SOUTH BRYAN COUNTY SEWER FLOW DIVERSION TO RICHMOND HILL

PREPARED FOR:

BRYAN COUNTY BOARD OF COMMISSIONERS

T&H PROJECT NO.

J-27691.0057

ADDENDUM NO. 3 **NOVEMBER 22, 2022**

PART I – GENERAL:

This Addendum has been issued on behalf of Bryan County Board of Commissioners. The following information should be considered by prospective bidders in preparation of their proposals and are hereby incorporated into the Proposal Documents. Bidders shall be responsible for acknowledging receipt of this addendum in the Bid Form, Document 00313. Failure to do so will result in the proposal being considered non-responsive.

PART II – QUESTIONS AND CLARIFICATIONS:

QUESTIONS:

1. Question: Will there be interior coating of the meter vault?
   Answer: Bituminous coating has been specified in the revised plan sheet and in revised Specification Section 02731 – Wastewater Collection System.

PART III – CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS:

1. **Section 00313 – BID FORM** has been revised. Delete and replace with the attached **Section 00313 – "Bid Form".** New Section 00313 includes allowances for SCADA and pump upgrades for select stations, Addendum 1, 2, and 3 dates, and shall be marked as "Revised per Addendum No. 3 – November 22, 2022".

   a. Bidder must use the enclosed form. **NO OTHER FORM SHALL BE ACCEPTED.**

2. **Section 02731 – Wastewater Collection System** has been revised. Delete and replace with the attached **Section 02731 – Wastewater Collection System**.

PART IV – DRAWINGS:

SHEET REVISION C2.2

Revised Sheet C2.2 is attached to this Addendum. Note 15 under the "General Notes" text has been added to specify interior coating for the wet-well.

All other aspects of the project remain unchanged.

THOMAS & HUTTON

Sam Dodd, P.E.
Project Manager

End of ADDENDUM NO. 3

DOCUMENT 00313

BID FORM
REVISED PER ADDENDUM #3

PROJECT IDENTIFICATION:	**SOUTH BRYAN COUNTY SEWER FLOW DIVERSION TO RICHMOND HILL**
CONTRACT IDENTIFICATION AND NUMBER:	**J – 27691.0057**
THIS BID IS SUBMITTED TO:	**BRYAN COUNTY BOARD OF COMMISSIONERS**

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Bid Price and within the Bid Times indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. BIDDER accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. **This Bid will remain subject to acceptance for 60 days** after the day of Bid opening, or for such longer period of time that BIDDER may agree to in writing upon request of OWNER.

3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

   (a) BIDDER has examined and carefully studied the Plans and Specifications for the work and contractual documents relative thereto, and has read all Technical Provisions, Supplementary Conditions, and General Conditions, furnished prior to the opening of Bids; that BIDDER has satisfied himself relative to the work to be performed.

   (b) BIDDER further acknowledges hereby receipt of the following Addenda:

ADDENDUM NO.	DATE
1	11/18/2022
2	11/21/2022
3	11/22/2022

   (c) BIDDER has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance, and furnishing of the Work;

   (d) BIDDER is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, performance, and furnishing of the Work.

   (e) BIDDER has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or

relating to existing surface or subsurface structure at or contiguous to the site (except underground Facilities) have been identified in the Supplementary Conditions. BIDDER acknowledges that such reports and drawings are not Contract Documents and may not be complete for BIDDER's purposes. BIDDER acknowledges that OWNER and Engineer do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site. BIDDER has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost progress, performance or furnishing of the work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto. BIDDER does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Bidding Documents.

(f) BIDDER is aware of the general nature of Work to be performed by Owner and others at the site that relates to Work for which this Bid is submitted as indicated in the Bidding Documents.

(g) BIDDER has correlated the information known to BIDDER, information and observations obtained from visits to the site, reports and drawings identified in the Bidding Documents and all additional examinations, investigations, explorations, tests, studies and data with the Bidding Documents.

(h) BIDDER has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that BIDDER has discovered in the Bidding Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.

(i) This bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false Bidder agrees to provide price for the Alternative Bid Items listed in the "Bid Form" as a part of the overall work. The Owner reserves the right to decide to either proceed or not proceed with the Alternative prior to the Contract Execution.

4. BIDDER will complete the Work in accordance with the Contract Documents for the following price(s):

SOUTH BRYAN COUNTY SEWER FLOW DIVERSION TO RICHMOND HILL BID FORM – ADDENDUM #3					
MOBILIZATION, CLEARING, GRASSING, EROSION CONTROL, AND TRAFFIC CONTROL					
Item	Description	QTY	Units	Unit Price	Total
1	Mobilization	1	LS		
2	Clearing	10.3	AC		
3	Grassing	10.3	AC		
4	Erosion, Sedimentation, and Pollution Control	1	LS		
5	Traffic Control	1	LS		
Sub-Total: MOBILIZATION, CLEARING, GRASSING, EROSION CONTROL, AND TRAFFIC CONTROL					
REGIONAL SEWER					
6	Meter Station - Complete	1	LS		
7	Jack & Bore 10" Steel Casing (0.375" Wall Thickness)	86	LF		
8	Jack & Bore 6" FPVC (AWWA C900, DR18) Force Main within Steel Casing	86	LF		
9	Jack & Bore 20" Steel Casing (0.375" Wall Thickness)	256	LF		
10	Jack & Bore 12" FPVC (AWWA C900, DR18) Force Main within Steel Casing	256	LF		
11	Horizontal Directional Drill 12" Dia. FPVC (AWWA C900, DR18) Force Main	1,024	LF		
12	4" Dia. PVC (AWWA C900, DR18) Force Main	6	LF		
13	6" Dia. PVC (AWWA C900, DR 18) Force Main	86	LF		
14	10" Dia. PVC (AWWA C900, DR18) Force Main	163	LF		
15	12" Dia PVC (AWWA C900, DR18) Force Main	11,676	LF		
16	12" Dia DIP (C151, PC350) Force Main	45	LF		
17	Connect Proposed 6" Dia. Force Main to Manhole	1	EA		
18	Connect Proposed 10" Dia. Force Main to Manhole	1	EA		
19	Connect Proposed 12" Dia. Force Main to Manhole	1	EA		
20	Connect Proposed 4" Dia. Force Main to 4" Dia. Force Main	1	EA		
21	Connect Proposed 10" Dia. Force Main to 10" Dia. Force Main	3	EA		
22	Connect Proposed 12" Dia. Force Main to 12" Dia. Force Main	1	EA		
23	2" Combination Air/Vacuum Release Valve In Pedestal Assembly	9	EA		
24	4" Plug Valve in Manhole	1	EA		
25	6" Plug Valve in Manhole	1	EA		
26	10" Plug Valve in Manhole	6	EA		

27	12" Plug Valve in Manhole	11	EA		
28	4" x 4" Tee D.I.R.J.	1	EA		
29	4" x 6" Reducer D.I.R.J.	1	EA		
30	6" 45° Bend D.I.R.J.	2	EA		
31	10" 45° Bend D.I.R.J.	2	EA		
32	10" x 10" Wye D.I.R.J.	3	EA		
33	10" x 12" Reducer D.I.R.J.	2	EA		
34	12" 11.25° Bend D.I.R.J.	12	EA		
35	12" 22.5° Bend D.I.R.J.	5	EA		
36	12" 45° Bend D.I.R.J.	18	EA		
37	12" x 12" Tee D.I.R.J.	1	EA		
38	Septic Tank/ Dosing Pumps and Structures Removal and Disposal	LUMP SUM	LS		
39	Remove and Replace Dirt Road	1,531	SY		
40	Remove and Replace Asphalt Pavement	260	SY		
41	Stone Bedding [1]	200	CY		
42	Sand Backfill [1]	200	CY		
				Sub-Total: REGIONAL SEWER	
PUMP STATION UPGRADES					
43	Pump Station Upgrade - Bowridge Pump Station [2]	JOB	ALLOWANCE	$ 150,000.00	$ 150,000.00
44	Pump Station SCADA Installation / Electrical Upgrades - Veterans Pkwy Pump Station [3]	JOB	ALLOWANCE	$ 50,000.00	$ 50,000.00
45	Pump Station SCADA Installation / Electrical Upgrades - Wexford Plantation Pump Station [3]	JOB	ALLOWANCE	$ 50,000.00	$ 50,000.00
46	Pump Station SCADA Installation / Electrical Upgrades - Wicklow Pump Station [3]	JOB	ALLOWANCE	$ 50,000.00	$ 50,000.00
47	Pump Station SCADA Installation / Electrical Upgrades - Magnolia Hill Pump Station [3]	JOB	ALLOWANCE	$ 50,000.00	$ 50,000.00
48	Pump Station SCADA Installation / Electrical Upgrades - Watergrass Pump Station [3]	JOB	ALLOWANCE	$ 50,000.00	$ 50,000.00
				Sub-Total: PUMP STATION UPGRADES	$ 400,000.00
				TOTAL BASE BID:	
				TOTAL BID AMOUNT:	

[1] *These items are of an indeterminate quantity and are presented only to establish a unit price. These items may or may not be utilized in construction of the project. No payment will be made for these items without written authorization from Owner or Engineer.*

[2] *Contractor shall assist in the evaluation of the Pump Station Upgrade for Bowridge Pump Station, up to and including impeller changes, remove and replace pumps, remove, and replace base elbows/guide rails, electrical/control system upgrades, furnish and install SCADA, and miscellaneous interior wet-well reconfigurations.*

[3] *Allowances for Pump Station SCADA Installation / Electrical Upgrades shall include upgrading electrical breakers and installation of SCADA control/telemetry systems per Bryan County's standards.*

TOTAL BID FOR ALL ESTIMATED PRICES:

SOUTH BRYAN COUNTY SEWER FLOW DIVERSION TO RICHMOND HILL

TOTAL BID AMOUNT:

($)

Unit Prices have been computed in accordance with Article 13 of the General Conditions.

BIDDER acknowledges that estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities determined as provided, determined as provided in the Contract Documents.

5. BIDDER agrees that the Work will be substantially complete within 270 calendar days after the date when the Contract Times commence to run as provided in paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with paragraph 15.06 of the General Conditions within 300 calendar days after the date when the Contract Times commence to run.

6. BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified in the Agreement.

7. The following documents are attached to and made a condition of this Bid:

   (a) Required Bid Security in the form of 5% of the Bid Total Price.

8. The undersigned further agrees that in case of failure on his part to execute the said contract and the Bond within fifteen (15) consecutive calendar days after written notice being given of the award of the contract, the check or bid bond accompanying this bid, and the monies payable thereon shall be paid into the funds of the Owner as liquidated damages for such failure, otherwise, the check or bid bond accompanying this proposal shall be returned to the undersigned.

9. Communications concerning this Bid shall be addressed to:

Thomas & Hutton Engineering Co.
50 Park of Commerce Way
Savannah, GA 31402
Attn: Trent V. Thompson, P.E.
thompson.t@tandh.com

10. Terms used in this Bid which are defined in the General Conditions or Instructions will have the meanings indicated in the General Conditions of Instructions.

SUBMITTED on _____, 20__.

_____

ADDRESS:

_____

_____

BY:_____

_____

State Utility Contractor License No. _____

INDEX TO

SECTION 02731 – WASTEWATER COLLECTION SYSTEM

Paragraph	Title	Page

PART 3 – EXECUTION

SECTION 02731

WASTEWATER COLLECTION SYSTEM

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Sewer Pipes.

B. Manholes.

C. Connect to existing system.

D. All necessary appurtenances to collect the wastewater and deliver it to the existing system.

E. Force Main

1.2 RELATED SECTIONS

A. Section 02204 – Earthwork.

B. Section 02667 – Water Distribution System.

1.3 OPTIONS

A. The specifications describe several materials. Where manufacturers and models of equipment are named in the specifications, it is intended these are to describe quality and function required. Contractor may use equipment or materials of other manufacturers provided they are reviewed and accepted by the Engineer and Owner as equivalent to those specified.

1.4 REFERENCES (Latest Revision)

A. ASTM A 139 – Electric–Fusion (Arc) Welded Steel Pipe (NPS 4 and Over).

B. ASTM A 377 – Index of Specifications for Ductile Iron Pressure Pipe.

C. ASTM A 615/A 615 M – Deformed and Plain Carbon – Steel Bars for Concrete Reinforcement.

D. ASTM A 746 – Ductile Iron Gravity Sewer Pipe.

E. ASTM C 39/C 39M – Compressive Strength of Cylindrical Concrete Specimens.

F. ASTM C 443 – Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.

G. ASTM C 478 – Circular Precast Reinforced Concrete Manhole Sections.

H. ASTM C 890 – Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.

I. ASTM C 891 – Installation of Underground Precast Concrete Utility Structures.

J. ASTM C 913 – Precast Concrete Water and Wastewater Structures.

K. ASTM D 714 – Evaluating Degree of Blistering of Paints.

L. ASTM D–1557 – Laboratory Compaction Characteristics of Soil Using Modified Effort.

M. ASTM D 2241 – Poly (Vinyl Chloride) (PVC) Pressure–Rated Pipe (SDR Series).

N. ASTM D 2321 – Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity–Flow Applications.

O. ASTM D 2774 – Underground Installation of Thermoplastic Pressure Piping.

P. ASTM D 2794 – Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

Q. ASTM D 3034 – Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

R. ASTM D 3139 – Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

S. ASTM D 3212 – Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

T. ASTM D 3740 – Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

U. ASTM D–6938 – In–Place Density and Water Content of Soil and Soil–Aggregate by Nuclear Methods (Shallow Depth).

V. ASTM E 96 – Water Vapor Transmission of Materials.

W. ASTM E 329 – Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

X. ASTM F 477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

Y. ASTM F 1417 – Installation Acceptance of Plastic Non–Pressure Sewer Lines Using Low–Pressure Air.

Z. ASTM G 154 – Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for UV Exposure of Nonmetallic Materials.

AA. AWWA C 110 – Ductile–Iron and Gray–Iron Fittings

BB. AWWA C 111 – Rubber–Gasket Joints for Ductile Iron Pressure Pipe and Fittings.

CC. AWWA C115 – Flanged Ductile Iron Pipe with Ductile Iron or Gray Iron Threaded Flanges.

DD. AWWA C 150 – Thickness Design of Ductile Iron Pipe.

EE. AWWA C 151 – Ductile Iron Pipe, Centrifugally Cast, for Water.
FF. AWWA C 153 – Ductile–Iron Compact Fittings

GG. AWWA C–500 – Metal–Seated Gate Valves for Water Supply Service.

HH. AWWA C–509 – Resilient–Seated Gate Valves for Water Supply Service.

II. AWWA C 600 – Installation of Ductile Iron Water Mains and their appurtenances.

JJ. AWWA C900 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 Inches through 60 inches, for Water Transmission and Distribution.

KK. ACI 318 – Building Code Requirements for Structural Concrete.

1.5 MEASUREMENT AND PAYMENT

A. Measurement – Items listed in the proposal shall be considered as sufficient to complete work in accordance with plans and specifications. Any portion of work not listed in the bid form shall be deemed to be a part of item it is associated with and shall be included in costs of unit shown on bid form. Payment for unit shown on the bid form shall be considered satisfactory to cover cost of all labor, material, equipment, and performance of all operations necessary to complete work in place. The unit of measurement shall be unit shown on bid form. Payment shall be based upon the actual quantity multiplied by unit prices. Where work is to be performed at a lump sum price, the lump sum shall include all operations and elements necessary to complete work.

B. Payment

1. Sewer Metering Station – Payment will be made at the contract lump sum price for "Meter Station – Complete" and as shown on the drawings. The payment will include cost of dewatering, excavation, precast structure, meter, fittings, restraints, aluminum access hatch assembly, sump pump system, sump discharge piping and connection to existing wetwell, electrical, coatings, and any necessary adapters to connect to pipe. Payment will also include removal and disposal of unsuitable material, installation of geotextile, bedding, backfilling with select suitable material, compaction, testing, material, labor, accessories, and incidentals required to make the installation. Satisfactory tests must be completed before payment is made.

2. Force Mains – Shall be paid for at the contract unit price per linear foot installed for the various pipe sizes and pipe materials. Payment will include the pipe, polyethylene tube encasement, excavation, removal and disposal of unsuitable material, installation, geotextile, bedding, electronic ball markers, backfilling with select unsuitable material, compaction, testing, tracing wire, and warning tape. Satisfactory tests must be completed before payment it made.

3. Trench Wall Supports – No separate payment will be made for bracing and sheeting.

4. D.I.R.J. Fittings – Payment for ductile iron restrained joint fittings for ductile iron and plastic pipe will be paid for on the basis of the unit price per each ductile iron fitting installed. Fittings shall be AWWA Specification C–153 for mechanical joint compact fittings. Payment includes furnishing and installing the fittings, gaskets, necessary adapters to connect to valves, joint restraints, and all other appurtenances necessary to install fittings on the force main.

5. Stone Bedding – No separate measurement or payment will be made for stone bedding. The cost of stone bedding shall be included in the overall cost of the pipe. The force main shall be bedded as shown in the details. The Contractor shall notify the Engineer in writing if additional stone is required beyond that shown in the detail, including the locations requiring additional bedding and estimated quantities of materials. No payment for additional bedding shall be made without approval from Owner and Engineer.

6. Sand Backfill– No separate measurement or payment will be made for sand backfill. The cost for sand backfills and geotextile shall be included in the overall cost of the pipe. The force man shall be backfilled as shown in the details. The Contractor shall notify the Engineer in writing if additional backfill is required beyond that shown in the details and estimated quantities of material. No payment for additional backfill shall be made without approval from Owner and Engineer.

7. Service Connection – Payment will be made at the contract unit price. Payment shall include the fitting, plug, and marking stake.

8. Metal Detector Tape – No separate payment will be made for tape. Cost of furnishing and placing metal detector tape shall be included in the contract unit price for installing force main pipe.

Note: Wire on all pipes shall be required in Georgia after January 1, 2001.

9. Tracer Wire – No separate payment will be made for wire. The cost of furnishing and placing tracer wire shall be included in the contract unit price for installing force main pipe.

10. Combination Air/Vacuum Release Valve in Pedestal Assembly– Payment will be made at the contract unit price and will include furnishing and installing the air/vacuum release valve assembly, pedestal assembly, plug valve, piping, tee, tapping saddle/ sleeve, backfilling, compacting, and clean–up.

11. Plug Valve in Manhole – Payment will be made at the contract unit price for each size. Payment will include furnishing and installing the valve, manhole structure, frames, covers, pipe supports, backfilling, compacting, grassing, clean up and all other incidentals to complete the job.

12. Remove and Replace Asphalt Pavement – Payment will be made at the contract unit price per square yard. Payment will include all labor, materials, equipment, and incidentals necessary to remove existing base and asphalt paving, disposal of removed materials in an appropriate

disposal site, backfilling, grading, compaction of base, installation of binder/surface courses and tack coat in accordance with plans, details, and specification. Payment shall also include testing, traffic marking/striping, and all incidentals to complete the roadway paving.

13. Remove and Replace Dirt Road – Payment will be made at the contract unit price per square yard. Payment will include all labor, materials, equipment, and incidentals necessary to remove existing earthen drive in order to install proposed force main and restore the driveway to pre–construction conditions or better as per detail shown in the construction plans.

14. Connect Force Main to Existing Manhole – Payment will be made at the contract unit price for each pipe size connected. For precast structures payment shall include cost of dewatering, excavation, coring, furnishing and installing flexible sleeve, installing and connecting pipe to sleeve, backfilling, compaction, clean–up, and all work necessary to complete the connection. For brick structures, payment shall include cost of dewatering, excavation, cutting a hole, installing and grouting in pipe, backfilling, compaction, cleanup, and all work necessary to complete the connection.

15. Connect Force Main to Existing Force Main – Payment will be made at the contract unit price for each pipe size connected to various existing pipe sizes. Payment shall include cost of dewatering, excavation, connecting new force main to existing force main, backfilling, compaction, clean–up, and all work necessary to complete the connection.

16. Septic Tank / Dosing Pumps and Structures Removal and Disposal – Payment will be made at the contract lump sum price. Payment will include all labor, materials, equipment, dewatering, removal of electrical units, removal of pumps, removal of structures, and all incidentals necessary to remove the existing septic tank.

17. Pump Station Upgrade – Bowridge Pump Station – Payment will be made at the contract allowance price. Contractor shall assist in the evaluation of the Pump Station Upgrade for Bowridge Pump Station, up to and including impeller changes, remove and replace pumps, remove and replace base elbows/guide rails, electrical/control system upgrades, installation of new Remote Telemetry Unit (RTU), communication survey, SCADA controls, programming, integration, and all other labor, materials, and incidentals required to provide a fully functional SCADA system tied into the County's master SCADA system. Contractor shall utilize the County's selected SCADA System Integrator M/R Systems, LLC (Contact Sothorn Khel, P.E., 678–325–2824).

18. Pump Station SCADA Installation / Electrical Upgrades – Payment will be made at the contract allowance price. Allowances for Pump Station SCADA Installation / Electrical Upgrades shall include upgrading electrical breakers and installation of new Remote Telemetry Unit (RTU), communication survey, SCADA controls, programming, integration, and all other labor, materials, and incidentals required to provide a fully functional SCADA system tied into the County's master SCADA system. Contractor

shall utilize the County's selected SCADA System Integrator M/R Systems, LLC (Contact Sothorn Khel, P.E., 678–325–2824).

1.6 QUALITY ASSURANCE

A. Contractor will furnish the Engineer and Owner a description of all material before ordering. Engineer will review the Contractor's submittals and provide in writing an acceptance or rejection of material.

B. Where ductile iron pipe is indicated on the plans, or required by Engineer, it shall be used.

C. Material and equipment shall be the standard products of a manufacturer who has manufactured them for a minimum of two years and provides published data on their quality and performance.

D. A subcontractor for any part of the work must have experience on similar work, and if required, furnish Engineer with a list of projects and Owners or Engineers who are familiar with its competence.

E. If Contractor wishes to furnish devices, equipment, structures, and systems not designed by Engineer, these items shall be designed by either a Professional Engineer registered in the project state or by someone Engineer accepts as qualified. If required, complete design calculations and assumptions shall be furnished to the Engineer or Owner before acceptance.

F. Testing shall be by a testing laboratory which operates in accordance to ASTM D 3740 or E 329 and shall be acceptable to Engineer prior to engagement. Mill certificates of tests on materials made by manufacturers will be accepted provided the manufacturer maintains an adequate testing laboratory, makes regularly scheduled tests, spot checked by an outside laboratory, and furnishes satisfactory certificates with name of entity making test.

G. Infiltration, line and grade of sewer, pump performance, and hydrostatic tests on force mains shall be made by Contractor with equipment qualified by Engineer and in the presence of Engineer. Engineer or Project Representative reserves the right to accept or reject testing equipment.

1.7 PRODUCT DELIVERY, STORAGE & HANDLING

A. Material shall be unloaded in a manner avoiding damage and shall be stored where it will be protected and will not be hazardous to traffic. If stored on private property, Contractor shall obtain permission from property owner and shall repair any damage caused by the storage. Material shall be examined before installation. Neither damaged nor deteriorated material shall be used in the work.

1.8 JOB CONDITIONS

A. Installation of the wastewater collection system must be coordinated with other work on site. Generally, wastewater pipes will be installed first and shall be backfilled and protected so subsequent excavating and backfilling of other utilities does not disturb them. Contractor shall replace or repair any damaged pipe or structure at no additional expense to the Owner.

1.9 SEQUENCING AND SCHEDULING

A. Contractor shall arrange the work so sections of sewers between manholes are backfilled and tested, lateral sewers connected, pavement replaced, and placed in service as soon as reasonable after installation.

1.10 ALTERNATIVES

A. The intention of these specifications is to produce the best system for the Owner. If the Contractor suggests alternate material, equipment or procedures will improve results at no additional cost, Engineer and Owner will examine suggestion, and if accepted, it may be used. The basis upon which acceptance of an alternate will be given is its value to Owner, and not for Contractor's convenience.

1.11 GUARANTEE

A. Contractor shall guarantee quality of materials, equipment, and workmanship for 12 months after acceptance of the completed Project. Defects discovered during this period shall be repaired by Contractor at no cost to the Owner.

1.12 EXISTING UTILITIES

A. All known utility facilities are shown schematically on the construction drawings, and are not necessarily accurate in location as to plan or elevation. Utilities such as service lines or unknown facilities not shown will not relieve the Contractor of responsibility under this requirement. "Existing Utilities Facilities" means any utility existing on the project in its original, relocated, or newly installed position. Contractor will be held responsible for cost of repairs to damaged underground facilities, even when such facilities are not shown on the drawings.

B. The Contractor shall call for underground utility locations before starting work. Underground utilities location service can be contacted at 1–800–282–7411 (GA) or 811.

1.13 TESTING

A. Laboratory tests for moisture density relationship for fill materials shall be in accordance with ASTM D 1557, (Modified Proctor).

B. In place density tests in accordance with ASTM D 2922.

C. Testing laboratory shall operate in accordance with ASTM D 3740 and E 329 and be acceptable to the Engineer.

D. Testing laboratory and Project Engineer/Project Representative shall be given a minimum of 48–hours' notice prior to taking any tests.

E. Testing shall be Contractor's responsibility and shall be performed at the Contractor's expense by a commercial testing laboratory operating in accordance with subparagraph C above.

F. Test results shall be furnished to the Engineer prior to continuing with associated or subsequent work.

PART 2 – PRODUCTS

Materials used in the work shall be those named in Bid Form. In multiple type bids, selection of material types will be at the opinion of Owner. Materials and products used shall conform to one of the following:

2.1 SEWER PIPE

A. PVC Pipe (4"–15" Gravity Sewer) – Shall be polyvinyl chloride plastic (PVC) and shall meet all requirements of ASTM D 3034 SDR 26, except for depths less than 3 feet where ductile iron pipe must be installed. All pipe shall be suitable for use as a gravity sewer conduit. Provisions must be made for contraction and expansion at each joint with a rubber gasket. Pipe sizes and dimensions shall be as shown below. All pipe shall be green or white in color with factory marked homing lines. Fittings shall meet the same specification requirements as pipe.

Nom. Size	Outside Diameter		Min. Wall Thickness SDR–26
	Average	Tolerance	
4	4.215	± 0.009	.162
6	6.275	± 0.011	.241
8	8.400	± 0.012	.323
10	10.500	± 0.015	.404
12	12.500	± 0.018	.481

Tests on PVC Pipe – Pipe shall be designed to pass all tests at 73 ° F. (± 3° F.).

B. PVC Pipe (16" – 64" Gravity Sewer) – Shall be polyvinyl chloride plastic (PVC) and shall meet all requirements of AWWA C900 with a minimum DR of 18, except for depths less than 3 feet where ductile iron pipe must be installed. All pipe shall be suitable for use as a gravity sewer conduit. Provisions must be made for contraction and expansion at each joint with a rubber gasket. Pipe sizes and dimensions shall conform to AWWA C900. All pipe shall be green or white in color with factory marked homing lines. Fittings shall meet the same specification requirements as pipe.

Tests on PVC Pipe – Pipe shall be designed to pass all tests at 73 ° F. (± 3° F.).

B. Ductile Iron – Shall conform to AWWA C 150, AWWA C 151 and ASTM A 746. All pipe shall be Pressure Class 350 unless otherwise noted. All ductile iron pipes and fittings shall be bituminous coated on the outside and lined with Protecto 401 Ceramic Epoxy or equivalent on inside.

1. Coating on the outside shall be an asphaltic coating approximately 1 mil thick. Finished coating shall be continuous, smooth, neither brittle when cold or sticky when exposed to sun, and shall be strongly adherent to the iron. All ductile iron fittings shall be bituminous coated on the outside and lined with Protecto 401 Ceramic Epoxy or equivalent on inside.

Coating on the outside shall be an asphaltic coating approximately 1 mil thick. Finished coating shall be continuous, smooth, neither brittle when cold or sticky when exposed to sun, and shall be strongly adherent to the iron.

Protecto 401 Ceramic Epoxy or equivalent interior lining shall conform to ASTM E 96, ASTM D 714, ASTM D 2794, and ASTM G 53. Interior of the fitting shall receive 40 mils nominal dry film thickness of epoxy. Lining application, inspection, certification, handling, and surface preparation of area to receive the protective coating shall be in accordance with manufacturer's specifications and requirements.

2. Protecto 401 Ceramic Epoxy or equivalent interior lining shall conform to ASTM E 96, ASTM D 714, ASTM D 2794, and ASTM G 53. Interior of the pipe shall receive 40 mils nominal dry film thickness of epoxy. Lining application, inspection, certification, handling, and surface preparation of area to receive the protective coating shall be in accordance with manufacturer's specifications and requirements.

2.2 JOINTS – GRAVITY SYSTEM

A. Joints for Ductile Iron Pipe – Shall be slip–on rubber equivalent to "Fastite," "All–tite," or "Tyton."

B. Joints for PVC Pipe – Shall be integral wall bell and spigot with a rubber ring gasket. Joints shall conform to ASTM D 3212 and gaskets to ASTM F 477.

2.3 FORCE MAIN

A. P.V.C. – All pipe shall be green in color with factory marked homing lines. Pipe with diameter less than 4 inches shall conform to all requirements of ASTM D 2241, SDR 26, Class 160. Pipe 4 inches through 18 inches shall conform to all requirements of AWWA C900 with CI outside diameter, minimum DR of 18, Pressure Class of 235 p.s.i. Joints shall be in accordance with ASTM D 3139.

B. Ductile Iron pipe shall be in accordance with Paragraph 2.1–B and conform to ASTM A 377. Push–on–Joints shall be slip–on rubber equivalent to "Fastite," "All–tite," or "Tyton." Flanged joints shall conform to AWWA C 115. Gaskets shall conform to AWWA C 111.

C. Thrust blocking shall be sized as detailed on the construction drawings of 3,000 p.s.i. concrete. Blocking shall be provided at all bends deflecting 11–1/4° degrees or more and bear directly against the undisturbed trench wall.

D. Restrained Joints – Restrained joints for pipe, valves and fittings shall be mechanical joints with ductile iron retainer glands equivalent to "Megalug" or push–on type joints equivalent to "Lok–Ring," "TR Flex," or "Super Lock" and shall have a minimum rated working pressure equal to the item restrained with a minimum safety factor of 2:1. Joints shall be in accordance with the applicable portions of AWWA C–111. Manufacturer of joints shall furnish certification, witnessed by an independent

laboratory, stating joints furnished have been tested without signs of leakage or failure. Restrained joints shall be capable of being deflected after assembly.

E. Fittings:

1. Fittings for Ductile Iron or Plastic Pipe – Shall be ductile iron, manufactured in accordance with AWWA C–153. They shall be cement lined in accordance with AWWA C–104. Fittings shall be designed to accommodate the type of pipe used.

2. Fittings for Flanged Pipe – Shall be manufactured in accordance with AWWA C–110, Class 125 flanges.

3. Fittings for Plastic Pipe – Less than 4 inches shall be PVC with ring tite rubber joints conforming to ASTM D–3139.

2.4 CASING

A. Casing pipe shall be steel conforming to ASTM A 139, yield point of 35,000 p.s.i., of the diameter shown on drawings at each crossing. The minimum wall thickness shall be 0.25 inches.

2.5 CASING SPACERS

A. Casing spacers shall be bolt on style with a shell made in two sections of a minimum 14 gauge T–304 Stainless Steel. Connecting flanges shall be ribbed for extra strength. The shell shall be lined with a PVC liner. All nuts and bolts shall be T–304 Stainless Steel. Runners shall be made of Ultra High Molecular Weight Polymer with inherently high abrasion resistance and a low coefficient of friction. The combined height of supports and runners shall keep carrier pipe a minimum of 0.75–inches from casing pipe at all times. Casing Spacers shall be as manufactured by Cascade Waterworks Manufacturing Company, or accepted equivalent.

2.6 MANHOLES

A. Masonry – Shall be new whole brick of good quality laid in masonry mortar or cement mortar made of one part Portland cement and two parts clean sharp sand. Every brick shall be fully bedded in mortar. Manholes shall conform to locations and details shown on the plans.

B. Precast Concrete – Shall be reinforced concrete constructed in accordance with ASTM C 478 and details shown on the plans "Precast Concrete Manholes." Coarse aggregate shall be granite stone. The joints shall be tongue and groove sealed with flexible gaskets or mastic sealant. Gaskets shall be O–Ring or equivalent to Type A or B "Tylox" conforming to ASTM C 443. Mastic shall be equivalent to "Ram–nek" with primer. Primer shall be applied to all contact surfaces of manhole joint at the factory in accordance with manufacturer's instructions.

C. Frames and Covers – Shall be cast iron equivalent to the following:

Neenah Foundry Co. R–1668 Type "C" Lid

D. Manhole Steps – Shall be equivalent to M.A. Industries, Type PS–1 or PS–2–PF. Steps shall be installed at the manhole factory and in accordance with

recommendations of step manufacturer. Manholes will not be acceptable if steps are not installed accordingly.

E. Pipe Connections – Shall have flexible watertight joints at sewer main point of entry into the manhole. The joint shall be an EPDM or polyisoprene sleeve equivalent to "Kor–N–Seal."

F. Coatings – New manholes shall have all interior surfaces coated with 2 coats of bituminous coating, per Bryan County's details.

New or existing manholes requiring a force main tie–in and the next downstream manhole shall be coated with 125 wet film mils of Raven 405 ultra–high build epoxy or an accepted equivalent. The interior surfaces shall be cleaned and prepared according to manufacturer's recommendations.

2.7 TEES AND WYES

A. Gravity sewer tees and wyes shall be four or six inches and same diameter as the run of pipe. They shall be of same material as the sewer main.

B. Wyes for cleanouts shall be of same material as the lateral pipe.

2.8 LATERALS AND CLEANOUTS

A. Shall be Ductile Iron Pipe conforming to paragraph 2.1–B, with push–on joints or Polyvinyl Chloride pipe with bells and rubber gaskets for jointing, conforming, to Paragraph 2.1–A, PVC Pipe.

B. Cleanout Access Box shall be equivalent to U.S. Foundry USF 7623 in pavement or Genova Products 4–inch Schedule 40 PVC–DWV Cleanout Fitting with threaded plug out of pavement.

2.9 STONE BEDDING

A. Shall be graded crushed granite with the following gradation:

Square Opening Size	Percent Passing
1 inch	100%
3/4 inch	90 to 100%
3/8 inch	0 to 65%
No. 4	0 to 25%

2.10 SAND BACKFILL

A. Shall be clean sand free from clay and organic material. Not more than 10% shall pass the No. 100 sieve.

2.11 BORROW

A. Where it is determined sufficient suitable material is not available from the site to satisfactorily backfill pipe to at least two feet above top of pipe, Contractor shall furnish suitable sandy borrow material to accomplish requirements. Material shall not have more than 10% passing the No. 100 sieve, nor more than 20% passing a No. 200 sieve.

2.12 AIR RELEASE VALVE

A. Shall be designed for sewage service. The valve shall be constructed of a cast iron body, stainless steel or bronze trim, and stainless steel float. The inlet shall be 2 inches, 5/16 inch orifice, and a venting capacity of 35 c.f.f.a.m. The working pressure shall be 0 to 50 p.s.i. It shall conform to detail shown on the drawings.

B. Pedestal assembly shall be Channell Model Signature Series Pedestal Housing P/N SPH 1420, Green Color, with anti–insect vents. Included with the assembly shall be interior s.s. post with s.s. hardware and s.s. locking hasp with brass lock.

2.13 METAL DETECTOR TAPE

A. Will be installed above all pipe. Tape shall consist of 0.35 mils thick solid foil core encased in a protective plastic jacket resistant to alkalis, acids, and other destructive elements found in the soil. The lamination bond shall be strong enough so layers cannot be separated by hand. Total composite thickness shall be 5.0 mils. Foil core to be visible from unprinted side to ensure continuity. The tape shall have a minimum 3 inch width and a tensile strength of 35 lbs. per inch.

A continuous warning message indicating "sewer line" repeated every 16 inches to 36 inches shall be imprinted on the tape surface. Tape shall contain an opaque color concentrate designating color code appropriate to the line being buried (Sewer Line – Green).

Note: Wire on all pipes shall be required in Georgia after January 1, 2001.

2.14 TRACER WIRE

A. Will be used over all force main lines. Tracer wire shall be #12 AWG High–Strength Copper Clad Steel (HS–CCS) Conductor, insulated with 30 mil High Density Polyethylene (HDPE) Insulation, and rated for direct burial. Insulation color shall meet APWA color code standards for identification of buried utilities.

B. Wire connectors shall be designed for direct burial and moisture resistance. Connectors shall be equivalent to 3M DBR/Y–6 Direct Bury Splice Kit.

2.15 CHECK VALVES

A. Shall be designed for sewage service. The valve shall be cast iron and bronze fitted. The valve shall be a spring and lever type with neoprene seat and O–Ring seals on a stainless steel valve pin, for pipes 3 inches and larger in diameter. For check valves smaller than 3 inches, the valve shall be a fully ported 150 p.s.i. rated ball check valve with a corrosion resistant phenolic base and a rubber seat. Check

valve shall be of full waterway design for quiet operation and with a flow area through the valve equal to or exceeding flow area of pipe to which it is installed.

2.16 GATE VALVES

A. Two Inches and Larger – Shall be cast iron or ductile iron body, bronze mounted, double disc or resilient wedge design, with non–rising stems, conforming to AWWA C 500, C 509, or C 515. Valves shall have ends to match the pipe to which they are attached. Attachment to plastic pipe shall be made by special adapters. Valves shall have a working pressure of 200 p.s.i. and be tested at 400 p.s.i.

Valves shall be furnished with "O" ring packing. One "O" ring shall be located above the thrust collar and one below. Thrust collar shall be permanently lubricated and have an anti–friction washer on top of the thrust collar.

B. Smaller than 2 inches – Shall be all brass, ball valve type. The pressure rating shall be 175 p.s.i.

C. Valve Boxes – Underground valves shall be installed in acceptable valve boxes. Valve boxes shall have a suitable base that does not damage valve or pipe, and shaft extension sections to cover and protect the valve and permit easy access and operation. The box, cover, and extensions shall be cast or ductile iron having a crushing strength of 1,500 pounds per linear foot.

2.17 PLUG VALVES

A. Shall be fully ported and of the same diameter as pipes to which they are attached. They shall have semi–steel bodies, all metal plugs, stainless steel bearings, and be equivalent to DeZurik 100% port eccentric (PEF) valves, lever operated. All valves 6 inches and larger shall be equipped with gear actuator and 2" operating nut for below ground installation and gear actuator and handwheel for above ground installation.

2.18 PRODUCT REVIEW

A. Contractor shall provide the Engineer with a complete description of all products before ordering. Engineer will review all products before they are ordered by Contractor.

PART 3 – EXECUTION

3.1 CONSTRUCTION OBSERVATION

A. The line, grade, deflection, and infiltration of sewers and force mains shall be tested by Contractor under the direction of Engineer. Engineer or Project Representative will have the right to require any portion of work be completed in their presence. If work is covered up after such instruction, it shall be exposed by Contractor for observation. However, if Contractor notifies Engineer such work is scheduled and Engineer fails to appear within 48 hours, the Contractor may proceed. All work completed and materials furnished shall be subject to review by the Engineer or Project Representative. All improper work shall be reconstructed. All materials not conforming to requirements of specifications shall be removed from the work upon

notice being received from Engineer for rejection of such materials. Engineer shall have the right to mark rejected materials to distinguish them as such.

Contractor shall give the Project Engineer or Project Representative a minimum of 48 hours' notice for all required observations or tests.

It will also be required by Contractor to keep accurate, legible records of the location of all sanitary lines, service laterals, manholes, force mains, valves, bends, and appurtenances. These records will be prepared in accordance with "Record Data and Drawings" paragraph in the Special Conditions. Final payment to the Contractor will be withheld until all such information is received and accepted.

3.2 LOCATION AND GRADE

A. Line and grade of sewers and position of all manholes and other structures are shown on the drawings. Grade line as given on the profile or mentioned in these specifications means invert or inside bottom of pipe. Price for trenching shall include trench for depth below this line necessary to lay sewer to grade, but measurements for payment will be made only to grade line. Master control lines and bench marks have been provided by the Engineer. The Contractor shall be responsible for proper locations and grades of sewers.

3.3 SEWER EXCAVATION

A. Contractor shall perform all excavations of every description and of whatever substance encountered to the depth shown on the plans or specified for all sewers, manholes, and other appurtenances. All excavations shall be properly dewatered before installations are made, by the use of well points, pumping, or other methods accepted by Engineer. Trenches shall be excavated in conformance with the Occupational and Safety Health Administration's (OSHA) Regulations.

Where the character of soil is unsuitable for pipe bedding as determined by Engineer or Geotechnical Consultant, additional excavation will be authorized. Engineer or Geotechnical Consultant shall determine the depth needed for additional bedding and whether material will be sand or stone. The unsuitable material shall be disposed of at Contractor's expense in a proper manner. Bottom of all trenches shall be rounded to conform to the bottom of pipe, to afford full bearing on pipe barrel. Excavation in excess of depths and widths required for sewers, manholes, and other structures shall be corrected by pouring subfoundations of 3,000 p.s.i. concrete and half cradle at the Contractor's expense.

B. Trenches shall not be excavated more than 400 feet in advance of pipe laying.

3.4 TRENCH WALL SUPPORT

A. Bracing and Sheeting – The sides of all trenches shall be securely held by stay bracing, or by skeleton or solid sheeting and bracing, as required by soil conditions encountered, to protect adjoining property and for safety. Where shown on drawings or where directed by Engineer, the Contractor must install solid sheeting to protect adjacent property and utilities. Sheeting shall be steel or timber and Contractor shall submit design data, including the section modulus of members and arrangement for bracing at various depths, to Engineer for review before

installing sheeting. It shall penetrate at least 3–feet below the pipe invert. Contractor shall ensure support of pipe and its embedment is maintained throughout installation and ensure sheeting is sufficiently tight to prevent washing out of the trench wall from behind sheeting.

B. Sheeting Removal – Sheeting shall be removed in units and only when backfilling elevation has reached the level necessary to protect pipe, adjoining property, personnel, and utilities. Removal of sheeting or shoring shall be accomplished in a manner to preclude loss of foundation support and embedment materials. Fill voids left on removal of sheeting or shoring and compact all materials to required densities.

C. Movable Trench Wall Supports – Do not disturb installed pipe and its embedment when using movable trench boxes and shields. Movable supports should not be used below top of pipe zone unless acceptable methods are used for maintaining the integrity of embedment material. Before moving supports, place and compact embedment to sufficient depths to ensure protection of the pipe. As supports are moved, finish placing and compacting embedment.

D. When sheeting or shoring cannot be safely removed, it shall be left in place. Sheeting left in place shall be cut off at least 2 feet below the surface. No separate payment shall be made for bracing and sheeting except where shown on drawings or authorized by the Engineer.

3.5 LAYING PIPE

A. All sewer pipe shall be laid upgrade with spigots pointing downgrade and in accordance with ASTM D 2321. The pipe shall be laid in a ditch prepared in accordance with Paragraph 3.3 "Sewer Excavation." When sewer is complete, the interior surface shall conform on bottom accurately to grades and alignment fixed or given by Engineer. Special care shall be taken to provide a firm bedding in good material, select borrow, stone backfill or 3,000 p.s.i. concrete, as authorized, for length of each joint and 1/2 of the circumference. Holes shall be provided to relieve bells from bedding strain, but not so large to allow separation of the bell from barrel by settlement after backfilling. All pipe shall be cleaned out, and left clean. Every third joint shall be filled around immediately after being properly placed.

B. Jointing – Comply with manufacturer's recommendations for assembly of joint components, lubrication, and making joints. When pipe laying is interrupted, secure piping against movement and seal open ends to prevent the entrance of water, mud, or foreign material.

C. Placing and Compacting Pipe Embedment – Place embedment materials by methods that will not disturb or damage the pipe. Work in and tamp haunching material in area between the bedding and underside of pipe before placing and compacting remainder of embedment in pipe zone. Do not permit compaction equipment to contact and damage the pipe. Use compaction equipment and techniques compatible with materials used and location in the trench. Before using heavy compaction or construction equipment directly over the pipe, place sufficient backfill to prevent damage, excessive deflections, or other disturbance of the pipe.

D. Rock or Unyielding Materials in Trench Bottom – If ledge rock, hard pan, shale, or other unyielding material, cobbles, rubble, debris, boulders, or stones larger than 1.5–inches are encountered in the trench bottom, excavate a minimum depth of 6–inches below pipe bottom and replace with proper embedment material.

E. Vertical Risers – Provide support for vertical risers as commonly found at service connections, cleanouts, and drop manholes to preclude vertical or lateral movement. Prevent the direct transfer of thrust due to surface loads and settlement, and ensure adequate support at points of connection to main lines.

F. Exposing Pipe for Making Service Line Connections – When excavating for a service line connection, excavate material from above the top of main line before removing material from sides of pipe. Materials and density of service line embedment shall conform to specifications for the main line.

G. Cleanouts and access boxes shall be installed as shown on the construction drawings. Install concrete collar around access box as shown on detail.

H. Manhole Connections – Use flexible water stops, resilient connectors, or other flexible systems acceptable to the Engineer making watertight connections to manholes and other structures. Fill annular space between pipe and precast concrete on inside of manhole with non–shrink grout.

I. Jacking and Boring – Steel casing of diameter shown on the plans shall be jacked and bored in location indicated. Joints between sections of the steel casing shall be of a continuous weld made by a certified welder. Jacking and boring shall be in accordance with Georgia Department of Transportation Standard Specifications. Carrier pipe shall be installed as shown on the detail. After carrier pipe has been installed, ends of the casing shall be sealed using a rubber enclosure and stainless steel straps or brick and mortar.

Where work involves a highway, a Resident Engineer of the State Department of Transportation shall be notified 3 days before crossing is started. Where work involves a railroad, the work shall conform to requirements of AREA specifications. Division Superintendent of the Railroad shall be notified 3 days prior to beginning work. Before commencing work within the right–of–way of railroads or highways, Contractor shall verify Owner has obtained required permits.

3.6 SEPARATION BETWEEN WATER & SANITARY SEWER

A. Parallel Installation:

1. Water mains shall be laid at least 10 feet horizontally from any existing or proposed sanitary sewer, storm sewer, or sewer manhole. The distance shall be measured edge–to–edge.

2. When conditions prevent a horizontal separation of 10 feet, water main may be laid closer to a sewer (on a case–by–case basis) provided the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation where bottom of water main is at least 18 inches above top of sewer. It is advised the sewer be constructed of materials and with joints equivalent to water main

standards of construction and be pressure tested to assure water–tightness prior to backfilling.

B. Crossing:

1. Water mains crossing house sewers, storm sewers, or sanitary sewers shall be laid to provide a separation of at least 18 inches between the bottom of water main and top of sewer. At crossings, one full length of water pipe shall be located so both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required.

2. When conditions prevent a vertical separation of 18 inches, the sewer passing over or under water mains shall be constructed of materials and with joints equivalent to water main standards of construction and shall be pressure tested to assure water–tightness prior to backfilling.

3. When water mains cross under sewers, additional measures shall be taken by providing:

a. a vertical separation of at least 18 inches between bottom of the sewer and top of water main;

b. adequate structural support for sewers to prevent excessive deflection of joints settling on and breaking the water mains;

c. length of water pipe be centered at the point of crossing so joints will be equidistant and as far as possible from sewer; and

d. both sewer and water main shall be constructed of water pipe and subjected to hydrostatic tests, as prescribed in this document. Encasement of the water pipe in concrete shall also be considered.

3.7 BACKFILLING

A. All trenches and excavation shall be backfilled immediately after pipes are laid therein, unless other protection of the pipe line is directed. Backfilling material shall be selected and deposited with special reference to the future safety of pipes. Except where special methods of bedding and tamping are provided for, clean earth or sand shall be solidly tamped about pipe up to a level at least 2 feet above top of pipes, and shall be carefully deposited to uniform layers, each layer solidly tamped or rammed with proper tools to not injure or disturb the pipeline. Remainder of the trench backfilling shall be carried on simultaneously on both sides of pipe in such a manner preventing injurious side pressure. The material used shall be selected from excavations anywhere on site if any of this soil is suitable. Backfill material shall be clean and free of rock, organic and other deleterious matter.

Under traffic areas, the top 24 inches of backfill material shall be compacted to a density of not less than 98% of maximum laboratory density at optimum moisture. Below the 24–inch line and to and including area around pipe, density shall not be less than 95% of maximum laboratory density at optimum moisture. In non–traffic areas, the backfill material shall be compacted to a density of not less than 90% of maximum laboratory density at optimum moisture unless otherwise accepted by

Engineer. Compaction tests shall be conducted in accordance with ASTM D 6938 by an independent testing laboratory. Tests are to be taken at the direction of Engineer.

Whenever trenches have not been properly backfilled, or if settlement occurs, they shall be refilled, smoothed off and finally made to conform to the ground surface. Backfilling shall be carefully performed, and original surface restored to the full satisfaction of Engineer immediately after installation.

Where thermoplastic (PVC) pipe is installed, Contractor shall take precautions in accordance with ASTM D 2321, during backfilling operations so not to create excessive side pressures, or vertical or horizontal deflection of the pipe nor impair flow capacity.

3.8 MANHOLES

A. Manholes shall be constructed where shown on the drawings or where directed by Engineer. The channel in bottom of manholes shall be smooth and properly rounded. Special care must be exercised in laying the channel and adjacent pipes to grade. Manhole top elevations shall be greater than or equal to the 50–year flood elevation, unless watertight covers are provided. Tops of manholes outside of roads shall be built to grades 1–inch above ground surface in developed areas and 6 inches above ground surface in undeveloped areas unless otherwise shown on the plans. Manholes in roads shall be built to grades designated by the Engineer. Manhole sections with either honeycomb defects; exposed reinforcing; broken/fractured tongue or groove; or cracked walls will be subject to rejection by Engineer for use on the project. When mastic sealant is used, improperly applied primer will also be cause for rejection.

No leaks in any manhole will be acceptable. All repairs made from inside the manhole shall be made with mortar composed of one part Portland cement and two parts clean sand. The mixing liquid shall be straight bonding agent equivalent to "Acryl 60."

3.9 STONE BEDDING

A. Where, in the Engineer's or Geotechnical Consultant's opinion, subgrade of pipe trench is unsuitable material, Contractor shall remove unsuitable material to a depth determined by Engineer or Geotechnical Consultant and furnish and place stone backfill in trench to stabilize subgrade. Presence of water does not necessarily mean stone backfill is required. If well points or other types of dewatering will remove the water, Contractor shall be required to completely dewater trench in lieu of stone backfill. Stone bedding will be limited to areas where well pointing and other conventional methods of dewatering will not produce a dry bottom. Stone shall be placed 4 feet wider than the outside diameter of pipe. The pipe shall be carefully bedded in stone as specified, or in accordance with manufacturer's recommendations.

3.10 SAND BEDDING AND BACKFILL

A. Where, in the Engineer's or Geotechnical Consultant's opinion, character of soil is unsuitable for pipe bedding, even though dewatered, additional depth of

excavation as determined by Engineer or Geotechnical Consultant shall be made and replaced with clean sand furnished by Contractor.

3.11 DEFLECTION

A. It is the Contractor's responsibility to assure backfill is sufficient to limit pipe deflection to no more than 5%. When flexible pipe is used, a deflection test shall be made by Contractor on the entire length of installed pipeline, not less than 30–days after completion of all backfill and placement of any fill. Deflection shall be determined by use of a deflection device or by use of a spherical, spheroidal, or elliptical ball, a cylinder, or circular sections fused to a common shaft. Ball, cylinder, or circular sections shall have a diameter, or minor diameter as applicable, of 95% the inside pipe diameter. The ball, cylinder, or circular sections shall be of a homogeneous material throughout, shall have a density greater than 1.0 as related to water at 39.2 degrees F, and shall have a surface brinell hardness of not less than 150. The device shall be center bored and through bolted with a 1/4 inch minimum diameter steel shaft having a yield strength of 70,000 p.s.i. or more, with eyes at each end for attaching pulling cables. The eye shall be suitably backed with flange or heavy washer; a pull exerted on opposite end of shaft shall produce compression throughout remote end of ball, cylinder, or circular section. Circular sections shall be spaced so distance from the external faces of front and back sections shall equal or exceed diameter of circular section. Failure of the ball, cylinder, or circular section to pass freely through a pipe run, either by being pulled through by hand or by being flushed through with water, shall be cause for rejection of individual run. When a deflection device is used for the test in lieu of a ball, cylinder, or circular sections described, such device shall be acceptable to Engineer prior to use. Device shall be sensitive to 1.0% of diameter of pipe being measured and shall be accurate to 1.0% of indicated dimension. Installed pipe showing deflections greater than 5% of the normal diameter of pipe shall be retested by a run from opposite direction. If retest also fails, the suspect pipe shall be repaired or replaced at no cost to Owner.

3.12 LEAKAGE

A. In no stretch of sewer between any two adjoining manholes shall infiltration/exfiltration exceed 25 gallons/day/inch of pipe diameter per mile of pipe. In case leakage exceeds this amount, the sewer shall not be accepted until such repairs and replacements are made to comply with above requirements. Such corrections will be made at the Contractor's expense. All visible leaks shall be repaired, regardless of the amount of leakage.

B. Lines shall be tested for leakage by low pressure air testing, infiltration tests, or exfiltration tests, as appropriate. Low pressure air testing for PVC pipe shall be as prescribed in ASTM F 1417. Prior to infiltration or exfiltration tests, trench shall be backfilled up to at least the lower half of pipe. If required, sufficient additional backfill shall be placed to prevent pipe movement during testing, leaving the joints uncovered to permit inspection. Visible leaks encountered shall be corrected regardless of leakage test results. When water table is 2 feet or more above top of pipe at the upper end of pipeline section to be tested, infiltration shall be measured using a suitable weir or other device acceptable to Engineer. When Engineer determines infiltration cannot be properly tested, an exfiltration test shall be made by filling the line to be tested with water so a head of at least 2 feet is provided above both water table and top of pipe at upper end of pipeline to be tested.

The filled line shall be allowed to stand until pipe has reached its maximum absorption, but not less than 4 hours. After absorption, the head shall be re–established. The amount of water required to maintain this water level during a 2–hour test period shall be measured. Leakage as measured by either the infiltration test or exfiltration test shall not exceed 25 gallons per inch diameter per mile of pipeline per day. When leakage exceeds the maximum amount specified, satisfactory correction shall be made and retesting accomplished. Testing, correction, and retesting shall be made at no additional cost to the Owner.

C. The Contractor shall furnish equipment and plugs and subject force mains to hydrostatic tests at 100 p.s.i. for a period of two hours. Any leaks shall be located and repaired. Each section tested shall be slowly filled with water, care being taken to expel all air from the pipes. No pipe installation will be accepted until leakage during pressure test is less than the number of gallons listed for each 1000–feet of pipe tested:

6 inches & less – 0.9 gallons	12 inches – 1.80 gallons
8 inches – 1.20 gallons	14 inches – 2.10 gallons
10 inches – 1.50 gallons	16 inches – 2.40 gallons

3.13 CLEANING AND ACCEPTANCE

A. Before acceptance of sewer system, it shall be tested and cleaned to the satisfaction of Engineer. Where any obstruction is met, Contractor will be required to clean sewers by means of rod and swabs or other instruments. The pipe line shall be straight and show a uniform grade between manholes. The Engineer shall check lines by lamping or other methods to determine final acceptance.

3.14 CLOSING PIPE

A. When work or pipe installation is suspended, either for the night or at other times, end of sewer must be closed with a tight cover. Contractor will be held responsible for keeping the sewer free from obstruction.

3.15 PARTIAL ACCEPTANCE OF THE WORK

A. Owner reserves right to accept and use any part of the work. Engineer shall have power to direct on what line the Contractor shall work and order thereof.

3.16 GRASSING

A. Grassing of areas disturbed during construction shall be in accordance with Section 02902 – "Grassing."

3.17 RECORD DATA

A. It will be required of the Contractor to keep accurate, legible records, locating all sewers, force mains, tees, and laterals. These records will be made available to Engineer before final review for incorporation into the Engineer's Record Drawings.

Final payment to the Contractor will be withheld until all such information is received and accepted.

3.18 REMOVE AND REPLACE PAVEMENT

A. Pavement shall only be removed after prior written authorization by the Owner. Pavement removed and replaced shall be constructed in accordance with latest specifications of the State Department of Transportation. Traffic shall be maintained and controlled per State Department of Transportation regulations.

Edges of the pavement shall be cut to a neat straight line with a masonry saw. Backfill shall be compacted and tested and a concrete base course of 5,000 p.s.i. placed on the fill as shown on details. The concrete base shall be placed within 24 hours after pipeline is installed. A temporary wearing surface may be used provided it presents a smooth surface. The final wearing surface shall be 2 inches of 9.5 mm, asphaltic concrete.

3.19 METALLIC DETECTOR TAPE

A. Contractor shall place metallic detector tape, suitably coded, directly over all installed pipes at a depth of 18 inches below the finished surface.

Note: Wire on all pipes shall be required in Georgia after January 1, 2001.

3.20 TRACER WIRE

A. Tracer wire will be installed on all force mains, directly on top of the pipe. Wire shall be secured to the pipe with tape or other acceptable methods at spacings of no more than 36–inches apart. Where service laterals connect to main lines, the wire connection shall be made with a direct bury moisture resistant connector. Installation of connector shall be per manufacturer's instructions. The insulated wire must maintain electrical continuity. This tracer wire system shall be checked and tested by the Contractor, in presence of Engineer or Owner prior to acceptance of force main . All equipment, meters, detectors, etc., needed for testing shall be furnished by the Contractor.

3.21 CONNECT SEWERS TO EXISTING STRUCTURES

A. Contractor shall connect the system to existing structures where indicated. For brick structures, a hole not more than 4 inches larger than the outside diameter of new pipe shall be cut neatly in structure, new pipe laid so it is flush with inside face of structure, and annular space around pipe filled with a damp, expanding mortar or grout to make a watertight seal. For precast structures, core proper size hole in structure for pipe being connected, attach flexible sleeve into cored hole and connect new pipe into flexible sleeve with a stainless steel band.

3.22 FIELD QUALITY CONTROL

A. Soil and density tests shall be made by a testing laboratory acceptable to the Engineer. Laboratory tests of the soil shall be made in accordance with ASTM D

1557. In–place density tests shall be made in accordance with ASTM D 6938. Results of the tests shall be furnished to the Engineer.

The minimum number of tests required shall be:

Backfill over sewer in traffic areas…….	1 per 100 linear feet or less for each 4 feet of depth or portion thereof.
Backfill over sewer in non–traffic areas…	1 per 500 linear feet or less for each 6 feet of depth or portion thereof.

3.23 AIR RELEASE VALVE

A. The manhole and installation of valve shall be in accordance with detail on drawings. Prior to deciding on the location of any air release valve, Contractor shall provide Engineer with an accurate profile of installed force main so high points in system can be determined.

3.24 FORCE MAIN

A. Ductile Iron Force Mains shall be installed in accordance with AWWA C 600.

B. PVC Force Main shall be installed in accordance with ASTM D 2774.

C. The Contractor shall perform excavation of whatever substances are encountered to a depth that will provide a minimum cover over the top of the pipe of 48 inches from the existing or proposed finished grade.

D. Alignment and Grade – The force mains shall be laid and maintained on lines and grades established by the plans and specifications for the project. Fittings, valves, and tapped or bossed outlets must be installed at the required locations unless field conditions warrant otherwise, and these changes are approved in accordance with the specifications. Valve–operating stems shall be oriented to allow proper operation.

E. Prior Investigation – Prior to excavation, an investigation shall be conducted to determine the location of existing underground structures and conflicts. During excavation, damage to existing structures should be avoided. Special precautions shall be taken when the force main being installed crosses or is adjacent to a facility that is cathodically protected.

F. Unforeseen Obstructions – When obstructions not indicated on the plans interfere with the progress of work, an alteration of the plans is required. These alterations or deviation in line and grade, or the removal, relocation, or reconstruction of the obstructions shall be performed in accordance with the specifications.

G. Trench Construction – The trench shall be excavated to the required alignment, depth, and width specified or shown on the plans and shall conform with all federal, state or provincial, and local regulations for the protection of the workers.

1. Trench Preparation – Trench preparation shall proceed in advance of pipe installation as stated in the specifications.

2. Discharges from trench dewatering pumps shall be directed away from the trench to prevent trench instability and shall be in accordance with federal, state or provincial, and local point–discharge requirements.

3. Excavated material shall be placed in a manner that will not obstruct the work nor endanger the workers or the public, or obstruct sidewalks, driveways, roadways, or other structures. Excavated material shall be placed in compliance with federal, state or provincial, and local regulations.

4. Width – The width of the trench at the top of the pipe shall equal the single–pass capabilities of normally available excavating equipment. The width shall permit the pipe to be laid and joined properly and to allow the backfill to be placed in accordance with the specifications. Trench widths shown below may be used as a guide. When required, trenches shall be wider to permit the placement of timber supports, sheeting, bracing, and appurtenances as required by the safety requirements of the agency having jurisdiction.

Nominal Pipe Size		**Trench Width**	
In.	**(mm)**	**In.**	**(mm)**
3 and 4	(76 and 102)	28	(0.71)
6	(152)	30	(0.76)
8	(203)	32	(0.81)
10	(254)	34	(0.86)
12	(305)	36	(0.91)
14	(356)	38	(0.97)
16	(406)	40	(1.02)
18	(457)	42	(1.07)
20	(508)	44	(1.12)
24	(610)	48	(1.22)
30	(762)	54	(1.37)
36	(914)	60	(1.52)
42	(1,067)	66	(1.68)
48	(1,219)	72	(1.83)
54	(1,400)	78	(1.98)
60	(1,500)	84	(2.13)
64	(1,600)	88	(2.24)

5. Bell Holes – Holes for the bells shall be provided at each joint, and they shall be no larger than necessary to allow joint assembly and to ensure the pipe barrel will lie flat on the trench bottom. The dimensions of bell–hole depressions for push–on type joints should be large enough to ensure the pipe is not resting on the bells and is supported by the full length of the pipe barrel.

6. Other than noted previously, the trench bottom shall be true and even to provide support for the full length of the pipe barrel. A slight depression may be provided to allow withdrawal of pipe slings or other lifting tackle without damaging coating or polyethylene encasement.

7. Rock Conditions – When excavation of rock is necessary, all rock shall be removed to provide a clearance below and on each side of all pipe and

fittings of at least 6 in. (150 mm) for nominal pipe sizes 24 in. (610 mm) or smaller and 9 in. (230 mm) for nominal pipe sizes 30 in. (762 mm) and larger. When excavation is completed, a layer of appropriate backfill material shall be placed on the bottom of the trench to the appropriate depths, then leveled and tamped.

8. In all cases, the specified clearances shall be maintained between the bottom of all pipe and appurtenances and any part, projection, or point of rock, boulder, or stone of sufficient size and placement that could cause a fulcrum point or pointload.

9. Previous Excavations–If the trench passes over a previous excavation, the trench bottom shall be sufficiently compacted to provide support equal to that of the native soils or conform to other regulatory requirements in a manner that will prevent damage to the existing installation.

H. Protecting Property–Trees, shrubs, fences, and all other property and surface structures shall be protected during construction, unless their removal is shown in the plans and specifications.

1. All properties that have been disturbed shall be restored as completely as practical to their original condition.

I. Any cutting of tree roots or branches shall be performed in accordance with the specifications.

J. Temporary support, adequate protection, and maintenance of all underground and surface structures, drains, sewers, and other obstructions encountered during the work shall be provided in accordance with specifications or applicable regulations.

K. Installing Pipe – The proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the work. All pipe, fittings, valves, and other appurtenances shall be lowered carefully into the trench using a backhoe, a crane, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to force main materials and protective coatings and linings. Under no circumstances shall force main materials be dropped or dumped into the trench. Where practical, the trench should be dewatered prior to installation of the pipe.

K. Examining Material – 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 final disposition as required by the specifications.

L. Pipe Ends – 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 be free from dirt, sand, grit, or any foreign materials before the pipe is laid.

M. Pipe Cleanliness – 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.

N. Pipe Placement – 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.

O. Direction of Bells – It is common practice to lay pipe with the bells facing the direction in which work is progressing; however, it is not mandatory. For example, when the main is being laid on a slope, the pipe is frequently laid with the bells facing uphill for ease of installation.

P. Pipe Plugs – At times when pipe–laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means as specified. The plug shall be fitted with a means for venting. When practical, the plug shall remain in place until the trench is pumped completely dry. Care must be taken to prevent pipe flotation, if the trench fills with water.

Q. Prior to removal of the plug for extending the line or for any other reason, air and/or water pressure in the line shall be released.

R. Joint Assembly – Shall be performed in accordance to AWWA C 600.

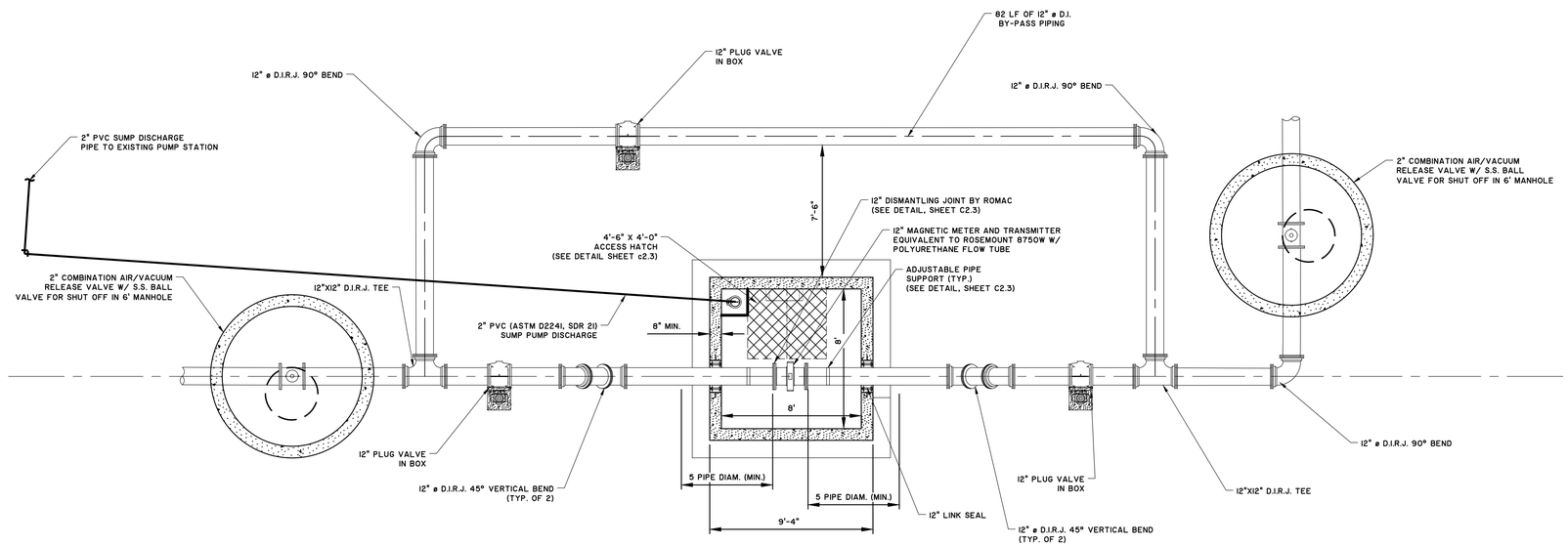
S. Hydrostatic Testing – Shall be performed in accordance with AWWA C 600.

3.25 BYPASSING

A. Bypassing of raw wastewater onto the ground or into a receiving stream is prohibited.

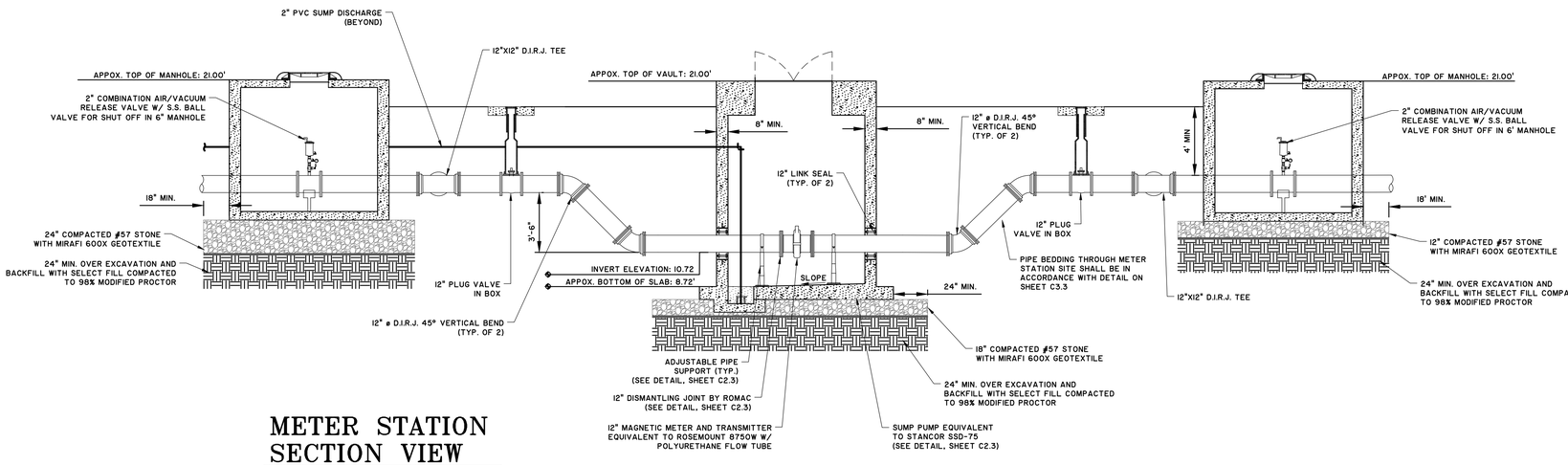
B. Bypassing shall be accomplished with pumping equipment sufficient to maintain the flow of wastewater. Contractor shall provide pump, hoses, materials, and labor to operate and maintain the bypassing operation. A backup pump shall also be made available by the Contractor. Bypassing operations shall be reviewed and acceptable to the sewer system operator before being implemented.

END OF SECTION



METER STATION PLAN VIEW

SCALE: 1/4" = 1'



METER STATION SECTION VIEW

SCALE: 1/4" = 1'

GENERAL NOTES:

1. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, DIMENSION AND ELEVATIONS BEFORE STARTING WORK.
2. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, ADEQUACY, AND SAFETY OF ERECTION, BRACING, SHORING, TEMPORARY SUPPORTS, ETC. THE STRUCTURAL ELEMENTS ARE NOT STABLE UNTIL THE STRUCTURE IS COMPLETE.
3. CHAMFER OR ROUND ALL EXPOSED CORNERS MINIMUM 1".
4. REINFORCING STEEL SHALL HAVE THE FOLLOWING CONCRETE COVER UNLESS NOTED OTHERWISE:
   CONCRETE CAST AGAINST EARTH (NOT FORMED) ____ 3"
   FORMED CONCRETE EXPOSED TO EARTH OR WEATHER
   #6 THROUGH #18 BARS ____ 2"
   #5 BARS AND SMALLER ____ 1 1/2"
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER
   #11 SLABS, JOISTS AND WALLS ____ 1"
   BEAMS, COLUMNS (STIRRUPS) ____ 1 1/2"
5. PRECAST CONCRETE DESIGN, MANUFACTURE, AND ERECTION SHALL CONFORM TO THE FOLLOWING:
   A. ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION.
   B. PCI MNL-117 "MANUAL FOR QUALITY CONTROL FOR PLANTS AND PRODUCTION OF PRECAST CONCRETE PRODUCTS", LATEST EDITION.
   C. PCI DESIGN HANDBOOK, LATEST EDITION.
6. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 5,000 PSI.
7. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60 UNLESS NOTED OTHERWISE.
8. PRECAST METER VAULT SHALL BE DESIGNED, SEALED, AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF GEORGIA EXPERIENCED IN THE DESIGN OF PRECAST CONCRETE. THE DESIGN SHALL INCLUDE PROVISIONS FOR HANDLING STRESSES AND CONSTRUCTION LOADS INCLUDING HS20 LOADING PER AASHTO - REPRODUCED COPIES OF ASTM C1433 "STANDARD SPECIFICATION FOR PRECAST REINFORCED CONCRETE MONOLITHIC BOX SECTIONS FOR CULVERTS, STORM DRAINS AND SEWERS" WILL NOT BE ACCEPTED AS A SUBSTITUTE FOR DESIGN.
   METER VAULT DESIGN CRITERIA
   CONCRETE: f'c 5,000 PSI
   REINFORCING: f'y 60,000 PSI
   SOIL LOADING: gd = 110 PCF
   gs = 60 PCF
9. CONTRACTOR IS RESPONSIBLE FOR PROCURING THE SERVICES OF A GEOTECHNICAL ENGINEER DETERMINING SOIL CONDITIONS, CHARACTERISTICS, GEOTECHNICAL PARAMETERS, FOUNDATION, AND BACK FILL REQUIREMENTS WITH ANY AND ALL INVESTIGATIONS, BORINGS, AND STUDY NECESSARY.
10. THE SOILS TO BE USED AS STRUCTURAL FILL SHALL BE FREE OF ORGANICS, ROOTS, OR OTHER DELETERIOUS MATERIALS. IT SHALL BE NON-PLASTIC GRANULAR MATERIAL CONTAINING LESS THAN 25 PERCENT FINES PASSING THE NO. 200 SIEVE.
11. ALL STRUCTURAL FILLS SHALL BE PLACED IN THIN (EIGHT TO TEN INCHES LOOSE) LIFTS AND COMPACTED TO A MINIMUM OF 98% OF THE SOIL'S MODIFIED PROCTOR MAXIMUM DRY DENSITY (ASTM D-1557), UNLESS OTHERWISE SPECIFIED BY GEOTECHNICAL CONSULTANT.
12. FILL BROUGHT TO THE SITE SHALL BE WITHIN TWO PERCENT (WET OR DRY) OF THE OPTIMUM MOISTURE CONTENT. SOME MANIPULATION OF THE MOISTURE CONTENT (SUCH AS WETTING, DRYING) WILL BE REQUIRED DURING THE FILLING OPERATION TO OBTAIN THE REQUIRED DEGREE OF COMPACTION, UNLESS OTHERWISE SPECIFIED BY GEOTECHNICAL CONSULTANT.
13. **CONTRACTOR SHALL PROVIDE COMPACTION TEST RESULTS FOR ALL FILL MATERIAL WITHIN AREA OF THE METER VAULT. A MINIMUM OF TWO (2) TESTS SHALL BE PERFORMED AND RESULTS SUBMITTED TO ENGINEER AND GOVERNING WATER AND SEWER AUTHORITY PRIOR TO CONSTRUCTION OF SLABS.**
14. EXTERIOR OF METER VAULT SHALL BE COATED WITH ACRYLIC DAMP PROOF COATING SYSTEM EQUIVALENT TO CONSEAL CS-55.
15. INTERIOR OR MANHOLE AND METER VAULT SHALL BE COATED WITH 2 COATS OF BITUMINOUS COATING, PER BRYAN COUNTY'S DETAILS AND SPECIFICATIONS.
16. ALL BOLTS INSIDE METER VAULT SHALL BE 316 STAINLESS STEEL UNLESS OTHERWISE NOTED.
17. DO NOT PAINT ALUMINUM QUICK CONNECT COUPLINGS.
18. ALL CONDUIT ENTERING THE METER VAULT SHALL BE SEALED AIR TIGHT AT THE MOTOR JUNCTION BOXES WITH DUCT SEAL.
19. COORDINATE FORCE MAIN SEWER INVERT ELEVATIONS WITH HORIZONTAL CONSTRUCTION.
21. BYPASS SUCTION PIPING SHALL BE C151, PRESSURE CLASS 350 DUCTILE IRON PIPE. FITTINGS WITHIN THE METER VAULT SHALL BE FLANGED (CLASS 53) DUCTILE IRON. ALL DUCTILE IRON PIPING IN THE METER VAULT SHALL BE PRIMED AND COATED WITH RAVEN 405 ON THE OUTSIDE AND PROTECTO 401 ON THE INSIDE.
22. THE CONTRACTOR SHALL PROVIDE AND INSTALL A SUMP PUMP CONTROLLER EQUIVALENT TO PUMP MANUFACTURER'S RECOMMENED CONTROLLER.
23. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING, INSTALLING, PROGRAMMING, COMMISSIONING, AND ENGINEERING ALL COMPONENTS OF THE PUMP CONTROLLER/SCADA SYSTEM.
24. ELECTRICAL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR WITH A LOCAL BUSINESS LICENSE.
25. ELECTRICAL PERMITS SHALL BE OBTAINED FROM AND FEES PAID TO THE AUTHORITY HAVING JURISDICTION.
26. ELECTRICAL CONTROLS SHALL BE MOUNTED ABOVE THE 100 YEAR FLOOD ELEVATION.
27. ALL CONDUITS INTO THE CONTROL PANEL MUST BE SEALED.
28. ELECTRICAL CONTROLS TO BE LABELED WITH 1"x3" BLACK PLACARD WITH 1/2" LETTERS FOR LABELING ALL CONTROLS.
29. ALL TERMINATION'S SHALL BE WITH LUGS.

NO.	REVISION PER ADDENDUM 3	BY	DATE
1		CMP	11/22/22

THOMAS & HUTTON
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Savannah, GA 31405 • 912.234.5300
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BID SET - NOT FOR CONSTRUCTION

BRYAN COUNTY COMMISSION
BRYAN COUNTY, GEORGIA

SOUTH BRYAN COUNTY SEWER FLOW DIVERSION TO RICHMOND HILL

METER STATION DETAIL

JOB NO:	J-27691.0057
DATE:	7/27/22
DRAWN:	CMP
DESIGNED:	CMP
REVIEWED:	AJB
APPROVED:	TVT
SCALE:	AS SHOWN

C2.2