whom the contribution was made and the amount contributed. Such a disclosure must also be made prior to a request for any change order or extension of any contract awarded to the person who submitted the successful bid or proposal.

Section Six. **Withholding of Information.**

No County Official or Employee shall knowingly withhold any information that would impair the proper decision making of the Board or any of the County's boards, agencies, authorities or departments.

Section Seven. **Incompatible Service.**

No County Official or Employee shall engage in or accept private or public employment or render service for any private or public entity, when such employment or service is incompatible with the proper discharge of his or her official duties or would tend to impair his or her independence of judgment or action in the performance of his or her official duties, unless

otherwise permitted by law and unless public disclosure is made.

Section Eight. **Unauthorized Use of Public Property.**

No County Official or Employee shall request or permit the unauthorized use of county-owned vehicles and equipment, including but not limited to computers, pagers and cellular telephones, materials or property for personal convenience or profit.

Section Nine. **Political Recrimination and Activity.**

- (A) No County Official or Employee, whether elected or appointed, shall either cause the dismissal or threaten the dismissal from any county position as a reward or punishment for any political activity. No County Official or Employee shall direct any person employed by the County to undertake political activity on behalf of such County Official or Employee, any other County Official or Employee, or any other individual, political party, group or business organization, during such time that the Employee is required to conduct county business. This section does not prohibit incidental telephone calls made for the purpose of scheduling a County Official's daily county business.
- (B) Employees of the county are encouraged to exercise their right to vote, but no employee shall make use of government time or equipment to aid a political candidate, party or cause; or use a government position to influence, coerce, or intimidate any person in the interest of a political candidate, party or cause. No employee shall be hired, promoted, favored or discriminated against with respect to employments because of his or her political opinions or affiliations.
 - (1) *Seeking elective office.* A government employee seeking elective office within the county may, upon declaring candidacy, either resign or submit a

request in writing to the Chief of Operations (or his/her equivalent) for a leave of absence without pay from the date of his or her announcement through the duration of the campaign or announcement of the election results. In the alternative, the government employee seeking elective office within the County may continue to work for the County, provided, however, that the employee shall not engage in election activities during his or her County working hours or with use of County equipment. If elected to office, the employee shall immediately, upon the date of election, be separated from employment with the county upon written request and approval of the Chief of Operations (or his/her equivalent).

(2) *Political campaign involvement.* A government employee may not be involved in any political activity which would constitute a conflict of interest; including participation in any aspect of any political campaign for any office in Barrow County Government.

(3) *Solicitation of contributions.* A government employee may not knowingly solicit, accept or receive political contributions from any person, to be used in support of or opposition to any candidate for office in the county.

Section Ten. **Appearance Before County Entities.**

No County Official or Employee shall appear on behalf of any private person other than himself or herself, his or her spouse, or his or her minor children, before any county agency, authority or board. However, a member of the Board of Commissioners may appear before such groups on behalf of his constituents in the course of his duties as a representative of the electorate or in the performance of public or civic obligations.

Section Eleven. Timely Payment of Debts to the County and Fiscal Responsibility.

All County Officials and Employees shall pay and settle, in a timely and prompt fashion, all accounts between them and Barrow County, including the prompt payment of all taxes and shall otherwise demonstrate personal fiscal responsibility.

Section Twelve. Solicitation or Acceptance of Gifts.

- (A) County Officials and employees shall not accept gifts, gratuities or loans from organizations, business concerns, or individuals with whom he or she has official relationships on business of the county government. These limitations are not intended to prohibit the acceptance of articles of negligible value which are distributed generally, nor to prohibit employees from accepting social courtesies which promote good public relations, or to prohibit employees from obtaining loans from regular lending institutions. It is particularly important that inspectors, contracting officers and enforcement officers guard against relationships which might be construed as evidence of favoritism, coercion, unfair advantage or collusion.
- (B) Consistent with the provisions set forth in Articles Two and Three and Section 12(A) above, there shall be no violation of this Ordinance in the following circumstances:
- (1) Meals and beverages given in the usual course of entertaining associated with normal and customary business or social functions.
 - (2) An occasional gift from a single source of \$101.00 or less in any calendar year.
 - (3) Ceremonial gifts or awards.

- (4) Gifts of advertising value only or promotional items generally distributed
To public officials.
- (5) Awards presented in recognition of public service.
- (6) Reasonable expenses of food, travel, lodging and scheduled entertainment
for a meeting that is given in return for participation in a panel or speaking
engagement at the meeting.
- (7) Courtesy tickets or free admission extended for an event as a courtesy or
for ceremonial purposes, given on an occasional basis and not to include
season tickets of any nature.
- (8) Gifts from relatives or members of the County Official or Employee's
household.
- (9) Honorariums or awards for professional achievement.
- (10) Courtesy tickets or free admission to educational seminars, educational or
information conventions or other similar events.

Section Thirteen. Disclosure of Interest.

Any member of the Board who has a financial or personal interest in any proposed legislation or action before the Board shall immediately disclose publicly the nature and extent of such interest.

Any other County Official or Employee who has a financial or personal interest in any proposed legislation or action before the Board and who participates in discussion with or gives an official opinion or recommendation to the Board in connection with such proposed legislation or action shall disclose publicly the nature and extent of such interest.

Section Fourteen. Abstention to Avoid Conflicts of Interest.

- (A) Except as otherwise provided by law, no County Official or Employee shall participate in the discussion, debate, deliberation, vote or otherwise take part in the decision-making process on any item before him in which the County Official or Employee has a conflict of interest as set forth above.
- (B) To avoid the appearance of impropriety, if any County Official or Employee has a conflict of interest or has an interest that he or she has reason to believe either violates this Ordinance or may affect his or her official acts or actions in any matter, the County Official or Employee shall immediately leave the meeting room, except that if the matter is being considered at a public meeting, the County Official or Employee may remain in the meeting room.
- (C) In the event of a conflict of interest, the County Official or Employee shall announce his or her intent to abstain prior to the beginning of the discussion, debate, deliberation or vote on the item, shall not participate in any way, and shall abstain from casting a vote.

ARTICLE FIVE: THE BOARD OF ETHICS

Section One. Creation and Composition of Board of Ethics.

There is hereby created a five-member Barrow County Board of Ethics, which shall consist of the following members:

- (A) One appointee by the Board of Directors of the Barrow County Chamber of Commerce.
- (B) One appointee selected by a majority of the voting County elected officials (not including the members of the Board of Commissioners) who shall each have one vote for such appointee:

- (C) One appointee selected by a majority of the voting employees of Barrow County (not including the County elected officials or the members of the Board of Commissioners) who are in the employ of Barrow County on a full-time basis on The effective date of the vote, which vote shall be conducted by the Director of Human Resources or his/her designee;
- (D) One appointee of the Barrow County Personnel Review Board; and
- (E) One appointee of the Barrow County Board of Commissioners, which appointee Shall be selected by a majority vote of the Board of Commissioners.

Section Two. **Appointment Procedures.**

The initial appointments of the members of the Board of Ethics shall be accomplished as follows: Within five (5) business days of the effective date of this Ordinance, the Barrow County Chief of Operations (or his/her equivalent) or his/her designee shall notify the respective appointing body or individuals of the duty to appoint or vote upon a member for placement on the Board of Ethics. The body or individuals so notified shall have thirty (30) days in which to conduct their appointment process and provide the Chief of Operations (or his/her equivalent) with the name of the appointment, or the name of the individual for whom he or she is voting as the appointee in the case of the elected officials. Within five (5) business days of receipt of the appointment information or calculation of the votes as the case may be, the Chief of Operations (or his/her equivalent) shall thereafter provide the names of the appointees to the Board of Commissioners. The Board of Commissioners shall appoint the five persons so identified at the next regular meeting of the Board of Commissioners following receipt of the names of the appointees from the Chief of Operations (or his/her equivalent).

All appointments following the expiration of the initial terms and all appointments made

In the cases of vacancies created during a particular term shall be made by the applicable body or individuals as indicated in Section One of this Article. The Chief of Operations (or his/her equivalent) or his/her designee shall notify the applicable body or individuals responsible for making an appointment at least forty-five (45) days prior to the expiration of the respective term or immediately upon knowledge of a vacancy created during a term. Upon such notification, the appointment process shall proceed as set forth above in this Section.

Section Three. **Qualifications of Members of Board of Ethics.**

A person is eligible to be appointed as a member of the Board of Ethics if the person, while serving:

- (A) Resides in the County and is a registered voter;
- (B) Is not an Employee or County Official and has not been an Employee or County Official during the three (3) months immediately preceding his or her appointment
Or be the spouse, parent, child or sibling of an Employee or County Official;
- (C) Is not an officer or employee of any political party;
- (D) Does not hold any elected or appointed office and is not a candidate for office of the United States, this State or the County and has not held any elected or appointed office during the three (3) months immediately preceding his or her appointment.

Section Four. **Terms; Vacancies.**

Members of the Board of Ethics shall each serve a two (2) year term without compensation, and shall continue to serve until their successors are appointed and qualified. The Board positions appointed pursuant to sub-sections (A), (B), and (C) of Section One of this

Article shall serve an initial full two-year term and shall thereafter serve two-year terms upon appointment. The Board positions appointed pursuant to sub-sections (D) and (E) of Section One of this Article shall serve an initial one-year term and shall thereafter serve two-year terms upon appointment. If any vacancy occurs during a term, the remaining members shall at that time choose an alternate member mutually agreed upon to temporarily serve until the position is filled by appointment as provided in Section One and Section Two to fulfill the remainder of the then existing term.

Section Five. **Removal of Member.**

The Board of Commissioners may remove a member of the Board of Ethics on the grounds of neglect of duty, misconduct in office or engagement in political activity in violation of this Ordinance. Before initiating the removal of a member from the Board of Ethics, the Board of Commissioners shall give the member written notice of the reason for the intended action and the member shall have the opportunity to reply. Thereafter, the Board of Commissioners shall afford such member an opportunity for a hearing before the Board of Commissioners.

Section Six. **Organization and Internal Operating Regulations.**

- (A) Members of the Board of Ethics shall not be compensated.
- (B) The Board of Ethics shall elect one of its members to act as Chairperson for a term of one year or until a successor is duly elected. The Board of Ethics shall also elect one of its members to act as Vice-Chairperson for the same term and to act for the Chairperson in his or her absence, because of disqualification or vacancy.
- (C) There shall be no regularly scheduled monthly or bimonthly meetings of the

Board of Ethics, however, the Board of Ethics shall meet at least once annually in January of each year for purposes of election of officers and such other business as the Board of Ethics deems proper and in accordance with this Ordinance. Meetings shall be called by majority vote or by call of the chairperson. Meetings of the Board of Ethics shall be conducted in the public hearing room utilized by the Board of Commissioners, shall be duly publicized, and shall be otherwise conducted in accordance with the open meetings requirements under state law.

- (D) Three members of the Board of Ethics shall constitute a quorum for the transaction of business. The Chairperson shall be entitled to the same voting rights as the other members of the Board of Ethics.
- (E) No official action concerning complaints shall be taken by the Board of Ethics, except by the affirmative vote of at least four (4) members of the Board of Ethics.

Section Seven. Duties and Powers.

The Board of Ethics shall have the following duties and powers:

- (A) To establish any procedures, rules and regulations governing its internal organization and conduct of its affairs, provided that such procedures, rules and regulations do not conflict with any provision contained herein.
- (B) To receive and hear complaints of violations of standards required by this Ordinance.
- (C) To make investigations as it deems necessary to determine whether any person has violated this Ordinance, but only after a least four (4) members of the Board of Ethics have voted affirmatively to conduct the investigation.
- (D) To take such action as provided in this Ordinance as deemed appropriate because of any violation of this Ordinance.

- (E) To perform any other function authorized by this Ordinance.
- (F) To issue advisory opinions as provided in this Ordinance.

Section Eight. Staffing and Expenses.

The Board of Ethics shall be provided sufficient meeting space and other reasonable supportive services to carry out its duties required under this Ordinance. The Chief of Operations (or his/her equivalent) shall designate an administration employee who shall serve as the filing clerk for the Board of Ethics and who shall be authorized to receive all filings before the Board of Ethics to publish notices of all meetings upon request of the Board of Ethics' Chairperson and to serve as the recording clerk for the Board of Ethics.

Section Nine. Counsel.

The Board of Ethics may petition the Barrow County Board of Commissioners for appointment of counsel on a case-by-case basis to assist it in carrying out its responsibilities or to act as a hearing officer. Any such appointed counsel shall be approved by the Board of Commissioners, shall perform services at an approved hourly rate, and shall serve at the joint pleasure of the Board of Ethics and the Board of Commissioners.

Section Ten. Adherence to the Ethics Ordinance.

The Board of Ethics shall be governed by and subject to this Ordinance, except as to any requirements related to financial disclosures. If a member of the Board of Ethics has a conflict of interest or must disqualify himself under this Ethics Code or by law, the remaining members shall at that time choose an alternate person mutually agreed upon to hear that matter.

Section Eleven. Prohibition Against Certain Conflicting Political Activity.

- (A) **Definitions.** The following words, terms and phrases, when used in this section, shall have the meanings ascribed to them, except where the context clearly indicates a different meaning:
- (1) **“Member of the Board of Ethics”** means an individual who occupies the position of a member of the Board of Ethics or a prospective member of the Board of Ethics.
 - (2) **“Political Party”** means a national political party, a state political party, a political action committee, and/or any affiliated organization.
 - (3) **“Election”** includes a primary, special and general election.
 - (4) **“Nonpartisan Election”** means:
 - (a) An election at which none of the candidates is to be nominated or elected as representing a political party, any of whose candidates for presidential elector received votes in the last preceding election at which presidential electors were selected; and
 - (b) An election involving a question or issue which is not specifically identified with a political party, such as a constitutional amendment, referendum, approval of a governmental ordinance, or any question or issue of similar character
 - (5) **“Partisan”** when used as an adjective, refers to a political party.
 - (6) **“Political Fund”** means any fund, organization, political action committee or other entity that, for purposes of influencing in any way the outcome of any partisan election, receives or expends money or

anything of value or transfers money or anything of value to any other fund, political party, candidate, organization, political action committee or other entity.

- (7) “**Contribution**” means any gift, subscription, loan, advance, deposit of money, allotment of money, or anything of value given or transferred by one person to another, including in cash, by check, by draft, through a payroll deduction or allotment plan, by pledge or promise, whether or not enforceable, or otherwise.

(B) **Permissible Activities.** All members of the Board of Ethics are free to engage in political activity to the widest extent consistent with the restrictions imposed in this Section, which restrictions are imposed for the sole purpose of ensuring neutrality and the appearance of neutrality of the Board of Ethics. Each member of the Board of Ethics retains the right to:

- (1) Register and vote in any election;
- (2) Participate in the nonpartisan activities of a civic, community, social, labor, or professional organization or of a similar organization;
- (3) Be a member of a political party or other political organization and participate in its activities to the extent consistent with law;
- (4) Attend a political convention, rally, fundraising function, or other political gathering;
- (5) Sign a political petition as an individual;
- (6) Make a financial contribution to a political party or organization;
- (7) Take an active part, as a candidate or in support of a candidate, in a

nonpartisan election;

- (8) Be politically active in connection with a question which is not specifically identified with a political party, such as a constitutional amendment, referendum, approval of a governmental ordinance or any other question or issue of a similar character;
- (9) Serve as an election judge or clerk or in a similar position to perform nonpartisan duties as prescribed by state or local law; and
- (10) Otherwise participate fully in public affairs in a manner which does not materially compromise his or her efficiency or integrity as a member of the Board of Ethics or the neutrality, efficiency or integrity of the Board of Ethics.

(C) Prohibited Activities.

- (1) A member of the Board of Ethics may not take an active part in political management or in a political campaign, except as permitted by subsection of this section.
- (2) A member of the Board of Ethics shall not take part in or be permitted to do any of the following activities:
 - (a) Serve as an officer of a political party, a member of a national, state or local committee of a political party, an officer or member of a committee of a partisan political club, or be a candidate for any of these positions;
 - (b) Organize or reorganize a political party organization or political club;
 - (c) Directly or indirectly solicit, receive, collect, handle, disburse, or

account for assessments, contributions or other funds for a partisan political purpose;

- (d) Organize, sell tickets to, promote or actively participate in a fundraising activity of a candidate in a partisan election or of a political party or political club;
- (e) Take an active part in managing the political campaign of a Candidate for public office in a partisan election or a candidate for political party office;
- (f) Become a candidate for, or campaign for, an elective public office In a partisan election;
- (g) Solicit votes in support of or in opposition to a candidate for Public office in a partisan election;
- (h) Act as recorder, watcher, challenger or similar officer at the polls on behalf of a political party or a candidate in a partisan election;
- (i) Drive voters to the polls on behalf of a political party or a candidate in a partisan election;
- (j) Endorse or oppose a candidate for public office in a partisan election or a candidate for political party office in a political advertisement, broadcast, campaign literature, or similar material;
- (k) Serve as a delegate, alternate or proxy to a political party convention;
- (l) Address a convention, caucus, rally or similar gathering of a political party in support of or in opposition to a partisan

candidate for public office or political party office;

(m) Initiate or circulate a partisan nominating position.

- (3) Nothing contained in this section shall prohibit activity in political management or in a political campaign by any member of the Board of ethics connected with a nonpartisan election or a nonpartisan issue of any type.

Section Twelve. Limitation of Liability.

No member of the Board of Ethics, or any person acting on behalf of the Board of Ethics, shall be liable to any person for any damages arising out of the enforcement or operation of this Ethics Ordinance, except in the case of willful or wanton conduct. This limitation of liability shall apply to the County, the members of the Board of Ethics, the employees of the Board of Ethics and any person acting under the direction of the Board of Ethics.

Section Thirteen. Advisory Opinion.

The Board of Ethics shall render an advisory opinion based on a real or hypothetical set of circumstances when requested to do so in writing by a County Official or Employee related to that County Official's or Employee's conduct or transaction of business. Such advisory opinions shall be rendered pursuant only to a written request, fully setting forth the circumstances to be reviewed by the Ethics Board. The proceedings of the Ethics Board pursuant to this section shall be held in public to the extent consistent with state law and the opinions of the Ethics Board shall be made available to the public.

Section Fourteen. Complaints.

The Board of Ethics shall be responsible for hearing and deciding any complaints filed regarding alleged violations of this Ordinance by any person. The following procedures shall be followed when filing a complaint:

- (A) Any person may file a complaint alleging a violation of any of the provisions of This Ordinance by submitting it to the Chief of Operations (or his/her equivalent), who shall immediately deliver such complaint to the Chairman of the Board of Ethics or his or her designee. A copy of such complaint shall immediately be forwarded by registered mail to the County Official or Employee against whom the complaint was filed. The complaint must be supported by affidavits based on personal knowledge, shall set forth such facts as would be admissible in evidence, and shall show affirmatively that the affiant is competent to testify to the matters stated therein. All documents referred to in an affidavit(s) should be attached to the affidavits(s). The person filing the complaint shall verify the complaint by his or her signature thereon. A complaint must be filed within six (6) months of the date the alleged violation is said to have occurred, or in case of concealment or nondisclosure within six (6) months of the date the alleged violation should have been discovered after due diligence. In the event the Board of Ethics makes an initial determination that a complaint is technically deficient, the Board of Ethics shall submit a list of deficiencies to the complainant and offer the complainant the opportunity to correct the deficiencies within seven (7) days prior to the complaint being dismissed for technical deficiencies.
- (B) Upon receipt of a complaint alleging misconduct, the County Official or Employee against whom the complaint was filed may reply to the complaint within thirty (30) days, unless such time for reply is extended by the Board of Ethics upon good cause shown. The response of the County Official or Employee must be supported by affidavits based on personal knowledge, must set forth such facts as would be admissible in evidence and must show

affirmatively that the affiant is competent to testify to the matters stated therein.

All documents referred to in an affidavit(s) should be attached to the affidavit(s).

- (C) Within sixty (60) days of receipt of a complaint, the Board of Ethics shall conduct an investigatory review to determine whether specific substantiated evidence from a credible source(s) exists to support a reasonable belief that there has been a violation of this Ordinance. If after reviewing the complaint the Board of Ethics by vote determines that no specific, substantiated evidence from a credible source(s) exists to support a reasonable belief that there has been a violation of this Ordinance or determines that no violation occurred, it may dismiss the complaint without further proceedings. In the event a complaint is dismissed based upon the merits of the complaint, the complaint may not be re-filed.
- (D) If the Board of Ethics determines that specific, substantiated evidence from a credible sources(s) exists to support a reasonable belief that there has been a violation of this Ordinance, certified written notice of a hearing, containing the time, date and place of such hearing, shall be given to each party by the Board of Ethics and a formal public hearing shall be conducted and both parties afforded an opportunity to be heard. Any formal public hearing shall be conducted in accordance with the requirements of due process. The Board of Ethics is authorized to swear witnesses.
- (E) Any final determination resulting from the hearing shall include written findings of fact and conclusions of law. The Board of Ethics shall determine if clear and convincing evidence shows any violation of this Ordinance.
- (F) Nothing in this section shall be considered to limit or encumber the right of the Board of Ethics to initiate an investigation on its own cognizance as it deems

Necessary to fulfill its obligations under this Ordinance.

Section Fifteen. Disciplinary Action.

- (A) Upon a determination that an employee has violated this Ordinance, the Board of Ethics may recommend the following penalties and actions:
 - (1) Written warning or reprimand;
 - (2) Suspension without pay;
 - (3) Termination of employment; and
 - (4) Repayment to the County of any unjust enrichment.

- (B) Upon a determination that a County Official has violated this Ordinance, the Board of Ethics may recommend the following penalties and actions:
 - (1) Written warning, censure or reprimand;
 - (2) Removal from office to the extent provided by Georgia law; and
 - (3) Repayment to the County of any unjust enrichment.

- (C) Upon direction of the Board of Ethics, a petition may be filed for injunctive relief, or any other appropriate relief, in the county superior court or in any other court having proper venue and jurisdiction, for the purpose of requiring compliance with the provisions of this Ordinance. In addition, the court may issue an order to cease and desist from the violation of the Ordinance. The court also may void an official action that is the subject of the violation, provided that the legal action to void the matter was brought within ninety (90) days of the occurrence of the official action, if the court deems voiding the action to be in the best interest of the public. The Court, after hearing and considering all the circumstances in the case, may grant all or part of the relief sought. However, the court may not void any official action appropriating public funds, levying taxes or providing for the

issuance of bonds, notes or other evidence of public obligation under this Ordinance.

- (D) In addition to any other remedy provided herein, upon determination of a Violation of this Ordinance, the Board of Ethics may recommend to the Board of Commissioners in writing that any contract, bid or change order that was the Subject of the violation should be cancelled or rescinded. The Board of Commissioners, however, shall retain the discretion to determine whether such a Cancellation or rescission would be in the best interest of the County and shall not be bound in any way by a recommendation of the Board of Ethics.
- (E) The Ethics Board may also forward its findings of fact and conclusions of law to the Barrow County District Attorney's Office and/or the Office of the Governor for appropriate action.

Section Sixteen. Judicial review.

- (A) Any party against whom a decision of the Board of Ethics is rendered may obtain judicial review of the decision by writ of certiorari to the superior court of the County. The application for the writ must be filed within thirty (30) days from the date of the written decision. Judicial review shall be based upon the record. No party shall be entitled to a de novo appeal.
- (B) Upon failure to timely request judicial review of the decision by writ of certiorari as provided in this section, the decision shall be binding and final upon all parties.
- (C) The appellate rights afforded hereunder shall be in lieu of any right to appeal an adverse employment action under the Barrow County Civil Service

System, to the extent the County Official or employee may be subject to the Civil Service System.

ARTICLE SIX: MISCELLANEOUS

Section One. Severability.

If any provision of this Ordinance is found by a court of competent jurisdiction to be invalid or unconstitutional, or if the application of this Ordinance to any person or circumstances is found to be invalid or unconstitutional, such invalidity or unconstitutionality shall not affect other provisions or applications of this Ordinance which can be given effect without the invalid or unconstitutional provision or application.

Section Two. Repealer

All laws, resolution, or ordinances or parts thereof that conflict with the provisions of this Ordinance are repealed.

Section Three. Effective Date.

The effective date of this Ordinance shall be July 1, 2004.

AMENDED:

Article Five, Section 1, Subparagraph (A) January 25, 2005

Article Five, Section 6, Subparagraph (C) January 8, 2008