SAK CONSTRUCTION, LLC

DEKALB COUNTY PROPOSAL

for

Cured-in-Place-Pipe (CIPP) Lining

SAK™
Pipeline Infrastructure. Solved.™

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864 Hoff Road
O'Fallon, MO 63366
www.sakcon.com

December 1, 2021

DeKalb County
Attn: Cassandra Marshall, PMP
4572 Memorial Drive
Decatur, GA 30032

Re: DeKalb County, GA – 2021 CIPP

Ms. Marshall:

SAK Construction, LLC is pleased to offer the following quotation as per the OMNIA Partners Cooperative Purchasing Agreement No. R170802:

*Please see attached pricing.

INCLUSIONS:

- Pipeline cleaning, measuring of pipe and diameter, televising, and service connection identification.
- Bypass Pumping up to a 4-inch pump and layflat. If larger pumps are needed or hard discharge piping are needed, they will be charged per OMNIA pricing.
- CIPP Installation, curing, and end cutting per ASTM F-1216 latest revision.
- Live service connection reinstatement. Only capped services will not be cut.
- CCTV Acceptance Inspection.
- Traffic Control.
- Performance and Payment Bonds.
- Price includes one mobilization and demobilization per work order at unit price provided.

EXCLUSIONS:

- Any special insurance required, i.e., railroad protective insurance.
- Traffic Control Plans (if required, will be charged per OMNIA pricing).
- Point repairs beyond the identified scope.
- Permits (to be paid out of Permit Allowance item).

SCOPE CLARIFICATIONS:

- 1 – Mobilization
  - One (1) mobilization will be charged per work order.
- 4 – Normal Cleaning
  - Normal cleaning includes up to three (3) passes with the jetter and CCTV inspection.
- 5 – Heavy Cleaning
  - Heavy cleaning will apply if greater than three (3) passes with the jetter are required or mechanical equipment is required for tuberculation removal, root removal, etc. Heavy cleaning footage will be paid from manhole to manhole. Heavy cleaning price includes normal cleaning.
- 19-32 – External Point Repairs
  - External (open-cut) point repairs on both mainline and laterals are assumed to be on 6”-12” diameter mains. Point repairs include excavation, backfilling with existing material, and haul-off of spoils. Point repair pricing assumes repair will take place out of roadway. If repair is in roadway, pavement repair items will be paid out of “Ancillary Items” in addition to point repair price. Restoration for point repairs will be paid out of “Ancillary Items” as well. If traffic control beyond standard cones and signage is required, it will be paid out of “Ancillary Items.”

PAYMENT TERMS:

- Net 30 days after receipt of an invoice
- Partial monthly payments will be requested
- Final Payment in full within 30 days of completion of SAK work

Thank you for the opportunity to quote on this project. Please call with any questions.

Sincerely,
SAK Construction, LLC

Brian Ackerman

Brian Ackerman
General Manager – Southeast Region

_____ _____
Accepted By Date
Printed Name:
Title:

Item	Description	Quantity		Unit Price	Total Price
Mobilization (Includes Demobilization)					
1	CIPP Crew	5	EA	$10,000.00	$50,000.00
2	Point Repair Crew	5	EA	$1,156.25	$5,781.25
CCTV & Cleaning					
3	CCTV Inspection of <= 12" Pipe (Post TV)	70320	LF	$2.50	$175,800.00
4	CCTV Inspection of > 12" Pipe (Post TV)	1000	LF	$2.50	$2,500.00
5	Normal Cleaning 6"-12" pipe (<=3 passes with jetter)	70320	LF	$5.50	$386,760.00
6	Heavy Cleaning 6"-12" pipe (>3 passes with jetter, includes Normal Cleaning)	5000	LF	$10.50	$52,500.00
7	Protruding Tap Removal	5	EA	$1,375.00	$6,875.00
8	Dye Test of Service Connection	5	EA	$300.00	$1,500.00
CIPP					
9	*CIPP 6" x 4.5mm	302	LF	$41.00	$12,382.00
10	*CIPP 8" x 6.0mm	64819	LF	$32.50	$2,106,617.50
11	*CIPP 10" x 7.5mm	2949	LF	$44.00	$129,756.00
12	*CIPP 12" x 9.0mm	2250	LF	$62.00	$139,500.00
13	Internal Service Lateral Reconnection	700	EA	$300.00	$210,000.00
CIPP Laterals					
14	4"-6" Lateral Liner (Full Wrap, up to 20" from main)	200	EA	$2,250.00	$450,000.00
Manhole Rehabilitation					
15	Std 4-Ft Dia. MH - 1" Portland-Based Cementitious	500	VF	$172.50	$86,250.00
16	Std 4-Ft Dia. MH - Composite - 1" cementitious + 125 mil Epoxy/Polyurea	500	VF	$690.00	$345,000.00
17	Rebuild Bench and Invert	1	EA	$1,150.00	$1,150.00
18	Holiday Test Manhole (Epoxy only)	1	EA	$460.00	$460.00
External Point Repairs (Mainline)					
19	0-12 Lft Length 0-10 Vft Depth	55	EA	$13,575.00	$746,625.00
20	Additional Lft > 12 Lft (0-10 Vft Depth)	20	LF	$375.00	$7,500.00
21	0-12 Lft Length (>10 Vft to 16 Vft Depth)	27	EA	$14,825.00	$400,275.00
22	Additional Lft > 12 Lft (> 10 to 16 Vft Depth)	20	LF	$500.00	$10,000.00
23	0-12 Lft Length (>16 Vft to 22 Vft Depth)	8	EA	$16,075.00	$128,600.00
24	Additional Lft > 12 Lft (> 16 to 22 Vft Depth)	20	LF	$625.00	$12,500.00
25	Unsuitable Soil Haul Off and Replace with Stone or Soil	100	Ton	$156.25	$15,625.00
External Point Repairs (Laterals)					
26	0-5 Lft Length 0-10 Vft Depth	34	EA	$13,575.00	$461,550.00
27	Additional Lft > 5 Lft (0-10 Vft Depth)	20	LF	$375.00	$7,500.00
28	0-5 Lft Length (>10 Vft to 16 Vft Depth)	42	EA	$14,825.00	$622,650.00
29	Additional Lft > 5 Lft (> 10 to 16 Vft Depth)	20	LF	$500.00	$10,000.00
30	0-5 Lft Length (>16 Vft to 22 Vft Depth)	11	EA	$16,075.00	$176,825.00
31	Additional Lft > 5 Lft (> 16 to 22 Vft Depth)	20	LF	$625.00	$12,500.00
32	Unsuitable Soil Haul Off and Replace with Stone or Soil	100	Ton	$156.25	$15,625.00
Ancillary Items					
33	Traffic Control (see specification)	15	EA	$1,875.00	$28,125.00
34	Asphalt Pavement Repair	460	SY	$143.75	$66,125.00
35	Concrete Pavement Repair	115	SY	$156.25	$17,968.75
36	Seed and Straw in Place	1150	SY	$18.75	$21,562.50
37	Sod in Place	575	SY	$33.13	$19,046.88
38	Owner's Allowance	1	Allow	$1,000,000.00	$1,000,000.00
39	**Public Outreach	1	Allow	$529,908.50	$529,908.50
40	Bonds and Insurance	1	LS	$144,546.40	$144,546.40
41	***Sales Tax on Permanent CIPP Materials	1	Allow	$53,205.80	$53,205.80
42	****Permits	1	Allow	$50,000.00	$50,000.00
			Total		**$8,721,095.58**

*CIPP pricing includes thickness increases per OMNIA to DeKalb County specifications.

**Public Outreach (Allowance) will be paid monthly per invoices received as a pass-through cost without markup.

***Sales Tax on Permanent CIPP Materials will be paid as a pass-through cost without markup.

****Permits will be paid as a pass-through cost without markup.

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December 1, 2021

Re: DeKalb County, GA – 2021 CIPP

1. Need to confirm what is meant by "Access into the site. We will need access for our equipment."
    - Removed from quote.

2. Need to confirm what is meant by one mobilization per purchase order. Is this per work order issued to contractor?
    - Mobilization and demobilization will be charged per work order at unit price provided.

3. Permits are listed as an exclusion. However, we require the contractor to obtain GDOT and DeKalb County permits as needed. With that being said, we need SAK to get those permits, if required. Therefore, I will need some kind of way to include a price for that work. Please advise.
    - Due to an undefined scope, we cannot quantify the cost of required permits. SAK has included an allowance pay item for permit costs.

4. P&C did not like including pricing for some items but no quantities. Please update the quote to include the quantities shown in the attached document.
    - Quote updated.

5. Need to confirm how the 1 each mobilization/demobilization for the point repair crew will be applied. Is this per point repair, per work order, or per day, etc.?
    - The point repair mobilization will be charged per work order.

6. We need to get a list of your subcontractors and what work they will be performing.
    - Cleaning/CCTV Inspection
        1. RK Reeves & Associates
    - Excavations (Point Repairs)
        1. Cleveland Carter Enterprises

7. We need the contact information for the project manager and a bio/resume.
    - See Brian Ackerman's attached resume.

8. Lastly, we need to confirm the contract is Federally compliant. In addition SAK and subcontractors will do the certified payroll submission, employee interviews, required forms to be completed for State and Federal funding, etc.
    - Yes, this contract is used by Federal Agencies such as FEMA.
    - Yes, SAK and its subcontractors will comply with certified payroll, employee interviews, required forms as required by State and Federal agencies, etc.

SAK CONSTRUCTION, LLC

DEKALB COUNTY REQUIRED SPECIFICATIONS

for

Cured-in-Place-Pipe (CIPP) Lining

1. The Contractor shall have an independent testing lab analyze finished liner samples taken from manhole cutoffs, service coupons, etc. Refer to specification Section 01410.

    a. A minimum of 1 sample shall be taken for each line segment (manhole to manhole) of liner material installed or for each manufacturing lot, if less, or as directed by the DeKalb County Watershed Management (DWM).

    b. Independent testing lab fees shall be billed under the Testing Allowance. The Contractor will be allowed a maximum markup of 5% of the independent testing invoice.

    c. Partial/Segmental/Point Repair CIPP testing shall be in accordance with specification 01510 – Sanitary Sewer Main Television and Inspection (CCTV) section 3.06.

2. The Cured-In-Place Pipe with Specification Sections 02500 – Lining with Cured-In-Place Pipe (Felt), and 02501 – Lining with Ultra-Violet Light Fiberglass Cured-In-Place Pipe.

    a. Contractor shall re-establish service connections to the sewer by cutting and brushing laterals.

    b. Approved resins are 108TA Filled Polyester Resin or Vipel L721-LTI Polyester Resin.

3. It is the contractor's responsibility to provide design of bypass system, sizing of piping/pumps redundancy.

4. CIPP deliverables shall include digital copies of; pre and post CCTV videos, CCTV log sheets, process control sheets, wet out reports and sample test results.

5. All pre and post CCTV videos shall meet the requirements per Section 01510.

6. The Contractor is to adhere to the DeKalb County safety requirements – Sections 01540 Security and Safety and 01550 Traffic Regulations (see attachments). Contractor shall meet MUTCD requirements.

7. The Contractor will utilize SharePoint for submission and approval of submittals, RFIs, inspection's reports, etc.

8. If a sewer backup, overflow or spill occurs, all clean up and associated damages are the contractor's responsibility.

9. Landfill disposal fees from cleaning debris from pipe will be reimbursed through Owner's Allowance. Contractor will be allowed a maximum markup of 5% on items paid out of Owner's Allowance and other allowance items.

10. Contractor will be required to submit an overall project schedule for DWM's approval. Contractor will also be required to submit a schedule of work listing roads and lanes affected. The schedule shall be submitted by close of business each Thursday, projecting work and expected impacts for the subsequent three (3) weeks. Contractor is also required to submit an updated project schedule with each monthly pay request.

11. Hydrant Meters – if a hydrant meter is needed for construction, the Contractor must acquire a hydrant meter from DeKalb County Watershed Management at 774 Jordan Lane, Suite 200. This meter is to be used for any and all water usage for DeKalb County's project only. Contractor will be responsible for paying all invoices and will be reimbursed through the Owner's Allowance for all usage.

12. Open construction pits shall be backfilled and closed at the end of the each working day. Exceptions shall be permitted only by the approval of the Owner. Open pits and road cuts shall be covered utilizing steel plates in accordance with DWM standards. All work sites shall be clean and safety protection elements in place at the end of the work day. No equipment shall linger in the roadway unattended.

13. The Owner's Allowance shall be used for but not limited to tree mitigation, permitting fees, and water usage. Contractor will be allowed a maximum markup of 5% on items paid out of Owner's Allowance and other allowance items.

14. The contractor shall be allotted at minimum, the number of mobilizations specified in the bid items for each work discipline. No mobilizations beyond the allotted minimum without Owner's approval.

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 — GENERAL

1.01 SECTION INCLUDES

A. This Section includes testing the Owner's Representative may require, beyond the testing required of the manufacturer, to determine if materials provided for the Project meet the requirements of these Specifications.

B. This work also includes all testing required by the Owner's Representative to verify work performed by the Contractor is in accordance with the requirements of these Specifications (i.e., concrete strength and slump testing, existing soils conditions, soil compaction, asphaltic concrete paving, etc.).

C. This work does not include materials testing required in various sections of these Specifications to be performed by the manufacturer at their facilities before shipment to the job site (i.e., testing of pipe), or testing and inspection required by referenced standards or codes including welding inspection by an AWS certified CWI, prior to during and after welding.

D. The testing laboratory or laboratories will be a 3rd party testing facility selected by the Contractor subject to approval by the Owner.

1.02 QUALIFICATIONS AND REQUIREMENTS

A. Submit the Qualifications of the Testing Services vendor and price list for the various services for review and approval.

B. Cooperation with the Owner's Representative and Contractor shall be required.

C. Provide qualified personnel promptly on notice.

D. Contractor to provide preliminary schedule for testing and timely updates as the Work progresses.

1. Establishing Schedule

    a. The Contractor shall, by advance discussion with the Owner's Representative and the testing laboratory, determine the time required for the laboratory to perform its tests and to issue each of its findings, and make all arrangements for the testing laboratory to be on-site to provide the required testing. The location and frequency of tests may be dictated at any time by the Owner's Representative at its discretion.

    b. Provide all required time within the construction schedule.

2. When changes in the construction schedule are necessary during

construction, coordinate all such schedule changes with the Owner's representative and the testing laboratory, as required.

3. When the testing laboratory is ready to test according to the determined schedule, or when timely request for such services have been made, but is prevented from testing or taking specimens due to incompleteness of the Work, or any other failure of the Contractor to be ready, all extra costs for testing attributable to the delay will be back-charged to the Contractor and shall not be borne by the Owner, including but not limited to travel charges incurred, technician time, etc.) Costs associated with retesting failed Work will be at the Contractor's expense.

E. Perform specified inspections, sampling and testing of materials.

1. Comply with specified standards, ASTM, other recognized authorities, and as specified. The most stringent shall apply.

2. Ascertain compliance with requirements of the Contract Documents.

F. Promptly notify the Owner's Representative and Contractor of the results including any irregularity or deficiency of work observed during performance of services.

G. Promptly submit three copies (two copies to the Owner's Representative and one copy to the Contractor) of report of inspections and tests in addition to those additional copies required by the Contractor with the following information included:

1. Date issued.

2. Project title and number.

3. Testing laboratory name and address.

4. Name and signature of inspector.

5. Date of inspection or sampling.

6. Record of temperature and weather.

7. Date of test.

8. Identification of product, Specification section or applicable codes standards or authorities

9. Location of Project.

10. Type of inspection or test.

11. Results of test.

    a. Observations regarding compliance with the Contract Documents.

H. Perform additional services as required.

I. The laboratory is not authorized to release, revoke, alter or enlarge on requirements of the Contract Documents, or approve or accept any portion of the Work.

1. Testing shall be in accordance with all pertinent codes, standards, authorities and regulations and with procedures and requirements of the American Society for Testing and Materials (ASTM)

1.03 DELIVERY, STORAGE & HANDLING

Promptly process and distribute all required copies of test reports and related instructions to insure all necessary retesting or replacement of materials with the least possible delay in the progress of the Work. Handle and store all test specimens in accordance with the requirements of the contract documents and all applicable standards. The most stringent shall apply.

1.04 RESPONSIBILITIES OF THE CONTRACTOR

A. Cooperate with laboratory personnel, provide access to Work and/or manufacturer's facilities.

B. Provide the laboratory with representative samples, in required quantities, of materials to be tested in a timely manner that allows for required testing and analysis. Failure to do so will not constitute cause for a claim.

C. Furnish copies of mill test reports.

D. Furnish required labor and facilities to:

1. Provide safe access to Work to be tested.

2. Assist in obtaining and handling samples at the site.

3. Facilitate inspections and tests.

4. Build or furnish a cure box for concrete cylinders or other samples as required by the laboratory.

5. Coordinate observation and testing of coatings and linings in accordance with manufacturer’s published application requirements and cure times.

E. Laboratory Tests: Where such inspection and testing are to be conducted by an independent laboratory agency, the sample(s) shall be selected by such laboratory or agency, or the Owner’s Representative, and shipped to the laboratory by the Contractor at Contractor's expense. Contractor shall make arrangements and provide all necessary assistance in obtaining the samples.

F. Copies of all correspondence between the Contractor and testing agencies shall be submitted through the Owner’s Representative. The test lab may provide test reports and related instructions directly to the Contractor provided the Owner’s

Representative is copied.

G. Inspections and tests required by codes or ordinances or by a plan approval authority, and made by a legally constituted authority, shall be the responsibility of, and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents. The Owner's Representative shall approve the Contractor's testing agency.

H. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor. In the event of a discrepancy, the final results shall be determined by the Owner's Representative and shall be based on the findings of the Owner's test lab.

I. Unless otherwise provided in the Contract Documents, all specimens and samples for test will be taken by the testing laboratory or the Owner's Representative. If specified, the Contractor shall deliver to laboratory, in a timely manner and at designated location, adequate samples of proposed materials requiring testing. Specimens provided by the Contractor are assumed to represent the materials that will be provided to the project. Changes in the materials provided are the responsibility of the Contractor and all retests shall be at the Contractor's expense.

J. The Contractor shall cooperate with laboratory personnel, and provide access to the Work and to Manufacturer's facilities.

K. The Contractor shall be responsible for properly transporting all samples, except those taken by testing laboratory personnel, to the testing laboratory.

L. The Contractor shall provide incidental labor and facilities to allow safe and adequate access to Work to be tested, to obtain and properly handle samples at the Site or at source of products to be tested, and to facilitate tests and inspections, storage and curing of test samples.

M. The Contractor shall notify Owner's Representative and laboratory where testing is to be performed 48 hours prior to expected time for operations requiring inspection and testing services.

N. The Owner shall have the discretion to order laboratory testing of any material at any time in the prosecution of the Work.

O. The Contractor shall safe guard all specimens until removed from the site by the test lab.

P. The Contractor shall be responsible for all cost associated with other means or methods of testing deemed necessary due to damaged specimens while in the responsible care of the Contractor

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT AND PAYMENT

A. Testing will be paid “per test” against the Allowance amount included in the Contract.

END OF SECTION

SECTION 01510

SANITARY SEWER MAIN TELEVISION AND INSPECTION (CCTV)

PART 1 — GENERAL

1.01 SECTION INCLUDES

This section includes guidelines and requirements for CCTV Inspection. CCTV inspection identifies structural defects, maintenance concerns, and actual and potential sources of I/I in mainline sewers, service laterals, and manholes. CCTV inspection will also be used to verify installed assessment, cleaning, rehabilitation and/or replacement work as required.

1.02 REFERENCES

A. Codes, Specifications, and Standards - NASSCO – National Association of Sewer Service Companies – Pipeline Assessment Certification Program (PACP) Reference Manual, Version 7.0 or latest version.

B. Manual for Uniform Traffic Control Devices (MUTCD) standards

C. Attachment A – PACP Standard Exchange Database Anticipated Inspection Header Form Attribute Guidance Table (CCTV) (Reference NASSCO PACP Reference Manual, Version 7.0 for related information.

1.03 RELATED SECTIONS

A. Section 01056 – GPS Data Collection

B. Section 01320 - Progress Reports, Video's & Photographs

C. Section 01520 – Sewer Flow Control

D. Section 02607 - Manhole Height Adjustment

E. Section 02956 – Sanitary Sewer Cleaning

1.04 DEFINITIONS

A. Television Inspection: Operation necessary to complete a true-color audio-visual inspection verifying existing internal pipe conditions including pipe materials, pipe grade, connections, cracks, leaking joints, seepage and roots. Contractor shall furnish all labor, materials, equipment, tools, and other incidental services for CCTV.

B. MPEG: MPEG (pronounced M-peg), which stands for Moving Pictures Experts Group, is the nickname given to a family of International Standards used for coding audio- visual information in a digital compressed format. For the purposes of this specification, MPEG shall be defined as an ISO-MPEG Level 4 standard (MPEG- 4)

digital audio-visual coding having a minimum resolution of 500 lines. All video files shall be named using .mpg or .wmv as the file extension.

C. External Hard Drive: For the purposes of this specification, an external hard drive is a peripheral auxiliary device connected to the computer via a high-speed interface cable. The interface cable allows the external hard drive to communicate with the computer so the data may be passed back and forth. The Contractor will deliver all inspection standard exchange databases, digital reports and media to the Owner/Program Manager on an external hard drive compatible with the Owner and Program Manager's equipment and software and will provide adequate storage to contain all deliverables as outlined in the Specifications.

D. Buried Manhole: A manhole where the manhole cover (lid) is not visible at ground surface. Buried manholes usually require removing the material (excluding light dirt and plant material) covering the manhole lid and raising the manhole frame and cover (lid). All buried manholes on the sanitary systems shall be reported for rising following their location discovery by the Contractor (Reference Specification Section 02607). Subsequently, the raised manholes shall be inspected.

1.05 SUBMITTALS

A. Submittals are to be in color PDF format for printed documents as well as other required formats when applicable for digital transfers.

B. Submit one example video on external hard drive of previous sewer inspection work that shows operational and structural defects in sewers, complete with audio commentary and inspection log(s).

1. Videos and inspection logs will be reviewed by Program Manager to determine if quality of CCTV image is acceptable, if defects were properly identified, picture clarity, advancement speeds and lighting are acceptable and documented according to industry standards and the Program Manager's requirements.

2. Modify equipment and/or inspection procedures to achieve report material of acceptable quality.

3. Do not commence Work prior to approval of report material quality by the Program Manager. Upon acceptance, report material shall serve as standard for remaining Work.

C. Records reports shall include a separate report for each pipe segment showing inspection setup data, each defect and locations of laterals, and other coded information. Also, each report shall include photographs of moderate and severe defects. Each report shall also note the labeling number of the corresponding video recording of that pipe segment. The video record of the pipe inspections shall be provided digitally on an approved mass storage device. These records shall include all video information and narrations. The video files shall have a unique name referenced in the PACP inspection database. The file name shall include manhole ID numbers for upstream and then downstream manholes as the start of the file name. It is preferred the direction of the inspection and inspection date be included

as well.

D. Camera specification sheet

E. References: Contact names and telephone numbers

F. List of staff and equipment to be used on this Project

G. Supervisor and field crew leader's contact information including name and mobile telephone numbers

H. Confined space entry certification indicating staff to be used on this project have been properly trained should confined space entry be required

I. Training and inspection plan a minimum of 7 days prior to the first inspection

J. Public notification door hanger based on Program Manager's provided example

K. Inspection (See Documentation Section for additional information)

1. Initial first day's inspections within 24 hours after first day's work is completed.

L. Include the following with each weekly submittal:

1. Inspection media (videos and photographs)

2. Quality controlled Inspection database (PACP Standard Exchange Access Database)

3. Inspection reports (PDF – Digital format)

M. Traffic control plan

N. Quality control plan

1.06 EXPERIENCE

A. Supervisor of the field crews performing these functions shall have the proper training and up- to-date NASSCO PACP certification in these types of equipment and monitoring functions and have a minimum of five (5) years' experience in performing such assignments including safe work practices, etc.

B. Field crew leaders performing these functions shall have the proper training and up to date NASSCO PACP certification in these types of equipment and monitoring functions and have a minimum of two (2) years' experience in performing such assignments including safe working practices, etc.

C. The Contractor shall provide the Owner with written documentation (certification) indicating the supervisor, field crew leader and all crewmembers responsible for these assignments have the proper training and the requisite experience.

D. No crew members shall enter confined spaces without the necessary certified training and permit.

~~**E.** The required experience shall be documented in the Contractor's Invitation to Bid submittal.~~

~~**F.**~~**E.** A PACP certified technician or supervisor shall control operation of television equipment and encoding of inspection. Should Contractor utilize any personnel to actually document the inspection results not PACP certified, those inspections shall be refused and re-survey shall be completely at the Contractor's sole expense.

1.07 RESPONSIBILITY FOR OVERFLOWS/SPILLS AND DAMAGE TO PROPERTY AND UTILITY

A. Reference Specification Section 01030 – Special Project Procedures, Para B.

PART 2 - PRODUCTS

2.01 CCTV PERFORMANCE

A. The Contractor shall furnish the following, but not limited to: the mobile television inspection studio, television camera, sonar, audio-visual digital encoding equipment/software, and other necessary equipment, materials, power, labor, and technicians as needed to perform the television inspection.

B. The surveying/inspecting equipment will be capable of surveying/inspecting a length of sewer up to at least one-thousand five-hundred (1,500) feet when entry onto the sewer may be obtained at each end and up to one-hundred (100) feet by rodding or up to seven-hundred and fifty (750) feet where a self-propelled unit is used, where entry is possible at one (1) end only. This equipment will be maintained in full working order.

C. Each survey/inspection unit will contain a means of transporting the CCTV camera and/or sonar equipment in a stable condition through the sewer under survey and/or inspection. Such equipment will ensure the maintained location of the CCTV camera or sonar equipment when used independently on or near to the central axis of a circular shaped sewer when required in the prime position.

D. Where the CCTV camera and/or sonar head are towed by winch and bond through the sewer, all winches will be stable with either lockable or ratcheted drums. All bonds will be steel or of an equally non-elastic material to ensure the smooth and steady progress of the CCTV camera and/or sonar equipment. All winches will be inherently stable under loaded conditions. The bonds shall be oriented in such a manner as to enable unhindered extension or retraction through the line. All effort shall be made to prevent damage to the pipe during the television inspection. In the case where damage is caused by the Contractor, for any reason, such as would be caused by incorrect deployment of bonds or retrieval of lodged equipment, the cost of repair or remedy shall be borne solely by the Contractor and repaired immediately after notification to the Owner's Representative within 24 hours.

E. Each unit will carry sufficient numbers of guides and rollers such that, when surveying or inspecting, all bonds are supported away from pipe and manhole structures and all CCTV cables and/or lines used to measure the CCTV camera's head location within the sewer are maintained in a taut manner and set at right angles where possible, to run through or over the measuring equipment.

F. Each unit will carry a range of flow control plugs or diaphragms for use in controlling the flow during the survey/inspection. A minimum of one (1) item of each size of plug or diaphragm ranging from the required diameters will be carried. See Sewer Flow Control Specification 01520 for additional details and requirements.

G. Each survey/inspection unit will have on-call equipment available to carry out the flushing, rodding, and jetting of sewers for "Light Cleaning" See the definition of "Light Cleaning" in Sanitary Sewer Cleaning Specification 02956 for details.

H. Television Inspection: The Contractor shall inspect pipelines with pan and tilt conventional television imagery and/or sonar as indicated in the contract documents so as to record all relevant features and defects of the pipeline under inspection. Inspection of pipelines shall be carried out utilizing the Owner approved formats only.

I. External Hard Drive (Videos):

1. Audio portion of videos shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of oral report.

2. Store in upright position with temperature range of 45 to 80 degrees F (7 to 27 degrees C).

3. Identify each hard drive with labels showing Owner's name, Contractor's name, the inspection period, and project area or sewer segments on the hard drive.

J. Hard Drive Titling:

Each segment shown on the external hard drive should have its own video titled with the beginning and end point of the pipe segment.

K. CCTV Camera Head Prime Position:

The CCTV camera head will be positioned to reduce the risk of picture distortion. In circular sewers the CCTV camera lens and/or sonar head will be positioned centrally (i.e. in prime position) within the sewer. In non-circular sewers, picture orientation will be taken at mid-height, unless otherwise agreed, and centered horizontally. In all instances the camera lens head will be positioned looking along the axis of the sewer when in prime position. A positioning tolerance of ± 10% of the vertical sewer dimension will be allowed when the camera is in prime position.

L. CCTV Camera Head Speed:

The speed of the CCTV camera in the sewer will be limited to six (6) inches per

second or 30 ft/min for surveys. Similar or slightly higher speed may be used on a case-by-case basis. Stop for a minimum of five (5) seconds at every lateral, defect, or adversity. The speed of scanning sonar will be limited to four (4) inches per second.

M. CCTV Color Camera:

The television camera used for the pipe line inspection shall be one specifically designed for hazardous and corrosive environments and constructed for pipeline inspection. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall adhere to the following requirements:

1. Waterproof and shall be operative in 100% humidity conditions with lens fogging and any conditions that may be encountered in the inspection environment.

2. Self-leveling, color pan and tilt camera(s) to facilitate the survey and inspection of all laterals, including defects such as hydrogen sulfide corrosion in the soffit of sewers and benching or walls of manholes over and above the standard defects that require reporting.

3. A three-hundred sixty (360) degrees rotational scan indicating general condition must be implemented at every fifty (50) feet interval (min.) along sewers, and at manholes and any salient, specified, defect features.

4. The tilt arc must not be less than two-hundred seventy (270) degrees with adjustable supports designed for operation in connection with pipe inspection with a viewing angle of not less than 65 degrees.

5. The view seen by the television camera shall be transmitted to a monitor of not less than 11 inches in size.

6. The travel speed of the television inspection camera (through the pipe) shall be uniform and shall not exceed the maximum speed herein specified.

7. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the Program Manager; and if unsatisfactory, equipment shall be removed and no payment will be made for an unsatisfactory inspection.

8. The adjustment of focus and iris will allow optimum picture quality to be achieved and will be remotely operated.

9. The adjustment of focus and iris will provide a minimum focal range from six (6) inches in front of the camera's lens to infinity.

10. The distance along the sewer in focus from the initial point of observation will be a minimum of twice the vertical height of the sewer.

11. The illumination must be mounted on and turned in the direction of the camera such as to allow an even distribution of the light around the sewer perimeter without the loss of contrast picture, flare out, or shadowing, light sensitivity to be greater than 1.5 lux minimum, minimize reflective glare, remote variable intensity control, provide a clear in-focus picture of entire inside periphery of pipe and the ability to achieve proper balance of tint and brightness.

N. Color CCTV :

All CCTV and/or sonar work will use color CCTV reproduction. CCTV Side Scanning Camera:

The Owner's Representative will consider high resolution digital CCTC side scanning cameras if proposed by the Contractor. The Program Manager may not accept the side scanning camera use for this project if the contractor cannot provide supporting documents showing previous successful application.

O. The survey/inspection vehicle for general public streets or assessable locations will comprise two (2) distinct separate areas. One (1) of these, designated as the viewing area, will be insulated against noise and extremes in temperature, include the provision for air conditioning, and will be provided with means of controlling external and internal sources of light in a manner capable of ensuring that the monitor screen display is in accordance with the requirements of this specification. Seating/and or space accommodations will be available to enable additional workers to clearly view the on-site monitor, which will display the survey/inspection as it proceeds.

P. The working area will be reserved for equipment, both operational and stored, and no equipment utilized within the sewer will be allowed to be stored in the viewing area.

Q. The vehicle will be suitable for carrying the survey team and laborers and the equipment necessary to safely perform the work.

R. Off road inspection equipment/easement machine proposed by the Contractor shall be reviewed and approved by the Program Manager before the Contractor utilizes said equipment.

PART 3 - GENERAL

3.01 EXECUTION

A. The following guidelines concerning the use of CCTV will be followed:

1. Generally, CCTV alone will be used for internal condition assessment where the depth of flow is less than twenty-five (25%) percent of overall sewer volume at the start of the survey. If the flow volume is greater than 25%, as agreed

upon by the DWM representative, bypass pumping may be required and paid for according to Section 01520

B. Confined Space Entry: Crews shall minimize the physical entry into manholes. Manhole entry shall be performed in accordance with Federal, State, Local and any other regulations for confined space entry. Only trained crews and staff may perform confined space entry after obtaining an entry permit. Staff must use safety required equipment, including harnesses, ventilation equipment, etc.

C. The Contractor shall make map verifications and record and deliver GIS map corrections as necessary (Refer to Section 01056).

D. Traffic Control: The work area shall be protected at all times with an adequate number of cones, barricades, flags, certified flaggers, and other measures necessary to meet the Manual for Uniform Traffic Control Devices (MUTCD) standards and to properly and safely protect both vehicular and pedestrian traffic. Flagmen shall work to secure all affected streets. Further requirement for traffic control may be imposed by the specific agency having jurisdiction. All traffic control measures shall comply with the requirements of MUTCD, Part 6 – Temporary Traffic Control, Latest Edition as published by USDOT/FHWA.

E. Site Security: Wear all required safety equipment, such as safety vests, hardhats, safety glasses, and steel toe boots. Follow all applicable state and local traffic safety procedures. Alert the closest fire department/Emergency Medical Services (EMS) as to the location of the day's work and to stand by for emergencies.

F. Scheduling Time: Crews shall begin inspections after 8:00 am and terminate inspections no later than 5:00 pm each day unless otherwise directed by the Program Manager in order to address localized special requirements. Authorization should be obtained if work is to be performed outside of the designated hours. Work should be performed by the Contractor in time frames complying with the County's noise ordinance.

G. Permits for Rights of Ways & Contract Utility Licensing: The Contractor shall obtain work permits for all work to be performed in State and/or County Right of Ways. The Contractor shall also plan for all other insurances, traffic control measures, and other terms of the permit in advance. The Contractor shall also obtain all necessary and applicable licensing.

H. Sequence of Work:

1. Perform Work in the following sequence:

    a. Clean sewer lines and manholes in accordance with "Light Cleaning" requirements of Section 02956, Sanitary Sewer Cleaning.

    b. Contractor shall remove debris in accordance with guidance in Section 02956, Sanitary Sewer Cleaning.

    c. After cleaning, the manhole sections shall be visually inspected by means of CCTV. The inspection then will be done one linear section at a time and the flow in the section being inspected will be suitably controlled as

specified (see Sewer Flow Control Specification Section 01520). All CCTV inspections shall be performed in accordance with PACP standards including the specific date and time of inspection.

I. Inspection equipment shall utilize software capable of providing complete survey reports, inspection standard exchange database, and linked media files; equipped with modules necessary for NASSCO Pipeline Assessment and Certification Program inspection.

J. If television inspection of an entire manhole to manhole sewer segment cannot be successfully performed from one manhole, a reverse setup shall be performed to obtain a complete inspection. A reverse setup shall be considered incidental to and included in the segment's unit price bid for CCTV inspection. If upstream (reverse) setup, is required, establish new inspection run separate from downstream (normal) setup so two inspection records exist in the software, one with the normal setup and one with the reverse setup.

K. Televised pipe segment inspection is represented by one manhole-to-manhole pipe segment or other structural access-to-access point; not multiple manhole-to-manhole segments.

L. Show continuous footage reading and other required information on inspections image. Place on screen where it is clearly visible (if black font, do not place on dark background, if white font, do not place on light background).

M. Viewing shall be in direction of flow, except while camera is being used in a reverse setup. Inspection shall proceed from upstream to downstream, unless prohibited by obstruction.

N. Keep camera lens clean and clear. If material or debris obscures image or causes reduced visibility, clean or replace lens prior to proceeding with recording operation.

O. Camera lens shall remain above visible water level and may submerge only while passing through clearly identifiable line sags or vertical misalignments. If flow exceeds 25 percent of diameter and the camera lens becomes obscured, pause inspection until flow subsides. If necessary, reschedule CCTV operation. Surcharging and flooding of camera lens is not an excusable condition if it has been artificially created upstream, i.e., placement of flow plugs or freshwater flushing in pipe.

P. Pan the camera to record the inside of each lateral or connecting pipe and the connection of lateral or connecting pipe to sewer pipeline.

Q. Recordings shall clearly show all defects and observations, and their severity in addition to obvious features, i.e., laterals and joints.

R. Immediately report to Program Manager any obstructions restricting flow and causing inspection to be interrupted. Assure the obstruction is documented in the inspection with the appropriate defect code. Document condition with still photographs, and begin a reverse inspection setup or inspections of other pipelines

to the satisfaction of the Program Manager.

S. Televise pipe segments from manhole to manhole on same video in continuous run.

1. Video shall clearly show camera starting and ending at manhole, unless defects do not allow it.

2. Do not perform partial televising on one video and then complete run on another video.

3. If line is partially televised, due to excusable condition, i.e., collapsed line, televised length shall be viewed by the Program Manager.

4. If a portion of the Contractor's inspection is unacceptable to the Owner or Program Manager, the entire pipe segment shall be deemed unacceptable and the Contractor shall re-televise the entire pipe segment at the Contractor's sole expense.

T. The Owner or Program Manager may, on occasion, accept a physical inspection not adhering to minimum standards if adverse conditions are encountered and re-inspection is not advised.

3.02 CCTV INSPECTION

A. Data Transfer: Upon completion of CCTV inspection, transfer inspection data to an external hard drive (HD) of sufficient capacity and compatibility with Owner's and Program Manager's equipment and available programs; include code required for proper playback of video file.

B. Labeling: Provide printed label on outside of HD that indicates the following:

1. Name of owner

2. Project title

3. Date of submittal

4. Inspection company

5. Deliverable number

6. Project assignment area (provided by Program Manager)

C. Media:

1. Video:

   a. Inspections completed, with a unique filename per manhole to manhole pipe segment inspection.

   b. Continuous digital video recordings of the inspection view as it appears on the television monitor shall be taken. The recording shall also be used as

a permanent record of defects.

c. The recording shall be MPEG-4. Separate MPEG-4 files shall be created for each pipe. In case of a reverse setup, such inspection shall be stored in a separate inspection record and MPEG file. MPEG files shall be written to External Hard Drive media for delivery to the Program Manager.

d. MPEG files shall be named according to the following file specification:

TV_[PIPEID]_[Direction]_[MMDDYYYY]_[Incremental Number].mpg

e. The incremental number shall be used if multiple inspections are performed for the same line, such as a reverse inspection setup.

f. The Owner, at its sole discretion, reserves the right to refuse any MPEG, on the basis of poor image quality, excessive bit rates, inconsistent frame rates or any other characteristics that may affect usability by the Owner.

g. The digital video encoding shall include video information that can be reproduced with a video image equal or very close to the quality of the original picture on the television monitor. The replay of the recorded video information shall be free of electrical interference and shall produce a clear, stable image.

2. Audio:

a. Embedded in video file

b. Operator will include description of inspection setup, including related information from log form and unusual conditions.

c. Operation changes (for example, remove roots and restart inspection at footage prior to root removal)

d. Verbal description and location of each defect

e. Verbal description and location of each service connection

D. Still Photographs:

1. Provide color digital photographs showing inspection image whenever observation or defect has a moderate or major severity; looking into a lateral or connection pipe; or unless otherwise instructed by the Owner or Program Manager;

2. Each with a unique filename matching the asset ID with a random number;

3. Encoded in .JPEG format;

4. Minimum 1024 x 768 resolution; and

5. Provide label on front of photograph with structure identification number, footage (if not visible on photograph), and defect code (if applicable).

E. Database:

1. Include all inspections in a single consolidated PACP Version 6 or newer Access Standard Exchange database. Creating a database per inspection is not acceptable. Each submittal standard exchange database shall be cumulative containing all prior inspections as well as inspections conducted during interim period since previous submittal.

2. Prior to the start of the Work, provide PACP standard exchange database of collected data including anticipated inspection header field attribute information. A PACP Inspection Header Guidance Table will be provided upon request.

3. File Type: MS Access, .MDB, .ACCDB

4. Database Format: PACP Version 6 or newer. NASSCO PACP data will be exported into Standard PACP Standard Exchange database.

5. List inspection media names in corresponding asset/inspection/defect information field within database.

F. Linear Measurement:

1. The CCTV monitor display will incorporate an automatically updated record in feet and tenths of a foot of the footage of the camera or center point of the transducer, whichever unit is being metered, from the cable calibration point, the pipe diameter (physical measurement by Contractor), and verified pipe material. The relative positions of the two (2) center points will also be noted.

2. The Contractor shall use a suitable metering devise enabling the cable length to be accurately measured; this shall be accurate to 0.20 feet. The Contractor shall use the footage readings to identify location of defects to the nearest 0.10 feet. Measurement shall be zeroed after each segment inspected. The Contractor shall calibrate the footage meter on a regular basis and demonstrate that the tolerance is being achieved by tape measurement between manholes on the surface. This taped measurement must be included on a quality control form which will be completed and submitted by the Contractor depicting the level of accuracy achieved.

G. Data Display, Recording and Start of Survey/Inspection:

1. At the start of each sewer length being surveyed or inspected and each reverse set-up, the length of pipeline from zero (0) footage, the entrance to the pipe, up to the cable calibration point will be recorded and reported in order to obtain a full record of the sewer length. Only one (1) survey will be indicated in the final report. All reverse set-ups, blind manholes, and buried manholes will be logged on a separate log. Video digits will be recorded so every recorded feature has a correct tape elapsed time

stamp. Each log will make reference to a start and finish manhole unless abandonment took place because of blockage.

2. The footage reading entered on to the data display at the cable calibration point must allow for the distance from the start of the survey/inspection to the cable calibration point such that the footage at the start of the survey is zero (0).

3. In the case of surveying through a manhole where a new header sheet and file must be created, the footage will be set at zero (0) with the camera focused on the outgoing pipe entrance.

4. At the start of each manhole length a data generator will electronically generate and clearly display on the viewing monitor and subsequently on the video recording a record of data in alpha-numeric form containing the following minimum information:

    a. Automatic update of the camera's footage position in the sewer line from adjusted zero (0)

    b. Sewer dimensions

    c. Manhole/pipe asset ID number

    d. Date of survey

    e. Road name/location

    f. Direction of survey

    g. Time of start of survey

    h. Sewer use (SS - Sanitary Sewer)

    i. Material of construction of the pipe

    j. The size and position of the data display will be such as not to interfere with the main subject of the picture.

5. Once the survey of the pipeline is under way, the following minimum information will be continually displayed:

    a. Automatic update of the camera's footage position in the sewer line from adjusted zero (0).

    b. Manhole or pipe asset ID number.

    c. Defect/observation code(s) (temporarily display when encountered)

    d. Date and time

6. Before camera enters the pipe, inspection shall provide video of the manhole. Video recording shall begin by facing pipe segment to be televised and then pan/tilt/zoom as necessary to point camera up toward the manhole opening.

H. Coding: Defect Coding, as well as material, shape, and lining coding, and conventions used will comply with PACP formats and will be compatible with the Owner's GIS.

3.03 MAN ENTRY SURVEY

A. Photographic Camera Position - General Illustration of Sewer Interior:

1. The hand-held photographic camera or CCTV camera will be positioned to reduce the risk of picture distortion. In circular sewers the camera lens will be positioned centrally looking along the axis of the sewer. In non-circular sewers picture orientation will be taken at mid-height, unless otherwise agreed, and centered horizontally.

2. The hand held photographic camera or CCTV camera will be positioned so the long side of the photograph or CD-ROM frame is horizontal.

B. Photographic Camera Position - Laterals/Specific Defect: A means of accurately locating the photographic or camera's footage and any recorded lateral or defect, along the sewer will be provided, to an accuracy of ± 1% or six (6) inches, whichever is greater.

C. Photographic Quality: The in-sewer photographic camera or hand held CCTV system and suitable illumination will be capable of providing an accurate, uniform and clear record of the sewer's internal condition.

3.04 DELIVERABLES

A. Digital PACP Standard Exchange database shall be submitted on external hard drive in duplicate to the Program Manager. The database must contain all the data required by this specification.

B. Final Television Inspection Reports shall be submitted to the Program Manager in PDF on the same external hard drive referenced above. Corresponding MPEG videos and photos shall also be submitted to the Program Manager as outlined by this specification.

3.05 PUBLIC NOTIFICATION – CCTV INSPECTION

A. Public notification is critical and compliance with the public notification criteria is a prerequisite for CCTV inspection, especially when conducting inspections on sewers in easements passing through private property. Notification must be provided to all property occupiers/owners likely to be affected including residential, commercial and institutional (schools, hospitals, nursing homes, etc.). At a minimum, the following steps shall be taken:

1. The Contractor shall print and distribute pre-approved advance notice door hangers 72 hours before conducting CCTV inspection. The Contractor shall distribute the door hangers to the property owners (residential, commercial and institutional) in the affected area(s).

2. The advance notice door hangers shall be customized by Public Outreach to suit this project and will be provided to the Contractor for printing prior to project commencement. If CCTV inspection is delayed, the Contractor must re-distribute door hangers.

3. The Contractor is responsible for distributing pre-approved "Right-of-Entry" (ROE) forms and securing signatures from affected property owners on the ROE forms prior to conducting CCTV inspection.

B. The Contractor shall keep a daily log of the distribution of the door hangers. This shall be maintained and submitted to the Owner and/or Program Manager upon request.

C. The Contractor shall alert the appropriate Owner and Program Manager personnel of their work locations on a daily basis.

D. Contractor will provide and place "Right-of-Way" signs in prominent locations where CCTV is planned 24-hours in advance of commencing the inspection. Signs will be a minimum of 24 inches wide by 18 inches high with letters a minimum of 2 inches high. Signs will be supported a minimum of 12 inches above grade by integral metal frames. Wording on the signs shall be similar to the following:

CCTV INSPECTION WILL BE CONDUCTED ON "date" and "time." Contact "person" with "company" at "phone number" for additional information.

3.06 QUALITY ASSURANCE/QUALITY CONTROL

A. Data Quality Control Procedure:

1. The Contractor shall perform a Quality Control (QC) check of the televised inspection documentation using the QC database provided by the Program Manager.

2. The Contractor shall correct any data conflict, missing data, or other questionable entry identified by the conflict, missing data, or other questionable entry identified by the QC reports prior to submitting the CCTV inspection data to the Program Manager.

B. The Contractor shall establish and perform a QA/QC analysis addressing all video and data recorded before the data is submitted to the Owner/Program Manager. The Program Manager will periodically request the Contractor to review the QC results with the Program Manager.

C. The data submissions shall undergo the same random review checks for Quality when submitted to the Owner/Program Manager. Should accuracy or qualitative levels fall below those deemed acceptable to the Program Manager, the data

submittal will be refused and no payment will be released. Contractor will be required to correct or re-do inspections until the Program Manager is satisfied with the work.

3.07 DOCUMENTATION

A. The Contractor shall complete work on each asset as described herein. Refer to the Measurement and Payment Section (Section 01025) for documentation required with each pay request.

B. Measurement Units: All dimensions will be in feet and inches. Sewer measurement will be to the nearest inch.

C. CCTV and Man-Entry Photographs: Photographs will be taken of all laterals or connecting pipes and moderate or severe pipeline defects. Where a defect is continuous or repeated the photographs will be taken at the beginning of the defect and at not less than ten (10) foot intervals thereafter.

D. The Contractor shall complete weekly and end of work television/inspection reports as described herein. These reports shall be per the format and defect codes of NASSCO's Pipeline Assessment and Certification Program (PACP). Prior to beginning work, the Contractor shall submit a digital sample of the television inspection report to the Program Manager for approval.

END OF SECTION

SECTION 01520

SEWER FLOW CONTROL

PART 1 — GENERAL

1.01 SECTION INCLUDES

The purpose of this section is to define the various methods of wastewater flow control including plugging/blocking and bypass/diversion pumping. Wastewater flow control shall maintain an efficient and uninterrupted level of service to the sewer system while performing investigative or construction operations.

1.02 RELATED SECTIONS

A. Section 01300 – Submittals

B. Section 01510 – Sanitary Sewer Main Television and Inspection

C. Section 02900 – Sanitary Sewer Manhole Rehabilitation

D. Section 02500 – Lining With Cured-In-Place Pipe (CIPP)

E. Section 02501 – Lining with Ultra Violet Fiberglass Cured-in-Place Pipe

F. Section 02520 – Internal Point Repairs with CIPP

G. Section 02535 – Gravity Flow Sanitary Sewers

H. Section 02956 – Sanitary Sewer Cleaning

I. Section 02958 – Pipe Bursting

1.03 REFERENCES

A. ASTM D1238 - Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer

B. ASTM D1248 - Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable

C. ASTM D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique

D. ASTM D1693 - Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics

E. ASTM D2122 - Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

F. ASTM D2657 - Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings

G. ASTM D2837 - Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products

1.04 SUBMITTALS

A. Prior to any bypass/diversion pumping activity the Contractor shall submit the complete and detailed bypass pumping plan to the Owner's Representative's for review and approval as required of Section 01300, Submittals.

B. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction. The Contractor may submit a general bypass/diversion pumping plan to be used when bypassing sewer mains smaller than 12-inch diameter. Once the Contractor has received written approval from the Owner's Representative for the smaller than 12-inch sewer main plan, the Contractor may use the plan without re- submittal. The contractor is completely responsible for the design, installation and operation of an effective bypass system. The Owner's Representative's review is for general conformance only and does not relieve the Contractor of any responsibility.

C. For bypass plans associated with 12-inch or larger sewer mains, a Georgia certified Professional Engineer must sign and seal the bypass/diversion plan.

D. The bypass/diversion pumping plan submittal, regardless of pipe size, shall have sufficient detail to show the following at a minimum:

1. Lowest overflow point upstream of the bypass/diversion.
2. Pump stations upstream of the bypass/diversion.
3. Staging area for pumps.
4. Sewer plugging method and types of plugs.
5. Number, size, material, location and method of installation of suction piping and required protection against any potential for vortexing.
6. Number, size, material, location and method of installation of discharge piping.
7. Bypass pump sizes, capacity, number of each size to be onsite and the power requirements, including standby equipment that must also be on site.
8. System curve design calculations detailing the static lift, friction losses, velocity losses and flow velocities.
9. Pump curves with the system curves plotted showing the pump operation range and confirming the pump size, horsepower and impeller required.

10. Standby power generator size and location, if utilized.

11. Noise control and abatement measures.

12. Downstream discharge plan including pipe routing plan and profile views.

13. Sections showing suction and discharge pipe depth, embedment, joint restraints, thrust blocking and backfilling.

14. Method of protecting discharge manholes or structures from erosion and damage.

15. Location and position, in detail, where pipes cross roadways and driveways.

16. Traffic Control Plan, if applicable.

17. The plan should take into account the potential for wet weather with flow calculations adjusted accordingly.

18. Identification Personnel committed solely to monitoring the bypass system including but not limited to bypass pumps, discharge lines, related pump stations, manhole levels, etc. This monitoring shall be conducted continuously until the bypass system is no longer needed.

E. The Contractor will provide an emergency response plan for each bypass/diversion pumping. The plan shall address at a minimum, protocol for Owner contact, emergency 24-hour contact names and numbers including responsible contractor personnel and vendor emergency numbers, containment and clean up procedures, backup equipment and materials that will be on site, monitoring responsibility and all other information required by the Owner's Representative. The plan will be followed in the event of failure of the bypass/diversion pumping system.

F. The Contractor must identify all pump stations and the lowest overflow point upstream of the plugging/block and/or bypass/diversion pumping. The Contractor may be required, at no additional cost to the Owner, to station personnel at upstream pump stations and overflow points.

G. The Contractor shall notify the Owner's Representative a minimum of 48 hours prior to commencing any plugging/block and/or bypass/diversion pumping.

H. The Contractor shall complete a daily written record (diary) detailing the work carried out and any small items of Work incidental to the Work. The Contractor shall include in his daily record and reference to the following:

1. Delays: Dense traffic, lack of information, sickness, labor or equipment shortage, etc.

2. Weather: Conditions (e.g., rain, sunny, windy, etc.).

3. Equipment: On site including size, model, number (e.g., specialty cleaning, by- pass equipment, etc.).

4. Submittals: To the Owner's Representative's.

5. Personnel: On site by name, trade, hours on site (e.g., all labor, specialty services, etc.).

6. Accident: Report (e.g., all injuries, vehicles, etc.).

7. Incident: Report (e.g., damage to property, property Owner's complaint, etc.).

8. Major defects encountered: including collapsed pipe, if any, cave-ins, sink holes, etc.

9. Visitors: On site.

10. Disposals: Type and quantity of debris (including liquids).

11. Daily Work: Work attempted and work accomplished.

1.05 EXPERIENCE

A. The Contractor shall provide the Owner's Representative with written documentation acknowledging the supervisor and field crew leaders responsible for this work have received the proper training, are certified, and have the requisite experience. This documentation will include dates of hands-on experience, employer, description of duties/experience, 24-hour contact name and phone number along with pumping vendor contacts, experience and a written commitment to 24-hour emergency service. Documentation on any person shall not be longer than one (1) page.

B. Supervisor of the field crews must be properly trained in this function ~~and have a minimum of three (3) years' experience in performing successful gravity sewer bypass/diversion pumping~~, to include safe working practices for the types of equipment and operation of the equipment used for this contract.

C. Field crew leaders must be properly trained in the function and have a minimum of two (2) years hands-on experience in performing successful bypass/diversion pumping, to include safe working practices for the types of equipment and operation of the equipment used for this contract.

D. No crewmembers shall enter confined spaces without the necessary certified training.

1.06 PERSONNEL

A. The Supervisor must visit the project site daily, checking on their personnel and subcontractors, meeting with the field crew leaders, as well as checking on the status and progress of the project.

B. A field crew leader must be with their crew when their crew is working. Each field crew leader can only have one crew. Each crew must have its own field crew leader; this includes when the requirements call for 24-hour monitoring.

1.07 RESPONSIBILITY FOR SANITARY SEWER OVERFLOWS AND DAMAGE TO PROPERTY AND UTILITY

A. Reference Specification Section 01030 – Special Project Procedures

PART 2 - PRODUCTS

2.01 PIPE FOR FLOW DIVERSION

A. Ductile Iron Pipe: Ductile iron pipe, as specified in DeKalb County Design Standard for Ductile Iron Sanitary Sewer Pipe and Fittings, is acceptable for use for flow diversion during construction.

B. High Density Polyethylene Pipe (HDPE) is permitted for flow diversion. Polyethylene material shall comply with the requirements for Type III polyethylene, C-5 and P-34 as tabulated in ASTM D-1248 and has the Plastic Pipe Institute recommended designation PE3406. The material shall also have an average specific base resin density of between 0.94 g/cc and 0.955 g/cc (ASTM D-1505). Pipe made from these resins must have a long-term strength (50 years) rating of 1,250 psi or more per hydrostatic design basis categories of ASTM D-2837. The polyethylene resin shall contain antioxidants and be stabilized against ultraviolet degradation to provide protection during processing and subsequent weather exposure. The polyethylene resin shall have an environmental stress crack resistance condition C, as shown in ASTM D-1693, to be greater than 500 hours, 20% failure. All pipes shall be made from virgin quality material. No rework compound, except when obtained from the manufacturer's own production of the same formulation shall be used. The polyethylene resin shall have an average melt flow index, condition E as shown in ASTM D-1238, not in excess of 0.25 g/10 mm. Pipe shall be homogeneous throughout, and free of visible cracks, holes, foreign material, blisters, or other deleterious faults. Diameters and wall thickness shall be measured in accordance with ASTM D-2122. Pipe joining will be done by thermal butt fusion method in accordance with ASTM D-2657.

C. Polyvinylchloride (PVC) pipe is permitted for flow diversion. PVC pipe shall be rigid and securely coupled with a minimum number of connections. Glued PVC is not allowed.

D. Lay flat hose is permitted for use with 2" and 3" gas powered portable pumps, and must be in like new condition free of damage, leaks or other unacceptable conditions. Use of lay flat hoses across roadways is prohibited.

E. Irrigation type piping is not allowed.

F. No more than two (2) pump discharge hoses will be allowed at any given time. The length of these hoses shall be limited at the direction of the Owner's Representative or as indicated in the approved by-pass pumping plan. The Contractor, at a minimum, shall design all piping, joints and accessories to withstand twice the maximum operating pressure or 100 psi whichever is greater.

G. If required, the Contractor must provide air relief (air relief valves, etc.) on bypass/diversion pumping discharge piping to insure proper operation.

H. All pumps used shall be fully automatic self-priming units and do not require the use of foot-valves or vacuum pumps in the priming system. The pumps may be electric, gas, or diesel powered, provided they meet all specified sound level requirements. If electric pumps are used, the combined generator/pump system shall meet the specified sound level requirements. All pumps used shall be constructed to allow dry running for long periods of time to accommodate the cyclical nature of effluent flows.

I. Maintain sufficient equipment, materials and personnel on site to monitor the system and ensure continuous and successful operation of bypass and dewatering systems.

1. Keep standby pumps on site, fueled and operational at all times.

2. Maintain sufficient number of valves, tees, elbows, connections, tools, sewer plugs, piping, and all other necessary parts or system hardware on-site to ensure immediate repair or modification of any part of system as necessary.

J. Unless specified otherwise in these Specifications or approved by the Owner's Representative, all pumps (and generators if used) shall be fully sound attenuated and shall produce a noise level of sixty-five (65) dB or less at a distance of twenty- three (23) feet.

K. The Contractor shall provide the necessary stop/start controls for each pump.

PART 3 - EXECUTION

3.01 GENERAL STANDARDS AND REQUIREMENTS

A. Prior to commencing each bypass/diversion pumping activity the Contractor must receive written approval from the Owner's Representative.

B. Ensure all levels of sewage flow are continuously monitored and effectively handled.

C. The back-up pump, appropriate piping, fuel, lubrication and spare parts shall be incorporated into the bypass/diversion pumping arrangement at the site, ready for use in case of a breakdown.

D. At no cost to the Owner, the Contractor will carry out a "trial run" of the bypass/diversion arrangement on all sewers greater than 12-inches. This trial run must be conducted before the Owner's Representative will accept the arrangement. The "trial run" shall demonstrate the incorporation of all standby equipment to handle flows when the main pump set is switched off. The "trial run" shall be performed using c*lean* water. Additionally, the Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping using *clean* water prior to the actual operation. The pressure and leakage test shall be conducted at one-and-a-half times the maximum pressure the system will experience based on the approved Bypass Pumping Plan for a period of two hours.

E. All materials used for bypass/diversion pumping shall be pre-approved by the Owner's Representative prior to commencing pumping activities. Materials later determined to be unacceptable shall be replaced with acceptable materials at no additional cost to the Owner.

F. When wastewater flows at the upstream manhole of the sewer main being televised are above the maximum allowable requirements for television inspection, or do not allow the proper sewer or manhole repair, the flows shall be reduced to the levels required by one of the following methods: plugging/blocking or bypass/diversion pumping of the flows, as approved by the Owner's Representative.

G. In some applications, the wastewater flow may be plugged/blocked and contained within the capacity of the collection system. This shall only be done when it has been determined by the Contractor and approved by the Owner's Representative the system can accommodate the surcharging without any adverse impact to the system or customers.

H. When a sanitary sewer is being rehabilitated or replaced, the Contractor shall provide notification to all Property Owner's forty-eight (48) hours in advance of planned downtime for public and private service laterals connected to or served by the sewer main being rehabilitated or replaced. Downtime for all private or public service laterals is not to exceed six (6) hours.

I. During construction, flows in sections of the existing sewer being rehabilitated by removal and replacement shall be accommodated by plugging/blocking or bypass/diversion pumping.

J. The plan must keep the wastewater flowing without discharge or spills into any storm sewers, adjacent creeks or on to the ground. No bypassing to ground surface, receiving waters, storm drains, or bypassing resulting in groundwater contamination or potential health hazards shall be permitted. The Contractor will seek and obtain inspection and testing approval of each section of newly laid sewer before removing the flow diversion from service and placing the newly installed or rehabilitated section into service.

K. In sections of the existing sewer being rehabilitated by laying a new line parallel to the existing sewer, the existing sewer may be used to accommodate the existing flow, and no bypass/diversion pumping will be necessary if the existing sewer is not damaged or otherwise unsuitable for effective use or its use restricted by the Contractor's operations.

L. All pipe materials utilized in wastewater flow control shall be in like new condition, and free of defects, and leaks. The Contractor, at no cost to the Owner, shall replace any defective material. Upon completion of the job, wastewater flow control materials shall be removed from the site.

M. Before any wastewater flow control equipment is installed, the Contractor shall de-silt the segment of sewer to be bypassed while it is still under flow. Subsequent jetting and final cleaning before inspection or repair shall be undertaken while the segment of sewer is bypassed.

N. The Contractor is responsible for locating any existing utilities in the area the Contractor selects to locate the bypass pipelines. The Contractor shall locate his bypass pipelines to minimize any disturbances to existing utilities and shall obtain approval of the pipeline locations from the Owner's Representative. All costs associated with relocating utilities and obtaining all approvals shall be paid by the Contractor.

O. During all wastewater flow control operations, the Contractor shall protect manholes and all local sewer lines from damage inflicted by any equipment. The Contractor shall be responsible for all physical damage to mainlines, manholes, and all local sewer lines caused by human or mechanical failure.

P. The Contractor shall complete all wastewater flow control activities with the minimum sound level compatible with the herein specified noise levels for temporary pumping systems.

3.02 DEPTH OF FLOW

A. In performing television inspection (without sonar), joint testing, and/or sealing and other sewer rehabilitation work, the Contractor shall control the depth of flow in the sewer within the following guidelines:

Maximum Pipe Flow Depth

TELEVISION INSPECTION		JOINT TESTING AND SEALING	
Pipe Size	% Pipe Dia.	Pipe Size	% Pipe Dia.
6"-12"	25	6"-12"	20
15"-24"	25	15"-24"	25
27" or larger	25	27" or larger	30

B. When sewer line flows, as measured in the first manhole upstream of the sewer segment being inspected or rehabilitated, exceed the maximum depth listed above or inspection of the complete pipe periphery is necessary for effective testing, sealing, or line work, the Contractor shall implement wastewater flow control methods. The implementation of the flow control method shall be reviewed and approved by the Owner's Representative.

3.03 PLUGGING AND BLOCKING

A. The Contractor shall insert a sewer line plug into the line at a manhole upstream from the section being inspected or repaired. The plug shall be so designed so all or any portion of the flow can be released. Plugs should be secured to manhole to prevent movement downstream. Flows shall be shut off or reduced and continuously monitored to within the maximum flow limits specified. Wastewater flow shall be restored to normal following completion of work.

B. No Plumbers plugs will be allowed.

3.04 BYPASS/DIVERSION PUMPING

A. When bypass/diversion pumping is required, a pump size shall be determined by the Contractor. The Contractor shall supply the necessary pumps, conduits, and other equipment to effectively divert the flow of wastewater around the sewer section where the work is to be performed. The bypass system shall have sufficient capacity to handle existing flows plus additional flow potentially occurring during periods of rainstorms as indicated from the flow monitoring program. The Contractor shall be responsible for furnishing the necessary labor and supervision to set up, monitor and operate the pumping and bypassing system. A "setup" consists of the necessary pumps, conduits, and other equipment required to divert the flow of wastewater from the start to finish of work performed.

B. Wastewater shall be pumped directly into the nearest available downstream manhole, provided the existing sewer has the capacity to transport the flow. The Contractor shall request the Owner's Representative to determine the capacity of the downstream existing system. The Contractor shall request this determination a minimum of fourteen (14) calendar days prior to the planned bypass/diversion pumping.

C. The Contractor shall be responsible for monitoring and keeping the pumps running continuously 24 hours a day, if required, until the bypass operation is no longer required. The Contractor shall have standby pumps on site along with all necessary supporting materials, accessories, fuel and personnel at all times.

D. Bypass pumping systems shall have sufficient capacity to pump peak flows in the pipes being bypassed (flows in the existing interceptor sewers can increase dramatically during periods of wet weather). The Contractor shall provide all pipeline plugs, pumps of adequate size to handle wet weather peak flows, and temporary discharge piping to ensure the total flow of the interceptor sewer is safely diverted around the section to be repaired. Wastewater flow control system will be required to be operated and monitored twenty-four (24) hours per day.

E. Maintenance personnel capable of starting, stopping, refueling, and maintaining the pumps and equipment during the bypass/diversion pumping operation shall continuously monitor pumps and equipment. If pumping is required on a 24-hour basis, engines shall be equipped in a manner to keep noise within limits specified herein.

3.05 FLOW CONTROL PRECAUTIONS

A. Where the wastewater flow is plugged/blocked, the Contractor shall be responsible for taking all necessary precautions to protect public health. The sewer lines shall also be protected from damage. The following shall apply:

1. No wastewater shall be allowed to back up into any homes or buildings.

2. No wastewater shall overflow any manholes, cleanouts, or any other outlet.

3. Customers upstream of the flow control area shall be able to use all their water and sewer utilities without interruption.

4. If any of the above occur or are expected to occur, the Contractor shall provide bypass pumping or flow diversion top alleviate all of the conditions and perform response as stipulated per the Consent Decree. Additionally, the Contractor shall continuously monitor and observe the conditions upstream of the plug and be prepared to immediately start bypass/diversion pumping, if needed.

B. Any sump pumps, bypass pumps, trash pumps, or any other type of pump, pulling wastewater or any type of material out of the manhole or sewer, shall discharge the material into another manhole, or appropriate sealed vehicle or container approved by the Owner's Representative. Under no circumstances shall this material be discharged, stored, or deposited on the ground, swale, road, or open environment.

C. The removal of excavated materials that contain, or are contaminated by sewage, including but not limited to spoil materials, pipe, debris, portions of manholes etc. shall be discharged into appropriate sealed vehicles or containers and not placed on the ground, swale, road, or open environment.

D. The Contractor shall take appropriate steps to ensure all pumps and piping carrying raw wastewater are protected from traffic. Traffic control shall be performed in accordance with the requirements of the governing agency.

E. Prior to any wastewater flow control operations, the Contractor will identify the pump station/s and lowest overflow point upstream of the planned plugging/blocking or bypass/diversion. During operations the Contractor will continuously monitor the pump stations and lowest points to ensure overflow does not occur.

F. In the event, during any form of "Sewer Flow Control," raw wastewater is spilled, discharged, leaked, or otherwise deposited in the open environment, the Contractor shall immediately stop overflow and shall immediately report overflows to the Owner's emergency dispatch center and the Owner's Representative. The Contractor shall be responsible for any containment and cleanup of liquids and solids and stabilization of the area affected. This work shall be performed at the Contractor's expense with no additional cost to the Owner. The Contractor shall also be responsible for notifying the Owner's Representative and complying with any and all regulatory requirements for cleaning up the spill at no additional cost to the Owner. The Contractor shall be responsible for any fines assessed by regulatory agencies including the Georgia Environmental Protection Division (EPD).

G. During wastewater flow control operations, the Contractor shall take proper precautions to prevent damage to existing sanitary sewer facilities, flooding, or damage to public or private property.

H. The Contractor shall be responsible for, and make repairs, replacements or rebuilds, as directed by the Owner's Representative, to any portion of the sewer system damaged during any plugging or bypass/diversion pumping operation. All such repairs, replacements, and rebuilding shall be paid for by the Contractor.

I. The Contractor shall be responsible for, and make such provisions, as are necessary, for handling all flows in existing sewers, connections, and manholes by pipes, flumes, or by other approved methods at all times, when his operations would, in anyway, interfere with normal functioning of those facilities.

J. The Contractor shall be responsible for the removal of any debris and sedimentation in the existing sewers, laterals, and manholes, etc., attributable to his work under this Contract. The Contractor is responsible for the proper disposal of these items. The debris and liquids are to be disposed of properly in accordance with all applicable laws. The local municipality can furnish a letter to the landfill stating the contractor is authorized to dispose of the non-hazardous materials. Debris and liquids type and quantities are to be tracked in the daily Contractor diary. Hauling and disposal costs will be borne by the Contractor.

K. It is the Contractor's responsibility to notify in writing any Property Owner and/or resident having a sewer service connection on the sewer being rehabilitated or replaced. The Contractor shall notify Property Owners 48 hours prior to commencing sewer rehabilitation or replacement. The Contractor shall be solely responsible for any damage caused by property service connection backups caused by the sewer rehabilitation operations.

3.06 CLEAN UP

A. Keep premises free from accumulations of waste materials, rubbish, and other debris resulting from the Work.

B. Restore to original condition portions of site not designated for alterations by Contract Documents.

C. When by-pass pumping operations are complete, drain piping into sanitary sewer prior to disassembly.

END OF SECTION

SECTION 01540

SECURITY AND SAFETY

PART 1 - GENERAL

1.01 SECURITY PROGRAM

A. The **Contractor** shall protect the Work, including field office trailers and contents, from theft, vandalism, and unauthorized entry.

B. The **Contractor** shall initiate a site security program at the time of mobilization onto the Work site that provides adequate security for material stored and installed onsite.

C. The **Contractor** shall maintain the security program throughout the Contract duration.

D. The **Contractor** and subcontractors shall be wholly responsible for the security of its storage compound and laydown areas, and for plant, material, equipment, and tools at times.

E. The **Contractor** shall provide the **County** with a list of 24-hour emergency phone numbers, including chain of command.

F. The **Contractor** must cooperate with Owner on all security matters and must promptly comply with any project security arrangements established by the Owner or Program Manager.

G. It is the **Contractor's** obligations to comply with all applicable governmental requirements and regulations and to undertake reasonable actions to establish and maintain secure conditions at any job site.

H. The **Contractor** shall be solely responsible for the safety and security of materials, equipment, their employees, their subcontractors and or any person who enters County's premises for any reason(s) related to this contract.

I. The **Contractor** shall comply with the site safety and security program at all times on the Owner's facilities.

J. The **Contractor** shall only allow entry to authorized persons with proper Owner-approved identification. All Contractor and Subcontractor employees will be required to have personnel working at these facilities photographed for an Owner-provided identification (ID) badge before they start work.

K. The **Contractor** shall not allow cameras on-site or photographs to be taken, except those required to perform the Work in accordance with the Contract Documents or otherwise approved by Owner. Photos taken on the County

property for any reason (mishaps, near misses, accidents etc.) are prohibited from being used for Social Media and Training references unless authorized by the County.

L. It is the responsibility of the **Contractor** to ensure all articles of possible personal or monetary value found by the Contractor's employees are turned into the Owner or Program Manager.

M. The **Contractor** shall be responsible for maintaining satisfactory standards of employees' competency, conduct, courtesy, appearance, honesty and integrity, and shall be responsible for taking such disciplinary action with respect to any employee, as may be necessary.

N. The **Contractor** shall provide the County with a list of 24-hour emergency phone numbers, including a chain of command.

O. **Contractors** with non-English speaking employees shall provide an English speaking person, who has the ability to translate or communicate vital project specific or safety information.

1.02 PROJECT SAFETY

A. DRUG AND ALCOHOL POLICY

Any person under the influence of /or in possession of, distributing and/or selling control substances and/or alcohol will be removed from the site immediately. Prescription medication is allowable if it is contained in its original package and does not affect an employee's performance. DWM has a zero tolerance Drug and Alcohol policy.

B. COMPETENT PERSON REQUIREMENTS

Contractor and their Subcontractor shall have a Competent Person on the project for all operations as required by OSHA Standards.

1. A competent person identified and on-site before any scaffold erection may begin and/or modified.

2. A competent person identified and on-site before any excavation may begin and/or modified.

3. A competent person identified and on-site before any Confined Space may begin.

4. A competent person identified and on-site before any rigging operation may begin.

5. A competent person identified to erect and inspect concrete formwork.

OSHA defines a competent person as one who is capable of identifying existing and predictable hazards in surroundings or working conditions that are unsanitary, hazardous or dangerous to employees, and who has the authority to take prompt corrective measures to eliminate them.

C. COMMUNICATIONS

1. Contractor shall Plan and execute all work in a manner, which complies with the stated objectives of their Project Safety Program.

2. Contractor employees and their subcontractors shall complete a Project Site-Specific Health and Safety Orientation identifying projects hazards, detailing these specified project rules and DeKalb County Watershed Management Project Rules **(See Section C).** Employees shall complete this orientation before starting work.

3. Contractor shall create and maintain for project(s) an emergency action plan (EAP) which addresses the notification of the closet police, fire or ambulance and rescue services.

4. In case of a utility line break please contact 911 in addition to DWM Dispatch at 770-270-6243, the utility owner (Sewer, Water, Gas, Cable, and Electrical) and your project contract public relation representative. Please note: Gas Sewer and Electrical lines are considered Hazardous. Prompt emergency actions must follow immediately.

5. Contractors are required to have on file in the job trailer, a copy of their company's Safety Program and Hazard Communication Program.

6. All accidents must be reported to DWM Management immediately after occurrence. Accident reports and investigation forms must be completed and a copy to DWM Safety within 24 hours of an accident. All incidents or near misses must be reported to DWM Safety immediately for proper investigation and corrective actions to ensure prevention.

7. Contractor's accident/incident report shall contain (but not be limited too) the following:

    a. Name of person injured
    b. Date and time of injury
    c. Name(s) of all witnesses
    d. Details of the accident
    e. Root Cause analysis of accident
    f. Action taken to prevent re-occurrence of incident/accident

g. Nature/Extent of injury

h. Name of doctor/ emergency provider

8. All contractor personnel requiring medical attention shall be drug screened in accordance with the County's policy.

9. Tool Box Talks must be completed at least weekly. The toolbox talk must be documented with the signatures of all employees attending. Topics should include information relative to ongoing or upcoming operations and previous week's accidents.

10. Subcontractors must maintain and have available first aid and bloodborne pathogens kit.

11. Contractors and their subcontractors are responsible for transportation and payment for treatment of their employees. It is the responsibility of each contractor to arrange for medical treatment of his or her injured employees.

12. Contractors and Subcontractors are responsible for the conduct of their employees and housekeeping of the construction/project site.

13. Any damage to existing or stored property or materials will financially be the sole responsibility of the offending subcontractor(s).

D. DISCIPLINARY POLICY

1. Contractor employees must work safely as a condition of employment on this project. DeKalb County reserves the right to remove any contractor employees from this project for unsafe behavior or failure to follow safe work practices. Insubordination or any act that causes an Immediately Dangerous to Life and Health (IDLH) situations will not be tolerated and will result in automatic removal.

E. PROJECT SITE

1. Vehicle parking is in designated areas only- Forward First Policy.

2. Report all unsafe site conditions to DWM Management for which the contractor does not have the resources or is not responsible to implement corrective action.

3. Only trained, certified and authorized employees shall operate forklifts, aerial lifts, cranes, machinery, heavy equipment, tools, and vehicles. All equipment shall be operated in accordance with manufacturer's specifications and all other applicable laws/standards. The operator must have certification cards on their person.

4. Cell phones are not allowed to be used onsite except for supervisors and management.

5. All subcontractors shall have warning devices on moving equipment and trucks in the proper working order while on site.

F. ELECTRICAL

Subcontractors must use either an assured grounding program and/or Ground Fault Circuit Interrupters (GFCI) for protection from shock/electrocution.

G. HAZARDOUS COMMUNICATION PROGRAM

Contractors are required to have on file with DWM and project job trailer, a copy of their company's Hazard Communication Program. Hazard Communication programs must include an inventory list of hazardous materials, explanation of their labeling system, and all corresponding safety data sheets (SDS) and name of the program coordinator. Contractor shall make the inventory list of hazardous materials available upon request by the County.

1.03 ENTRY CONTROL

A. The **Contractor** shall restrict entry of unauthorized personnel and vehicles onto the Project site.

B. The **Contractor** shall allow entry only to authorized persons with proper identification.

C. The **Contractor** shall maintain an Employee Log and Visitor Log and make the log available to the **County** upon request. This log shall be submitted to the **County** bi-weekly, or as necessary.

D. The **Contractor** shall require visitors to sign the Visitor Acknowledgment of the Program Site Rules/Visitor Log, which includes a release form. Copies of these forms shall be submitted to the **County** bi-weekly and maintained in the **Contractor's** security files on-site. See **Section** A.

E. The **Contractor** shall require each employee to sign the Employee Acknowledgment of Project Site Rules Log included in **Section C**. Employees, subcontractor employees, and lower-tier **Contractor** employees will receive a new employee orientation. Signing the Employee Log by the employee is certifying that the orientation training has been received.

F. The **County** has the right to refuse access to the site or request that a person or vehicle be removed from the site if found violating any of the Project safety, security, or conduct rules.

1.04 BARRICADES, LIGHTS, AND SIGNALS

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

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

1.05 RESTRICTIONS

The **Contractor** shall not allow cameras on site or photographs taken without approval of the **County,** except as required under **Section 01380 – Photographic Documentation.**

1.06 CONTRACTOR SAFETY/HEALTH AND SECURITY PLAN

A. Within 30 days of Notice to Proceed, and prior to the performance of any Work, the **Contractor** shall prepare and submit a Contract-specific Health, Safety, and Security Plan signed by an officer of the **Contractor's** organization. Adequacy is the responsibility of the **Contractor**.

B. The **County** will review the **Contracto**r**'s** Health, Safety, and Security Plan for the adequacy of the plan. The plan shall:

1. Identify the person(s) responsible for implementation and enforcement of Health, Safety, and Security rules and regulations for this Project.
2. Address safe Work procedures for the activities within the **Contracto**r**'s** scope of Work.
3. Include a new employee orientation program to address job- and site-specific rules, regulations, and hazards.
4. Include the **Contractor's** Drug-Free Work Place Policy describing the substance abuse prevention and testing program.
5. Include provisions to protect the **Contractor's** employees, other persons, and organizations possibly affected by the Work from injury, damage, or loss.
6. Comply with current Fed/OSHA regulations; the Health, Safety, and Security Plan; the facility safety program (when applicable); and locally accepted safety codes, regulations, and practices.

7. Include a site-specific emergency action and evacuation plan.

8. Include Hazard Communication/Right-To-Know Program.

9. Include security procedures for the **Contractor's** Work, tools, and equipment.

10. Include the capability of providing the **County** with documentation to show compliance with the plan, plus accidents, and investigation reports.

11. Address other contract-specific requirements, including the Unique Requirements of these specifications.

C. Prior to the start of Work, **Contractor** shall provide Job Safety Analyses (JSAs) for unique Work activities necessary to prosecute the scope of Work.

D. Review of the **Contractor's** Health, Safety, and Security Plan by the **County** shall not impose any duty or responsibility upon the **County** for the **Contractor's** performance of the Work in a safe manner.

E. The **Contractor** shall be fully responsible for the safety and health of its employees, its subcontractors, and lower tier contractors during performance of its Work.

F. The **Contractor** shall provide the **County** with safety reports, training records, competent person list, and accident reports prepared in compliance with Fed/OSHA and the Project Health, Safety, and Security Plan.

1.07 PROJECT SAFETY COORDINATOR

A. The **Contractor** shall be responsible for the safety of the **Contractor's** and **County**'s employees, the **County's** personnel and other personnel at the Work site. The **Contractor** shall identify a Project Safety Coordinator (PSA) on the job with an appropriate office on the job site to maintain and keep available safety records and up-to-date copies of pertinent safety rules and regulations.

B. The Project Safety Coordinator shall:

1. Comply with applicable health and safety requirements of governing legislation.

2. Schedule and conduct safety meetings and safety training programs as required by law and included in the **Contractor** Health, Safety, and Security Plan for personnel engaged in the Work.

3. Post appropriate notices regarding safety and health regulations at locations that afford maximum exposure to personnel at the job site.

4. Post the name(s), address and hours of the nearest medical doctor(s), names and addresses of nearby clinics and hospitals, and the telephone numbers of the fire and police departments.

5. Post appropriate instructions and warning signs with regard to hazardous areas or conditions.

6. Have proper safety and rescue equipment adequately maintained and readily available for any contingency. This equipment shall include such applicable items as: proper fire extinguishers, first aid kits, safety ropes, and harnesses; stretcher, life preservers, oxygen breathing apparatus, resuscitators, gas detectors, oxygen deficiency indicators, explosion meters; and other equipment mandated by law.

7. Inspect each Work crew at least once daily in accordance with an Inspection Checklist Report Form to make sure that workers are wearing their appropriate personal safety equipment; machines, tools, and equipment are in safe operating condition; Work methods are not dangerous; and the Work site and Work methods are free of hazards.

8. Submit to the **County,** upon request, copies of inspection checklist report forms; safety records, safety inspection reports, and certifications from regulating agencies and insurance companies.

9. Immediately notify the **County** of a serious accident, followed by a detailed written report within 24 hours. “Serious accident” is defined as that requiring an absence of Work of more than two days and/or hospitalization.

10. Immediately notify the **County** in the event of a fatal accident.

11. Immediately notify the **County** of any accident claim against the **Contractor** or any subcontractor, followed by a detailed written report on the claim, and its resolution.

12. Review safety aspects of the **Contractor’s** submittals as applicable.

1.08 IDENTIFICATION BADGES AND SECURITY

A. All **Contractor’s** employees and subcontractors’ staff who will be working on-site shall be issued an ID badge by the **County**.

B. Special Circumstances. The **County** can grant/permit a **Contractor** the right to badge their employees and subcontractors. However, the badge template shall be approved by **DWM** Safety Division. The ID badge shall include worker’s name, date of issue, picture, and company affiliation.

C. It is the **Contractor’s** responsibility to collect the ID badge from any employee who is been discharged or resign prior to completion of the project as well as at completion of the project. **Contractors** shall return all ID badges to the **DWM** Safety Division within 48 hours. The **Contractor** shall be charged a fee of $25.00 per badge for any badges not returned at

completion of the project. For ID badges lost during the term of the project, there will be a reissued fee of $15.00 per ID badge. The **Contractor** shall deduct these charges from its periodic or closeout payment request or the **County** shall deduct them.

D. The **Contractor** shall be responsible for maintaining a safe “drug-free” work environment.

E. The **Contractor** shall develop a Security Plan for use on the job site during construction. The Plan shall encompass at a minimum such topics as the use of pre-employment background checks for specific project staff, drug tests, crime prevention and anti-theft procedures, workplace violence, and methods to secure project documents. The staff working on the site shall be familiar with the requirements of the Security Plan.

F. County Ordinances prohibit the carrying of weapons on County property/jobsites. The County Police Department shall be notified of any person bringing weapons to the jobsite; they shall be removed immediately and prosecuted.

G. Persons on the jobsite shall report any suspicious activity by workers or by others at the jobsite area first to the Project Management, and/or DeKalb County Police and/or Fire Department by calling 911 and immediately to the Engineering and Construction Management Service Division Head.

1.09 REMOVAL

A. The **Contractor** shall remove equipment and devices when no longer required and repair damage caused by installation.

B. Should the **Contractor** dismiss employees who have been given access to the DWM facilities while the contract is in force, the Contractor will advise the DWM Security Office.

C. The Owner may request the **Contractor** to immediately remove from the premises and/or dismiss any employee found unfit to perform duties due to one or more of the following reasons:

- Neglect of duty, absenteeism, security or safety problems and sleeping on the job.
- Disorderly conduct, use of abusive or offensive language, quarreling, intimidation by words, actions or fighting.
- Theft, vandalism, immoral conduct or any other criminal action.
- Selling, consuming, possessing, or being under the influence of intoxicants, alcohol or illegal substances, which produce similar effects while on duty.

- Involved in a vehicle accident while on the Owner's property or driving the Owner's equipment. No employee, Contractor, or Subcontractor will be extended privileges to drive the Owner's equipment on the Owner's property if driving privileges have been withdrawn by the person's State of residence.

D. All employees will be required to sign in and out on a designated log sheet.

E. All employees shall be required to wear at all times in an observable location, above the waist, on outer clothing, an appropriate photo I.D. badge to be furnished by the Contractor and approved by the Owner.

F. No one under age sixteen is permitted at work sites after normal working hours. Contractor's employees are allowed on work sites only during the specified hours and only when working on this contract. No Contractor employee will be allowed on sites when not specifically working on this Contract's predetermined times and dates.

G. All employees and agents of the Contractor must read the Project Site Rules statement and sign a log acknowledging understanding of project site rules provided in **(Sections A & C)**.

1.10 (DWM) Contractor Badge Procedures

The ID badge will provide proof of authorization to be on the construction site, and aid DWM staff in affirming the contractor's employee has received safety training prior to the start of work at DWM project, site or facility.

A. GENERAL REQUIREMENTS

1. All individuals working on any DeKalb County Department of Watershed Management – construction projects, sites, and facilities shall be required to wear a County issued ID badge.

2. Contractors and subcontractors working on (DWM) projects, sites and facilities must have their assigned badge on their person at all times.

3. All contractors and subcontractors personnel without a current badge will not be allowed to continue to work at a (DWM) project, site or facility.

4. All workers must obtain and display an identification badge issued by the County's Safety Representative **before** reporting to work on any (DWM) construction project.

5. Although a contractor may only be required to visit our sites/property on an infrequent basis, badging is still a requirement.

6. Contractors and subcontractors vendors or their transient onsite visitors, which are not full-time employees of the site, shall be escorted while onsite as a visitor by a Department of Watershed Management badged contractor.

7. Contractors shall maintain a daily sign-in sheet/record/log of their daily workers under its supervision which includes subcontractor's vendors or their transient onsite visitors.

B. TRAINING REQUIREMENTS

1. Contractor and subcontractor employees are required to attend safety training prior to receiving a badge.

2. The **Contractor** is responsible for conduction and/or arrangement of their employee's training.

   a. OSHA 10 hour, OSHA 30 hour or project site-specific safety training along with the contractor receiving a copy of DeKalb County Project Site Rules will suffice the training requirements to receive a badge and start work on the (DWM) construction project(s), site or facility.

   b. OSHA 10 hour and 30-hour safety training received within 12 months prior to the start of work on the (DWM) construction project(s), will qualify as current.

   c. Whereas the OSHA 10 hour and 30-hour training does not expire, the actual date of training must be less than 12 months prior to the start of work on the (DWM) construction project(s) to qualify as "current,"

   d. In the case where the OSHA 10 hour and 30-hour date of training are more than 12 months prior to the start of work on the (DWM) construction project(s), project site-specific safety verification of training is required.

   e. Contractor's training should include general construction safety and the specific safety concerns/hazards employees may encounter at the Watershed Management construction site.

   f. DMW' Safety Division shall review a copy of the contractor's project site-specific safety training topics outline prior to the contractor's employees were approved for badging.

   g. Contractor and subcontractor employees are required to read, understand and agree to abide by DeKalb County Project Site Rules. See **Sections A & C**.

C. VERIFICATION OF TRAINING

1. The contractor's management representative shall complete, sign and send a copy of each of their employee or their subcontractor's employee a copy of (DWM) Verification of Training Form. **See Section E.**

2. (DWM) Verification of Training Document will be sent to **VOTD@DeKalbcountyga.gov** prior to the contractor's employee badging date of appointment**.**

3. The contractor's/subcontractor's employee shall review and verify that the information on their individual (DWM) Verification of Training document is correct.

4. The contractor's employee shall also sign (DWM) Verification of Training Form verifying the information on the document is correct. The (DWM) Verification of Training Document signature statement is as follows:

   "I have read, understand and agree to abide by the DEKALB COUNTY PROJECT SITE RULES. I have received a personal copy for my use and reference. Furthermore, I understand that knowingly or purposely falsifying records is grounds for being denied access to the project site."

D. VERIFICATION OF IDENTITY REQUIREMENTS

1. The contractor and subcontractor employees must provide documentation to DeKalb County to verify their identity and authorization to work.

2. DeKalb County only accepts Form I-9 acceptable documents with accompanying photo.

3. I-9 acceptable documents must be from List A and List B (Examples)

   - ID cards issued by federal, state, local governmental agencies
   - TWIC (Transportation Worker Identification Credential)
   - Driver License or Identification card issued by a state motor vehicle department with a photo that clearly identifies the individual.

E. DWM MANAGEMENT SITE INSPECTIONS AND AUDITS

Field verification will be done randomly by the DWM Safety staff to ensure employees were trained and following County, OSHA & State regulations.

F. BADGING OFFICE ADDRESS IS AS FOLLOWS

DeKalb County Watershed Management,
Safety Division
1641 Road haven Drive, Stone Mountain, GA 30083

Badging hours are Tuesdays & Thursdays from 9:00 am to 12:00 pm.

G. BADGE EXPIRATION DATE

Badges are valid until the expiration date of the prime contractor's contract.

H. TRANSFER CONTRACTORS

If a worker changes companies or projects, the badge must be surrendered and a new badge will be issued if needed.

If applicable, the new employer will provide the employee certification that the safety training is completed.

Only those employees registered in the badging system are eligible to receive a badge,

After verification by the safety representative, the badging database will be updated and a new badge issued.

I. SPECIAL CIRCUMSTANCES:

The County can grant/permit a Contractor the right to badge their employees and subcontractors. However, the badge template shall be approved by the DWM Safety Division. The ID badge shall include the worker's name, picture, and company affiliation.

J. ADDITIONAL TRAINING REQUIREMENTS:

Additional training requirements may be requested if there is a change in the contractor's scope of work or responsibilities.

K. BADGE REPLACEMENT

The contractor must notify DMW's Safety Division immediately if a badge is lost, stolen or an employee is no longer employed with the contractor.

L. BADGE COLLECTION/ RETURN POLICY

It shall be the **Contractor's** responsibility to collect the ID badge from any employee who is discharged or resigns prior to completion of the project as well as at the completion of the project. The **Contractor** shall return the ID badges to the **DMW' Safety Division** within 48 hours of their collection. The **Contractor** shall be charged a fee of $25.00 per badge for any badges not

returned at the completion of the project. For ID badges lost during the term of the project, that shall be reissued, there shall be a charge of $15.00 per ID badge. The **Contractor** shall deduct these charges from its periodic or closeout payment request or the **County** shall deduct them.

SECTION A

VISTOR ACKNOWLEDGMENT OF THE PROJECT SITE RULES

By signing this Visitor's Log, I acknowledge that I understand and agree to abide by the project rules outlined below.

In consideration of my receipt of a visitor's pass as issued by the **County** directly or indirectly for the **County**, I waive on behalf of myself, my heirs, employer, legal representatives and assigns and hereby release and discharge the **County**, each of its directors, officers, employees, representatives, and agents from any and all claims, actions, causes of action, or any charge of any kind whatsoever that may arise or could arise in the future as a result of my being present at the facility including injury, death, or property damage whether or not caused by the fault or negligence of any of the parties released hereunder.

I further acknowledge that I have been briefed on specific hazards, hazardous substances that are on site, and the site emergency action procedure.

PROHIBITED ACTIVITIES

- Unauthorized removal or theft of County property
- Violation of safety or security rules or procedures
- Possession of firearms or lethal weapons on jobsite
- Acts of sabotage
- Destruction or defacing of County property
- Failure to use sanitary facilities
- Knowingly or purposely failing to report accidents/incidents or job-related injuries
- Being under the apparent influence of drugs, alcohol, or other intoxicants or in possession of drugs, alcohol, or other intoxicants on the job site
- Wearing shorts or tennis shoes on the job site
- Failure to wear required personal protective equipment (PPE)
- Gambling, fighting, threatening behavior or engaging in horseplay on the job site
- Smoking in unauthorized areas on the job site
- Open fire cooking or making unauthorized fires on job site
- Selling items or raffles without authorization
- Use of unauthorized cameras on the job site
- Use of radio or television in the construction area
- Failure to park personal vehicle in authorized parking area
- Failure to wear designated identification [Site Specific]

- Failure to use designated gates
- Condoning or knowingly allowing a person to engage in or work around a patently unsafe or environmental compromising act or condition
- Knowingly or purposely falsifying records, documents or providing false testimony

I have read, understand, and agree to abide by the PROJECT SITE RULES. Furthermore, I understand failure to abide by these rules is grounds for being denied access to the project site. I have received a personal copy for my use and reference.

Print Name	**Signature**
Date	

SECTION B

VISITOR LOG

THE SIGNING OF THIS LOG ACKNOWLEDGES I HAVE READ, UNDERSTAND, AND AGREE TO ABIDE BY THE PROJECT RULES OUTLINED ABOVE. **THIS IS NOT A VEHICLE ACCESS PERMIT.**

NAME PRINT	SIGNATURE	COMPANY/PERSON VISITED	DATE	IN	OUT
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm
				am/pm	am/pm

SECTION C

EMPLOYEE ACKNOWLEDGMENT OF THE PROJECT SITE RULES

By signing this Employee Log, I acknowledge that I understand and agree to abide by the project rules outlined below.

PROHIBITED ACTIVITIES

- Unauthorized removal or theft of County property
- Violation of safety or security rules or procedures
- Possession of firearms or lethal weapons on jobsite
- Acts of sabotage
- Destruction or defacing County property
- Failure to use sanitary facilities
- Failure to report accidents or job-related injuries
- Under the apparent influence of drugs, alcohol, or other intoxicants or in possession of drugs, alcohol or, other intoxicants on the property
- Wearing shorts or tennis shoes on the jobsite
- Failure to wear a hardhat/safety glasses and safety vest
- Gambling at any time on the project
- Fighting, threatening behavior, or engaging in horseplay on the project
- Smoking in unauthorized areas on the project
- Open fire cooking or making unauthorized fires on project property
- Selling items or raffles without authorization
- Use of unauthorized cameras on the project
- Use of radio or television in the construction area
- Failure to park personal vehicle in authorized parking area
- Failure to wear designated identification [Site Specific]
- Failure to use designated gates

I have read, understand, and agree to abide by the PROJECT SITE RULES. Furthermore, I understand failure to abide by these rules is grounds for being denied access to the project site. I have received a personal copy for my use and reference.

Print Name	**Signature**
Date	

SECTION D

EMPLOYEE LOG

BY SIGNING THIS LOG ACKNOWLEDGMENT, I HAVE READ AND UNDERSTAND, AND AGREE TO ABIDE BY THE PROJECT RULES OUTLINED ABOVE AND ANY STATE, FEDERAL, LOCAL, OR ANY OTHER CONTRACT OBLIGATIONS THAT MAY APPLY. I FURTHER ACKNOWLEDGE THAT I HAVE BEEN ORIENTED AS TO THE SITE-SPECIFIC HAZARDS, ANY HAZARDOUS SUBSTANCES I MAY BE EXPOSED TO WHILE ON THE SITE, AND THE SITE/COMPANY EMERGENCY ACTION PROCEDURES, BY A REPRESENTATIVE OF THE COMPANY.

EMPLOYEES (PRINT)	SIGNATURE	COMPANY NAME	DATE
Signature of Company Representative:		*Date Signed:*	

SECTION E

DeKalb County Government Training Verification Form

Appointment Date: _____
(Tues./Thurs. 9am-12pm)

_____ _____
Primary Contractor: DeKalb Contract #:

_____ _____
Subcontractor Name: Contract End Date:

□ **Course Name: Site Specific Safety Training in accordance with OSHA 29 CFR 1926 & 1910**
Successfully Completed: □ Yes □ No □ In Progress
Date Completed: _____

□ **Course Name: OSHA 10 Hour**
Successfully Completed: □ Yes □ No □ In Progress
Date Completed: _____

□ **Course Name: OSHA 24 HAZWOPER**
Successfully Completed: □ Yes □ No □ In Progress
Date Completed: _____

□ **Course Name: OSHA 30 Hour**
Successfully Completed: □ Yes □ No □ In Progress
Date Completed: _____

□ **Course Name: OSHA 40 HAZWOPER**
Successfully Completed: □ Yes □ No □ In Progress
Date Completed: _____

I HAVE READ, UNDERSTAND AND I HAVE BEEN PROVIDED A COPY OF THE DEKALB PROJECT SITE RULES. FURTHERMORE, I UNDERSTAND THAT KNOWINGLY OR PURPOSELY FALSIFYING RECORDS IS GROUNDS FOR BEING DENIED ACCESS TO THE PROJECT SITE. BY MY SIGNATURE BELOW, I AFFIRM THE ABOVE INFORMATION IS ACCURATE AND TRUE TO THE BEST OF MY KNOWLEDGE.

_____ _____
Employee's Name (Print): **Employee's Name (Sign):**

_____ _____
Authorized Representative (Print): **Authorized Representative (Sign):**

END OF SECTION

SECTION 01550

TRAFFIC REGULATION

PART 1 - GENERAL

1.01 SCOPE

The Work specified in this section includes the provision of products, permits, services, procedures, and personnel by the **Contractor** to effect traffic control during the Work.

1.02 TRAFFIC CONTROL MANAGER REQUIREMENTS

A. The **Contractor** shall designate a qualified individual as the Traffic Control Manager (TCM) who shall be responsible for selecting, installing, and maintaining traffic control devices in accordance with the Plans and Specifications and the Manual of Uniform Traffic Control Devices (MUTCD). A written resume documenting the experience and credentials of the TCM shall be submitted and accepted by the **County** prior to beginning any Work that involves traffic control. The TCM shall be available on a 24-hour basis to perform his or her duties. If the Work requires traffic control activities to be performed during the daylight and nighttime hours, it shall be necessary for the **Contractor** to designate an alternate TCM. An alternate TCM shall meet the same requirements and qualifications as the primary TCM and be accepted by the **County** prior to beginning any traffic control duties. The TCM's traffic control responsibilities shall have priority over other assigned duties.

B. As the representative of the **Contractor**, the TCM shall have full authority to act on behalf of the **Contractor** in administering the Traffic Control Plan. The TCM shall have appropriate training in safe traffic control practices in accordance with Part VI of the MUTCD. In addition to the TCM, other individuals making decisions regarding traffic control shall meet the training requirements of Part VI of the MUTCD. The TCMs shall supervise the initial installation of traffic control devices. The **County,** prior to the beginning of construction, will review the initial installation. Modifications to traffic control devices as required by sequence of operations or staged construction shall be reviewed by the TCMs.

PART 2 - PRODUCTS

2.01 SIGNS, SIGNALS, AND DEVICES

A. The **Contractor** shall provide post-mounted and wall-mounted traffic control and informational signs as specified and required by local jurisdictions.

B. The **Contractor** shall provide automatic traffic control signals as approved by local jurisdictions.

C. The **Contractor** shall provide traffic cones and drums, and flashing lights as approved by local jurisdictions.

D. The **Contractor** shall provide flagmen equipment as required by local jurisdictions.

PART 3 - EXECUTION

3.01 PERMITS

A. The **Contractor** shall obtain permits from authorities having jurisdiction over road closures before closing any road. The **Contractor** shall use forms provided by authorities having jurisdiction (DeKalb County Department of Public Works, Georgia Department of Transportation, etc.).

B. The **Contractor** shall either fax or hand-carry any permit applications to the DeKalb County Department of Public Works. Permit applications shall indicate the time (in days); length (in feet); the number of lanes; and the purpose of the closure.

C. All permits are approved for operations during off-peak hours, 9:00 a.m. to 4:00 p.m., unless special approval is received from the **County**.

D. Operations between the hours of 6:00 p.m. and 10:00 p.m. and Saturdays, and Sundays shall require approval by the **County.**

E. Full street closure permits shall require 96 hours' advance notice prior to road closure. The following additional information shall be provided by the **Contractor** prior to approval:

1. The recommended detour route with signage and Traffic Management Plan as per the MUTCD.
2. A copy of the resident and/or business notification letters about the closure. The residents/businesses located between the detour routes shall be notified about the closure at least 5 business days prior to the proposed closure.

F. The DeKalb County Department of Public Works will return full road closure permit applications to the **Contractor.** The Fire Chief, Chief of Police, DeKalb Hospital, MARTA, and the DeKalb County Board of Education shall be notified in writing at least 72 hours before commencing road closure activities.

Lane closure permits are issued during operating hours Mondays through Fridays. The DeKalb County Department of Public Works will return lane closure permit applications to the **Contractor.** The **Contractor** shall provide a minimum of 48-hour notice prior to closure. The **Contractor** shall continuously maintain the safety of the traveling public during lane closures in accordance with the requirements of the MUTCD and as stipulated by public officers.

3.02 PREPARATION OF TRAFFIC CONTROL PLANS

The Traffic Control Plan drawings included with the Contract Documents shall only be considered as a guide and are not intended to contain the traffic regulation details that shall be required by the specifications, permitting agencies, and the MUTCD. The **Contractor** shall develop detailed staging and traffic control plans for performing specific areas of the Work including, but not limited to: requirements for certified flagmen, additional traffic control devices, traffic shifts, detours, paces, lane closures, or other activities that disrupt traffic flow. The **Contractor** shall submit these plans in accordance with the Specifications to receive final approvals from permitting agencies and provide required traffic control devices as required by both the permitting agencies and these specifications at no additional cost to the **County**.

3.03 CONSTRUCTION PARKING CONTROL

A. The **Contractor** shall control vehicular parking to prevent interference with public traffic and parking, access by emergency vehicles, and **County's** operations.

B. The **Contractor** shall monitor parking of construction personnel's vehicles in existing facilities and maintain vehicular access to and through parking areas.

C. The **Contractor** shall prevent parking on or adjacent to access roads or in non-designated areas.

3.04 MAINTENANCE OF TRAFFIC

A. Whenever and wherever, in the **County's** opinion, traffic is sufficiently congested or public safety is endangered, the **Contractor** shall furnish uniformed officers to direct traffic and to keep traffic off the highway area affected by construction operations.

B. When the Contract requires the maintenance of vehicular traffic on an existing road, street, or highway during the **Contractor's** performance of Work that is otherwise provided for in the Plans and these Specifications, the **Contractor** shall keep such road, street, or highway open to traffic and shall provide such maintenance as may be required to safely accommodate traffic. The **Contractor** shall furnish, erect, and maintain barricades, warning signs, flagmen, and other traffic control devices in conformity with the requirements of the Georgia Department of Transportation and other local jurisdictions. The **Contractor** shall also construct and maintain in a safe condition any temporary connections necessary to ingress to and egress from abutting property or intersecting roads, streets, or highways. The **Contractor** shall maintain traffic in accordance with any traffic control plans furnished with and made a part of the Plan assembly.

C. The **Contractor** shall make its own estimate of labor, materials, equipment, and incidentals necessary for providing the maintenance of traffic as specified in this section.

D. Unless specified in the Plans or these Specifications, and subject to the approval of the **County**, the cost of maintaining traffic specified in this section shall be considered incidental to the Work and no separate measurement or payment shall be made.

E. Contractor shall comply with DeKalb County Steel Plate for Residential Specification **(See Section A)**.

F. Contractor shall provide a pilot car or an escort vehicle when heavy equipment must be moved from one location to another by use of the roads, streets and through DeKalb County.

3.05 UNIFORMED POLICE OFFICER FOR TRAFFIC CONTROL

A. The **Contractor** shall provide uniformed police officers to regulate traffic when construction operations encroach on public traffic lanes, as approved by the **County**.

B. Officers shall be currently employed by a local jurisdiction, be in full uniform and have full arrest power while working.

C. Officers shall be employed and paid by the **Contractor**.

D. Officers' shall be responsible for directing traffic within the construction site.

E. Only a uniformed police officer can direct traffic when the contractor's operation interfere with or impede the operation of a traffic signal light.

3.06 FLAGMEN

A. The **Contractor** shall provide trained and equipped flagmen to regulate traffic when construction operations or traffic encroaches into public traffic lanes.

B. The contractor flagmen shall have 7' Stop/Slow paddles onsite during all operations involving traffic control.

3.07 FLASHING LIGHTS

The **Contractor** shall use flashing lights during hours of low visibility to delineate traffic lanes and to guide traffic.

3.08 HAUL ROUTES

A. The **Contractor** shall consult with authorities and establish public thoroughfares to be used for haul routes and site access.

B. The **Contractor** shall confine construction traffic to designated haul routes.

C. The **Contractor** shall provide traffic control at critical areas of haul routes to regulate traffic and minimize interference with public traffic.

3.09 ROAD CLOSURES ON COUNTY ROADS

A. No street, road, or highway shall be closed without the permission of the owner of any street, road, or highway and the fire department having jurisdiction. Prior to closing a street, road, or highway, signs shall be posted for a minimum of 7 days prior to actual closing, forewarning of the imminent closing. The **County** shall determine the information to be placed upon the signs by the **Contractor**. Where traffic is diverted from the Work, the **Contractor** shall provide materials and perform Work for the construction and maintenance of required temporary roadways, structures, barricades, signs, and signalization.

B. To obtain approval to close a road or street maintained by the **County**, the **Contractor** shall proceed as follows:

1. The **Contractor** shall obtain approval of the traffic plan from the **County.** The traffic plan shall be in accordance with the requirements of the Georgia Department of Transportation and DeKalb County.
2. The **Contractor** shall obtain a utility permit.
3. The **Contractor** shall apply in writing to the **County** and obtain a permit to close the road on a specific date.
4. The **Contractor** shall obtain a permit from the **County** before posting closure signs. Signs shall be posted for 7 days prior to the first day of closure. Signs shall be acceptable to the **County**.

5. The **County** will handle emergency road closures.

3.10 PROCEDURES FOR TRAFFIC DETOUR ROUTE PLAN

A. The **Contractor** shall provide a sketch map to the **County,** showing the traffic detour route plan. The sketch map need not be drawn to scale, but should resemble, as closely as possible, the actual location. The sketch map shall be drawn in a manner so as to provide emergency agencies a better understanding of the detour for quick response. The sketch map shall include directional arrows showing the flow of traffic.

B. The **Contractor** shall erect "Road Closed Ahead" signs before the start point of the detour indicating the name of the street closed.

C. The **Contractor** shall erect "Detour" signs with appropriate directional arrows at intersection along the detour route until the end of the detour, when the traffic is back to the original street.

D. The **Contractor** shall erect an "End Detour" sign at the end of the detour.

E. The **Contractor** shall erect an accessory plate indicating the name of the street being detoured to accompany each "Detour" and "End Detour" sign.

F. The **Contractor** shall apply appropriate traffic control measures in accordance with the requirements of the MUTCD and **County** codes.

3.11 BARRICADES AND WARNING SIGNS

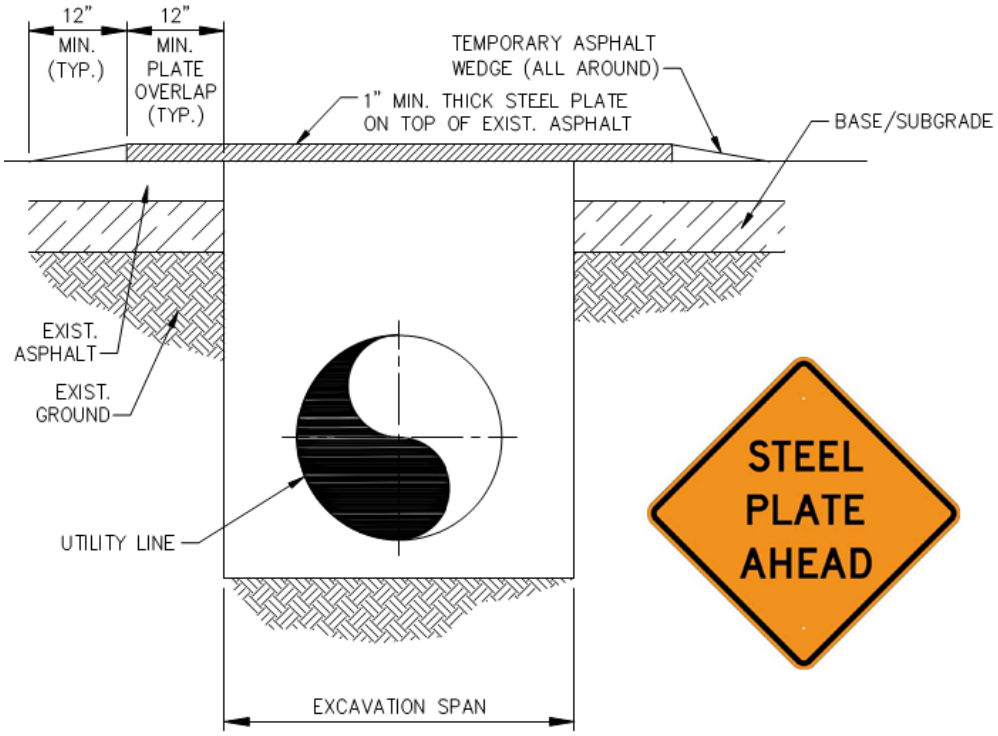
A. The **Contractor** shall furnish, erect, and maintain barricades and warning signs for hazards necessary to protect the public and the Work. When used during periods of darkness, such barricades, warning signs, and hazard markings shall be suitably illuminated or reflectorized.

B. For vehicular and pedestrian traffic, the **Contractor** shall furnish, erect, and maintain barricades, warning signs, lights, and other traffic control devices in conformity with the requirements of the Georgia Department of Transportation and DeKalb County.

C. The **Contractor** shall furnish and erect barricades and warning signs for hazards prior to commencing Work that requires such erection and shall maintain the barricades and warning signs for hazards until their dismantling is directed by the **County**.

Section A

Steel Plate Installation Urban and Residential



Notes:

1. Installation shall be used in areas where backfilling operations of an excavation in the roadway cannot meet the minimum compaction requirements and permanent patching placement within the same day.
2. All excavations shall be backfilled within the roadway.
3. Each plate is to overlap existing pavement 12” minimum in every direction and multiple plates shall abut and be secured to each other.
4. Each steel plate shall be anchored securely to prevent movement.
5. Temporary paving with a cold asphalt mix or approved equal shall be used to feather edges of the plate to form a wedged taper to cover the edges of the steel plate.
6. The steel plate shall be removed within 30 days of placement with the excavation meeting the minimum compaction requirements and permanent patching installed.
7. Any ditch line needing a steel plate longer than 30 days should have permanent patching.
8. Warning signs advising motorist that they should expect to encounter steel plates shall be placed approximately 100 feet in advance of the steel plate location. The signs shall meet MUTCD sign size requirements, shall state steel plate ahead, and shall be visible to motorist.

END OF SECTION

SECTION 02276

SITE RESTORATION AND EROSION CONTROL

PART 1 - GENERAL REQUIREMENTS

1.01 SECTION INCLUDES

A. The work specified in this Section consists of providing, monitoring, maintaining and removing temporary erosion and sedimentation controls and restoring site conditions as necessary.

B. Temporary erosion controls include, but are not limited to, Best Management Practices (BMP's) such as: grassing, mulching, netting, and watering, and reseeding on-site surfaces and spoil and borrow area surfaces and providing interceptor ditches at ends of berms and at those locations ensuring the erosion during construction will be either eliminated or maintained within acceptable limits as established by the Owner's Representative, Local Issuing Authority and State.

C. Temporary sedimentation controls include, but are not limited to, BMP's such as: silt fencing, silt dams, temporary sediment traps, temporary inlet sediment traps, barriers, rock filter dams, temporary creek crossings, diversion ditches, tree protection fencing, and appurtenances at the foot of sloped surfaces ensuring the sedimentation pollution will be either eliminated or maintained.

D. Site restoration includes, but not limited to, protecting, preserving, and reestablishing specimen trees, fences, cultivated trees and shrubbery, and man- made improvements within and surrounding the project area.

1.02 RELATED SECTIONS

A. Section 01015: Control of Work

B. Section 02110: Access Route and Easement Access Clearing

C. Section 02271: Gabions

D. Section 02273: Riprap

E. Section 02485: Sodding

F. Section 02486: Seeding

G. Section 02542: Silt Fence

1.03 REFERENCES

A. Clean Water Act

B. Georgia Building Code

C. Any Soil Erosion and Sediment Control Ordinances in force by the local Government.

D. State of Georgia, Department of Transportation, Standard Specifications.

E. Manual for Erosion and Sediment Control in Georgia, latest edition.

F. Georgia Erosion and Sedimentation Control Act

G. Georgia Water Quality Control Act

1.04 QUALIFICATIONS AND REQUIREMENTS

A. Provide effective temporary erosion and sediment control measures during construction or until final controls become effective.

B. Erosion, Sedimentation and Pollution Control shall be performed in accordance with Georgia's NPDES Permit No. GAR 100001, 100002, or 100003, as applicable, ~~and as detailed in the drawing~~s.

1.05 SUBMITTALS

A. Furnish manufacturer's data for all items confirming compliance with specifications

B. Furnish qualifications of all personnel involved in Work related to providing, monitoring, maintaining and removing temporary erosion and sedimentation controls

PART 2 - PRODUCTS

2.01 EROSION CONTROL

A. Mulch

B. Temporary grass seed

C. Permanent grass seed

D. Sod

E. Dust control

F. Slope stabilization blankets

G. Flocculants and coagulants

H. Tackifiers

I. Stream bank stabilization products

J. Slope stabilization products:

1. Rolled Erosion Control Products (RECPs): A natural fiber blanket with single or double photodegradable or biodegradable nets.

a. Blankets shall be non-toxic to vegetation, seed, or wildlife. At a minimum, the plastic or biodegradable netting shall be stitched to the fibrous matrix to maximize strength and provide for ease of handling.

b. Products shall be determined to be non-toxic in accordance with EPA- 821-R-02-012.

2. Hydraulic Erosion Control Products (HECPs): shall utilize straw, cotton, wood or other natural based fibers held together by a soil binding agent working to stabilize soil particles. Paper mulch should not be used for erosion control.

a. HECPs shall be prepackaged from the manufacturer. Field mixing of performance enhancing additives will not be allowed. Fibrous components should be all natural or biodegradable.
b. Products shall be determined to be non-toxic in accordance with EPA- 821-R-02-012.

2.02 SEDIMENTATION CONTROL

A. Bales - clean, seed free cereal hay type.

B. Netting - fabricated of material acceptable to the Owner.

C. Filter stone - No. 57 - crushed stone.

D. Filter media sock, silt fencing (Type NS or Type S).Tree save fencing.

PART 3 - EXECUTION

3.01 GENERAL

A. All erosion control measures are to be installed per the requirement listed in the construction documents as well as defined with Georgia's Manual for Erosion and Sediment Control, latest edition.

B. No payment will be made for any portion of the Project when temporary erosion and sedimentation controls are not properly installed and maintained in compliance with the Georgia Manual for Erosion and Sedimentation Control, latest edition.

3.02 VEGETATIVE MEASURES

A. Erosion control should be addressed in the planning stages of all proposed land-disturbing activities. Erosion control techniques shall be installed, monitored and maintained on all areas exposed, including areas that will be paved or built upon in the future. Various types of vegetative practices are to be used as required for erosion control. The time-line for the implementation of various vegetative practices is as follows:

B. Mulch, temporary vegetation, or permanent (perennial) vegetation shall be completed on all exposed areas within 14 days after disturbance. Failure to do so will justify Owner to immediately have work done at the Contractor's expense.

C. Ds1 - Disturbed Area Stabilization (With Mulching Only): Mulching can be used as a singular erosion control method on areas at rough grade. Mulch can be an option for up to six months provided the mulch is applied at the appropriate depth (depending on type of mulch used), anchored, and has a continuous 90% cover or greater of the soil surface. Maintenance shall be required to maintain appropriate depth, anchorage, and 90% cover. If an area will remain undisturbed for greater than six months, permanent (perennial) vegetation shall be used.

D. Ds2 - Disturbed Area Stabilization (With Temporary Seeding): Temporary vegetation may be employed instead of mulch if the area will remain undisturbed for less than six months.

E. Ds3 - Disturbed Area Stabilization (With Permanent Vegetation): Permanent (perennial) vegetation or sod shall be used immediately on areas at final grade. Permanent (perennial) vegetation shall be used on rough graded areas to remain undisturbed for six months or greater.Ds4 - Disturbed Area Stabilization (With Sodding): May be used in place of Ds3.

F. Stabilization of an area is accomplished when 70% of the surface area is covered in a uniform, vegetative cover (permanent or temporary) or anchored mulch of the appropriate thickness with 90% coverage. “Final stabilization” means all soil disturbing activities at the site have been completed, and for unpaved areas and areas not covered by permanent structures and areas located outside the waste disposal limits of a landfill cell certified by EPD for waste disposal, 100% of the soil surface is uniformly covered in permanent vegetation with a density of 70% or greater, or landscaped according to the Plan (uniformly covered with landscaping materials in planned landscaped areas), or equivalent permanent stabilization measures.

G. Permanent (perennial) vegetation shall consist of: planted trees, shrubs, perennial vines; a crop of perennial vegetation appropriate for the time of year and region; or a crop of annual vegetation and a seeding of target crop perennials appropriate for the region, such that within the growing season with a 70% coverage by perennial vegetation shall be achieved.

1. For linear construction projects on land used for agricultural or silvicultural purposes, final stabilization may be accomplished by stabilizing the disturbed land for its agricultural or silvicultural use.

2. For the purposes of this specification, permanent vegetation is used synonymously with perennial vegetation. Perennial vegetation is plant material that lives continuously from year to year although it may have a dormant season when the leaves and possibly the stems “die back” to the ground. No vegetative planting can technically be considered permanent. Annual vegetation is plant material lives for only one growing season. This type of vegetation is typically used for temporary establishment due to its quick germination. Some perennial vegetation can be used for temporary stabilization.

H. Slope Stabilization

1. It is the intention of this specification to allow interchangeable use of RECPs and HECPs for erosion protection on slopes. The Contractor should select the type of erosion control product best fitting the need of the particular site.
   a. Installation and stapling of RECPs and application rates for the HECPs shall

conform to manufacturer's guidelines for application.

b. Products shall have a maximum C-factor (ASTM D6459) for the following slope grade:

Slope (H:V)	C-Factor (max.)
3:1 or greater	0.080

2. RECPs will be categorized as follows:

a. Short term (functional longevity 12 mos.)

1) Photodegradable: Straw blankets with a top and bottom side photo degradable net. The maximum size of the mesh shall be openings of ½" X ½". The blanket should be sewn together on 1.5" centers with degradable thread. Minimum thickness should be 0.35" and minimum density should be 0.5 lbs per square yard.

2) Biodegradable: Straw blanket with a top and bottom side biodegradable jute net. The top side net shall consist of machine direction strands that are twisted together and then interwoven with cross direction strands (leno weave). The bottom net may be leno weave or otherwise to meet requirements. The approximate size of the mesh shall be openings of 0.5" X 1.0". The blanket should be sewn together on 1.5" centers with degradable thread. Minimum thickness should be 0.25" and minimum density should be 0.5 lbs per square yard.

b. Extended term (functional longevity 24 mos.)

1) Photodegradable: Blankets that consist of 70% straw and 30% coconut with a top and bottom side photodegradable net. The top net should have ultraviolet additives to delay breakdown. The maximum size of the mesh shall be openings of 0.65" X 0.65". The blanket should be sewn together on 1.5" centers with degradable thread. Minimum thickness should be 0.35" and minimum density should be 0.6 lbs. per square yard.

2) Biodegradable: Blankets that consist of 70% straw and 30% coconut with a top and bottom side biodegradable jute net. The top side net shall consist of machine direction strands that are twisted together and then interwoven with cross direction strands (leno weave). The bottom net may be leno weave or otherwise to meet requirements. The approximate size of the mesh shall be openings of 0.5" X 1.0". The blanket should be sewn together on 1.5" centers with degradable thread. Minimum thickness should be 0.25" and minimum density should be 0.65 lbs per square yard.

c. Long-term (functional longevity 36 mos.)

1) Photodegradable: Blankets that consist of 100% coconut with a top and bottom side photodegradable net. Each net should have ultraviolet additives to delay breakdown. The maximum size of the mesh shall be openings of 0.65" X 0.65". The blanket should be sewn together on 1.5" centers with degradable thread. Minimum thickness should be 0.3" and minimum density should be 0.5 lbs per square yard.

2) Biodegradable: Blankets that consist of 100% coconut with a top and bottom side biodegradable jute net. The top side net shall consist of machine direction strands that are twisted together and then interwoven with cross direction strands (leno weave). The bottom net may be leno weave or otherwise to meet requirements. The approximate size of the mesh shall be openings of 0.5" X 1.0". The blanket should be sewn together on 1.5" centers with degradable thread. Minimum thickness should be 0.25" and minimum density should be 0.5 lbs per square yard.

3. Site Preparation: After the site has been shaped and graded to the approved design, prepare a friable seedbed relatively free from clods and rocks more than one inch (1") in diameter, and any foreign material preventing contact of the soil stabilization mat with the soil surface. Surface must be smooth to ensure proper contact of blankets or matting to the soil surface. If necessary, redirect any runoff from the ditch or slope during installation.

4. Maintenance: All erosion control blankets and matting should be inspected periodically following installation, particularly after rainstorms to check for erosion and undermining. Any dislocation or failure should be repaired immediately. If washouts or breakage occurs, reinstall the material after repairing damage to the slope or ditch. Continue to monitor and maintain these areas until they become permanently stabilized.

3.03 SEDIMENTATION CONTROL

A. Install and maintain silt fencing, silt dams, traps, barriers and all other appurtenances as shown on the approved descriptions and working drawings. Hay bales, silt fencing, filter socks, and other BMP's which deteriorate and filter stone which is dislodged shall be replaced when needed. Refer to Specification 02542 – Silt Fencing for general silt fencing requirements.

B. Install and maintain temporary stream crossings as indicated in the Manual for Erosion and Sediment Control in Georgia, and as modified in these specifications, the more stringent shall apply.

C. Install and maintain riprap for all erosion and sediment control methodologies as indicated in the Manual for Erosion and Sediment Control in Georgia and as specified or modified in the Contract Documents the more stringent shall apply. Refer to Specification Section 02273 – Riprap for general riprap requirements.

3.04 SITE RESTORATION

A. Prior to clearing landscaping features, but not necessarily limited to, specimen trees, fences, cultivated trees, cultivated shrubbery, property corners, man-made improvements, subdivision and other signs, shall be noted and shall be reviewed with the Owner's Representative. The Owner's Representative will determine the landscape features to remain undisturbed. The Contractor shall take extreme care in moving landscape features and shall re-establish these features as directed by the Owner's Representative.

B. Species of plantings to be replaced shall be verified by a landscape expert. The size of the planting replacement must be equal to the size of the planting removed.

C. Fences adjoining any excavation or embankment, in the Contractor's opinion, damaged or buried, shall be carefully removed, stored and replaced. Any fencing, in the Owner's Representative opinion, damaged by lack of care shall be replaced with new fence material of equal or better quality at the Contractor's expense. If existing fence cannot be restored or new fence required by direction of the Owner, payment will constitute full compensation for removing and replacing chain link or wooden fence, in kind, on public or private property in accordance with Section 02776.

D. The Contractor shall exercise special precautions for protecting and preserving trees, cultivated shrubs, sod, fences, etc. situated within limits of the project area. The Contractor shall be held liable for any damage his operations have inflicted on such property.

E. The Contractor shall be responsible for all damages to existing improvements outside the project area resulting from Contractor's operations.

3.05 ACCEPTANCE

A. Should any of the temporary erosion and sediment control measures employed fail to produce results complying with the requirements of the State, immediately take whatever steps are necessary to correct the deficiency within the limits defined in the NPDES permit or Georgia's Manual for Erosion and Sediment Control.

B. For a product or practice to be approved as slope stabilization, the product or practice must have a documented C-factor of 0.080.

3.06 DOCUMENTATION

A. Contractor shall monitor report and retain records as required by the GA NPDES Permit No. GAR 100001, 100002, or 100003, as applicable. Attached to the end of this section are the minimal, but not limited to, reports which should be performed and maintained. The following are the attached sample reports:

1. Daily Inspection Report
2. Daily Rainfall Monitoring Report
3. Weekly Inspection Report
4. Stormwater Monitoring Data
5. Monthly Inspection Report
6. Inspection Summary Report for violations and corrective actions.

7. Erosion and Sedimentation Control Inspection Report

END OF SECTION

Daily Inspection Report

Inspection performed by certified personnel each day construction activity occurs on-site

Project Information	
Date:	Project Name:
Project Location:	
Inspection Observations	
Rainfall within past 24 hours (inches):	Is rainfall greater than 0.5"? Inspection Required☐
Inspection Observations	
Petroleum Product Storage Areas: Are all of the temporary and permanent controls contained in Plan in place? ☐ Yes☐ If no, describe the location(s) of deficiencies and corrective actions that must be taken.	
Vehicle Entrances and Exits: Is there tracking of sediment from locations where vehicles enter and leave the project? If yes, describe the location(s) and the corrective actions that must be taken.	
Other Observations	
Is an Erosion, Sedimentation and Pollution Control Plan revision required? ☐ Yes☐ No Date of revision:	
Corrective Actions and Date:	

Signature of Certified Personnel

Printed Name of Certified Personnel

Daily Rainfall Log

Project Name: ______________________________

Project Location: ______________________________

Month: ____________________ **Year:** ______________

Type of Device Used to Measure Rainfall: ______________

Device Location: ______________________________

Daily Rainfall Monitoring Data

Date	Rainfall Amount, Inches	Time	Reported By

Weekly Inspection Report

Inspection performed by certified personnel at least once every seven calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater

Project Information	
Date:	Project Name:
Project Location:	
Name of Inspector:	
Inspection Event	
Regular weekly inspection: ☐	Inspection within 24 hours of 0.5" storm event ☐

Inspection Observations

Disturbed areas that have not undergone final stabilization:

Are all of the temporary and permanent controls contained in Plan in place and properly maintained? ☐ Yes ☐ No

If no, describe the location(s) of deficiencies and corrective actions that must be taken.

Corrective Action Taken and Date:

Material storage areas exposed to precipitation:

Are all of the temporary and permanent controls contained in Plan in place and properly maintained? ☐ Yes ☐ No

If no, describe the location(s) of deficiencies and corrective actions that must be taken.

Corrective Action Taken and Date:

Discharge locations or points.

Are erosion control measures preventing impacts to receiving waters? ☐ Yes ☐ No

If no, describe observations:

Structural control measures:

Are all of the temporary and permanent controls contained in Plan in place and properly maintained? ☐ Yes ☐ No

If no, describe the location(s) of deficiencies and corrective actions that must be taken.

Control Measures	Location	Deficiency	Date Corrected

Other observations:

Is an Erosion, Sedimentation and Pollution Control Plan revision	☐	☐	Date of

Signature of Certified Personnel

Printed Name of Certified Personnel

Sheet_____of _____

Month:_____ Year:_____
Submit to EPD by 15th of Following Month

Project Location:_____ Project Location: _____

Storm Water Monitoring Data

To be used within 24-hours of a qualifying rainfall event of 0.5-inches or more.

Date Sampled	Rainfall Amount (Inches)	Exact Location of Sample	Time Sampled	Sampling Technique (Manual or Automatic Grab)	Sampled by	Date of Analysis	Time Analyzed	Analyzed By	Analytical Technique or Method Used (Meter #)	Results (NTU)

I certify that all sampling and analysis was conducted as per the Plan. __

Signature of Certified Personnel)
(

Monthly Inspection Report

Inspection performed by certified personnel at least once per month

Project Information	
Date:	Project Name:
Project Location:	
Inspection Observations	
Rainfall within past 24 hours (inches):	Is rainfall greater than 0.5"? Inspection Required ☐
Inspection Observations	
Areas that have undergone final stabilization: Are all permanent stabilization controls contained in Plan in place? ☐ Yes ☐ No If no, describe the location(s) of deficiencies and corrective actions that must be taken.	
Other observations: Are pollutants entering the drainage system or receiving waters? ☐ Yes ☐ No If yes, describe the location(s) and the corrective actions that must be taken. Are all erosion and sediment control measures operating properly? ☐ Yes ☐ No If no, describe the location(s) and the corrective actions that must be taken.	
Other Observations	
Is an Erosion, Sedimentation and Pollution Control Plan revision required? ☐ Yes ☐ No Date of revision:	
Corrective Actions and Date:	

Signature of Certified Personnel

Printed Name of Certified Personnel

Inspection Summary

Site:_____ **LDA No.**_____

Map Site	Violation	First Date	Date Corrected

Site
Inspection
Report

Erosion and Sedimentation Inspection Report

Maintain Reports on-site

Site:	**Date:**	**Time:**
Inspector:	**Accompanied By:**	
Stage of Construction:		
Site:		
Observation:		
Recommendations:		
Contractor's Corrective Action (and Date):		
Site:		
Observation:		
Recommendations:		

Contractor's Corrective Action (and Date):

SECTION 02485

SODDING

PART 1 — GENERAL

1.01 SECTION INCLUDES

A. This section includes the Contractor's responsibility to furnish all labor, materials, equipment, and incidentals necessary to place sod and maintain all sodded areas disturbed by the Contractor's operations.

B. Work includes all soil preparation, soil additives, and the storage, transportation, placing, and maintenance of sod at all locations as required or as directed by the Owner's Representative.

C. See GSWCC Ds3 and Ds4 Requirements for Regulatory Compliance

1.02 RELATED SECTIONS

Section 02276: Site Restoration and Erosion Control

1.03 SUBMITTALS

A. Product labels/data sheets.

B. Certification of sod; include source and harvest date of sod, and sod seed mix.

C. Proof of Georgia Live Plant license

1.04 DELIVERY, STORAGE, AND PROTECTION

A. Sod:

1. Do not harvest if sod is excessively dry or wet to the extent survival may be adversely affected.
2. Harvest and deliver sod only after laying bed is prepared for sodding.
3. Roll or stack to prevent yellowing.
4. Deliver and lay within 64 hours of harvesting.
5. Keep moist and covered to protect from drying from time of harvesting until laid.

1.05 WEATHER RESTRICTIONS

Perform Work under favorable weather and soil moisture conditions as determined by accepted local practice.

1.06 GUARANTEE

A. Establish an acceptable growth of the specified sod on all areas as directed by the Owner's Representative. An area is considered acceptable if each piece of sod is alive and healthy and generally free from weeds, insects, and disease, producing a complete cover of living grass.

B. The Contractor is responsible for monitoring, watering, weeding, and mowing, the sod during the maintenance period.

1.07 MAINTENANCE SERVICE

A. Begin maintenance immediately after each area is planted and continue for a period of 60 days after all planting under this section is completed, or an acceptable stand of grass is established

B. Perform maintenance operations during maintenance period to include:

1. Monitoring for drying, displacement, damage

2. Watering: First 2 weeks water daily, (factoring in impact of rainfall), thereafter keep surface moist

3. Washouts: Repair by filling with topsoil, liming, fertilizing, and resodding.

4. Mowing: Mow to 2 inches after grass height reaches 3 inches, and mow to maintain grass height from exceeding 3-1/2 inches.

5. Re-sod unsatisfactory areas, or portions thereof, immediately at the end of the maintenance period if an acceptable stand has not been produced.

PART 2 — PRODUCTS

2.01 SOD

A. New sod consisting of live, dense, well rooted growth; well suited for the intended purpose and soil conditions; completely free of noxious weeds and grasses (crab grass, quack grass, Johnson grass, Canada thistle); and containing less than 5 plants of objectionable weeds per 100 square feet.

B. Provide sod machine cut to pad thickness of 3/4" (+1/4"), excluding top growth and thatch. Provide only sod capable of vigorous growth and development when planted (viable, not dormant).

C. Provide sod of uniform pad sizes with maximum 5% deviation in either length or width. Broken pads or pads with uneven ends will not be acceptable. Sod pads incapable of supporting their own weight when suspended vertically with a firm grasp on upper 10% of pad will be rejected

D. Obtain all sod from an approved nursery with a Georgia Live Plant license.

E. Replacement sod will match existing lawn grass type.

2.02 FERTILIZER

Commercially manufactured, Grade 10-10-10; furnished in standard containers clearly marked with the name, weight, and guaranteed analysis of the contents and ensuring proper protection in transportation and handling; and in compliance with all local, state, and federal fertilizer laws.

2.03 AGRICULTURAL LIMESTONE

Containing a minimum of 85 percent calcium carbonate and magnesium carbonate combined, 85 percent of which passes a No. 10 mesh sieve.

PART 3 - EXECUTION

3.01 PREPARATION

A. Place sod as soon as practical after its removal from point of origin. Keep it moist while displaced.

B. Scarify each area to be sodded a minimum of 2 inches and remove stones larger than 3/4 inch in any dimension.

C. Before beginning sodding operations in any area, complete placing the topsoil and final grading, and have the area approved by the Owner's Representative.

3.02 APPLICATION

A. Set sod between April 1 and October 31 and when the soil is in a workable condition. If weather is acceptable to the Owner's Representative, the dates may be extended beyond those stated.

B. Do not set sod out of season unless soil conditions are favorable and written permission is obtained from the Owner's Representative.

C. During times when sodding cannot be conducted, erosion control and silt fences shall be placed and maintained. If property owner and the Project Manager agree, seeding may be substituted for sodding.

D. Apply fertilizer and agricultural limestone uniformly over the sod bed at the suggested rates shown below. The actual application rates shall be determined by the applicator and guaranteed by the applicator to produce an acceptable and healthy stand of grass. Immediately prior to placing sod, water the sod bed until it is saturated to a depth of 1 inch, and keep it moist until the sod is placed.

1. Fertilizer: 15 pounds per 1,000 square feet of 10-10-10.

2. Agricultural Limestone: 40 pounds per 1,000 square feet.

E. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod strips; to not overlap. Stagger strips to offset joints in adjacent courses. Work from boards to avoid damage to subgrade or sod. Tamp or roll lightly to ensure contact with subgrade. Work sifted soil into minor cracks between pieces of sod; remove excess to avoid smothering of adjacent grass. Lay sod on slopes with short dimension running up and

down.

F. Saturate sod with fine water spray within 2 hours of planting.

1. Two weeks after the sod is installed, top dress and thoroughly water it. Top dressing shall consist of the following: 1/2 to 1 Pound: 38 percent urea formaldehyde per 1,000 square feet.

2. 20 Pounds: 6-12-12 per 1,000 square feet.

G. Reconditioning Existing Lawns:

1. Recondition existing lawn areas damaged by Contractor's operations including storage of materials and equipment and movement of vehicles. Also recondition existing lawn areas where minor re-grading is required.

2. Provide fertilizer, sod and soil amendments as specified for new lawns and as required to provide a satisfactorily reconditioned lawn. Provide new topsoil as required to fill low spots and meet new finish grades.

3. Cultivate bare and compacted areas thoroughly to provide a satisfactory, planting bed.

4. Remove diseased and unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations including oil drippings, stone, gravel and other loose materials.

5. Water newly planted areas and keep moist until acceptable grass stand is established.

3.03 MAINTENANCE

A. Begin maintenance immediately after sodding and continue until final acceptance of the Contract per Paragraph 1.7 above.

B. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations, such as rolling, re-grading and replanting, as required to establish an acceptable lawn, smooth and free of stones, weeds, and eroded or bare areas.

3.04 INSPECTION

A. The Owner’s Representative shall inspect the sod within 30 days after installation and determine if it is acceptable.

B. The Owner’s Representative will again review the sod for acceptance 30 and 60 days after installation. This acceptance by the Owner is for the purposes of payment only.

3.05 PROTECTION

No equipment, material storage, construction traffic, etc., will be permitted on newly sodded areas. Contractor is responsible for providing effective protection. Contractor shall repair all damage.

3.06 CLEANING

Dispose of all surplus material in compliance with all applicable laws and regulations and in accordance with contract requirements.

END OF SECTION

SECTION 02486

SEEDING

PART 1 — GENERAL

1.01 SECTION INCLUDES

A. This section includes the Contractor's responsibility to furnish all labor, materials, equipment and incidentals necessary and place seed and maintain all seeded areas as specified herein including all areas disturbed by the Contractor's operations.

B. GSWCC Ds3 and Ds4 Requirements for Regulatory Compliance

1.02 RELATED SECTIONS

A. Section 02276: Site Restoration and Erosion Control

1.03 SUBMITTALS

A. Product labels/data sheets

B. Seed: Certification of seed analysis, germination rate, and inoculation:

1. Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America.

2. Certify each lot of seed has been tested by a testing laboratory certified in seed testing, within 6 months of date of delivery, Include with certification:

   a. Name and address of laboratory

   b. Date of test

   c. Lot number for each seed specified

   d. Test Results:

      1) name,

      2) percentages of purity and of germination, and

      3) weed content for each kind of seed furnished

3. Mixtures: Proportions of each kind of seed

1.04 GUARANTEE

A. Secure an acceptable growth of grass in all areas designated for seeding If the planting is less than 50 percent successful, rework the ground, re-fertilize, reseed, and re-mulch the entire area.

B. The Contractor is responsible for monitoring, watering, weeding, and mowing, the grass stand during the maintenance period.

1.05 MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until final acceptance of the Contract or an acceptable stand of grass is established and accepted.

B. Maintenance is necessary to help establish a good healthy uniform growth over the entire seeded area. Maintenance to be performed includes the following:

1. Watering: First 2 weeks every day, (factoring in impact of rainfall), thereafter keep surface moist.

2. Washouts: Re-grade and re-seed at the Contractor's expense until acceptable stand is established.

3. Mulch: Replace wherever and whenever washed or blown away

4. Mowing:

   a. Mow to 2 inches after grass height reaches 3 inches, and mow to maintain grass height from exceeding 3-1/2 inches.

5. Rake clippings and leaves, and appurtenances until the project is completed or an acceptable stand of grass is established and accepted.

PART 2 - PRODUCTS

2.05 MATERIALS

A. Products and applications to match Contract application period and meet manufacturers recommendations, or as recommended by soil sample analysis.

B. Fertilizer shall be a complete commercial fertilizer. It shall be delivered to the site in the original unopened containers each showing the manufacturer's guaranteed analysis of the contents and ensuring proper protection in transportation and handling, and in compliance with all local, State, and Federal fertilizer laws. Store fertilizer, so when used, it shall be dry and free flowing.

C. Lime shall be ground limestone containing not less than 85 percent calcium and magnesium carbonates.

D. Seed shall be from the same or previous year's crop; each variety of seed shall have a percentage of germination not less than 90, a percentage purity of not less than 85, and shall have not more than one percent weed content.

E. The mixture for lawn areas shall consist of seed proportioned by weight as indicated on the drawings and shall match existing species unless directed otherwise by Owner's Representative.

F. Grass seeding shall match the existing adjacent grass of previously landscaped areas unless directed otherwise by the Owner's Representative.

PART 3 - EXECUTION

3.01 PREPARATION

A. Soil samples to be obtained and processed at the Contractor's expense to determine lime requirements.

B. Agricultural lime is suggested at the rate of one to two tons per acre unless soil tests indicate otherwise. Graded areas require lime application. Agricultural lime shall be within the specifications of the Georgia Department of Agriculture. The actual application rate shall be determined by the applicator and guaranteed by the applicator to produce an acceptable and healthy stand of grass.

C. Fertilizer shall be applied at the rate as shown per the drawings or at minimum follow the guidelines within the Georgia Manual for Erosion and Sediment Control latest edition. The actual application rate shall be determined by the applicator and guaranteed by the applicator to produce an acceptable and healthy stand of grass.

3.02 INSTALLATION

A. Grading and shaping will be required to promote positive drainage. Vertical banks shall be sloped to enable plant establishment. Concentrations of water will cause excessive soil erosion and shall be diverted to a safe outlet. Diversions and other treatment practices shall conform to the appropriate standards and specifications.

B. The subgrade of all areas to be seeded shall be raked and all rubbish, sticks, roots and stones shall be removed.

C. Lime shall be spread evenly over surface and thoroughly incorporated as required.

D. Fertilizer shall be uniformly spread and immediately mixed with the upper 2 inches of the soil.

E. Seeding

1. Hydraulic Seeding: Mix the seed (inoculated if needed), fertilizer, and wood cellulose or wood pulp fiber mulch with water and apply in slurry uniformly over the area to be treated. Apply within one hour after the mixture is made.

2. Conventional Seeding: Seeding will be done on a freshly prepared and firmed seedbed. For broadcast planting, use a culti-packer-seeder, drill, rotary seeder, other mechanical seeder, or hand seeding to distribute the seed uniformly over the area to be treated. Cover the seed lightly with 1/8 to 1/4 inch of soil for small seed and 1/2 to 1 inch for large seed when using a culti-packer or other suitable equipment.

F. Mulching: Mulching is required for all permanent vegetation applications. Mulch applied to seeded areas shall achieve 75% to 100% soil cover.

END OF SECTION

SECTION 02500

LINING WITH CURED-IN-PLACE PIPE (CIPP)

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. The rehabilitation of a full length of an existing sewer main, from manhole to manhole, and partial/segmental/point repairs by the trenchless method known as Cured-In-Place Pipe (CIPP) lining.

1. CIPP consists of:

   a. Installing a resin-impregnated flexible tube, either inverted or pulled into the existing sewer main,

   b. Expanding the tube to fit tightly against the interior diameter of the main it was installed in by the use of water or air pressure.

   c. Curing/hardening the resin by elevating the temperature of the fluid (water/air) used for the inflation to a sufficient level for the initiators in the resin to effect a reaction.

   d. The resultant shall be a hard, impermeable pipe within a pipe.

2. Partial/segmental/point repair CIPP shall include lining a limited section of pipe of no less than three (3) linear feet in length or longer

1.02 SCOPE

A. Provide all material, labor, and equipment to rehabilitate the existing sanitary sewer as described herein and shown on the plans.

B. The CIPP process shall provide for the structural and hydraulic renewal of the existing sewer.

1. The CIPP liner shall be smooth, hard, strong and chemically inert.
2. The interior surface shall closely follow the contours of the host pipe.

C. When completed:

1. Re-establish access at manholes
   a. Seal at each manhole shall be watertight.
2. New CIPP liner shall extend from manhole to manhole
3. Re-establish service connections to the sewer. Produce a seal that eliminates

infiltration with an epoxy or resin mixture compatible with the liner resin system. Seal shall be water tight.

1.03 REFERENCES

A. ASTM

1. D543 – Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents
2. D638 - Standard Test Method for Tensile Properties of Plastics. D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
3. D1598 - Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure.
4. D2122 - Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.
5. D2990 - Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics.
6. D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.
7. D2837 - Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products.
8. D5813 - Standard Specification for Cured-In-Place Thermosetting Resin Sewer Piping Systems.
9. F1216 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.
10. F1743 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe.
11. F2019- Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe.
12. F2599 – Standard Practice for the Sectional Repair of Damaged Pipe by Means of an Inverted Cured-In-Place Liner

B. National Association of Sewer Service Companies (NASSCO): Guideline for the use and handling of styrenated resins in cured-in-place-pipe, September, 2008

C. Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards, DeKalb County Department of Watershed Management.

1.04 SECTION NOT USED

1.05 SUBMITTALS

A. Action Submittals (submit for review and approval):

1. Comprehensive Construction Sequencing Plan including:
    a. Work Site Plan including:
        1) Proposed access routes

2) Set up locations for lining installation

3) Wet out area (if required) including:

a) Typical insertion and curing schedule/plan

(1) Submit wet out, insertion and curing plan for each and every lining proposed

(a) Submit minimum 48 hours (2 working days) prior to each installation

b. Site Health and Safety Plan

c. Required Construction Permits

d. Sewer Flow Control Plan in accordance with Section 01520 including:

1) Spill Containment Plan

2) Emergency contingent plan

e. Work schedule

2. Erosion Control Plan in accordance with Section 02276 Site Restoration and Erosion Control.

3. Traffic Control Plan in accordance with MUTCD and GDOT requirements (where applicable).

4. Analysis of design criteria and calculations for CIPP thickness per ASTM F1216 full deteriorated condition.

a. Submit complete data and design calculations for each lining

b. Include installation method statement for each lining including:

1) Repair details for potential sewer defects in conjunction with manholes, joints, laterals and infiltration.

2) Quality Control/Quality Assurances

c. Calculations shall be prepared and stamped by a Professional Engineer in the State of Georgia.

1) Approval of the calculations shall not relieve the Contractor of any contractual obligations.

5. Curing temperature monitoring system shop drawings

6. Submittals / shop drawings for non-shrink grout, hydrophilic end seals and pre-liners to be used and method of installation.

7. Proposed testing procedure including: number, location and sampling methods.

8. Proposed testing laboratory with qualifications, experience history and references.

9. Pre-installation CCTV inspection DVD.

10. Qualification requirements for the Contractor, Installer and personnel (See Item 1.04 Qualifications, this specification)

B. Informational Submittals:

1. Manufacturer's technical literature and certificate demonstrating the materials to be used meet the referenced standards and the requirements of these specifications.

2. Proposed equipment and procedures for accomplishing the cured-in-place pipe lining work.

3. Manufacturer's printed installation instructions including:

   a. Installation method statement including:

      1) Details concerning curing methods,

      2) Inversion pressures necessary for proper installation,

      3) Minimum pressure required to hold tube tight against existing host pipe,

      4) Maximum allowable pressure that will not damage tube,

      5) Type of insertion,

      6) Defect repair:

         a) Methods of repairing in conjunction with manholes,

         b) Joints,

         c) Laterals,

         d) Active infiltration,

         e) Quality control/quality assurance plan,

         f) Repair material test results.

4. Product data and Manufacturer's installation procedures for resin and catalyst system including but not limited to specifications, characteristics, properties, and itemized exceptions and deviations to Specification.

5. Certified test reports on physical properties and chemical resistance of proposed resin

6. Material Safety Data Sheets for all resins, and other additives such as accelerants, colorants, and lubricants utilized in the pipe liner/lining process.

7. Manufacturer's Certificate of Compliance that resin material is appropriate for intended application and in conformance with specifications

8. Certified test reports on physical properties and chemical resistance of

proposed resin

9. Annular space sealant

10. Service connection fittings

C. Project Submittals

1. The Contractor shall submit the following information during the project for the use of CIPP at a particular location:

   a. Field measurements.

   b. Design wall thickness calculations,

      1) Signed and sealed by a professional engineer registered in the state of Georgia and proficient in the design of CIPP systems.

      2) Manufacturer certification of material of CIPP systems.

      3) Manufacturer certification of material to values used in calculations.

2. "Wet-out" Plan: for each proposed lining section:

   a. method for "wet-out" or flexible tube

   b. specific insertion and curing schedule

3. Contractor's procedures and materials for installing the liner and renewing sewer services including time and duration of sewer service unavailability.

4. Sampling procedures and locations for obtaining representative samples of the finished liner.

D. The Contractor shall submit a daily written record as specified in Section 01320 Progress Reports & Videos

1. The Owner's Representative shall certify receipt of the daily record (in email format) noting any items and adding any observations with reference to claims for payment to the Contractor.

2. The Owner's Representative may request a weekly submission in the form of progress report.

   a. Owner's Representative shall provide the Contractor a written request for a weekly progress report.

E. Record drawings, including the identification of the work completed by the Contractor, and the post-installation CCTV shall be submitted within 2 weeks after the project is completed.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Packaging, handling and shipping shall be done in accordance with the

manufacturer's instructions.

1. The Contractor shall be responsible for the delivery, storage, and handling of materials and products.
    a. keep products safe from damage
    b. Promptly remove damaged products from the Work site at the Contractor's expense.
    c. Replace damaged products with undamaged products acceptable to the Manufacturer and Owner's Representative.
    d. Dispose of in accordance with current applicable regulations.
2. No materials or products shall be shipped to the Site of the Work without the agreement of the Owner's Representative.

B. Resin to be shipped directly to wet-out facility from resin manufacturer unless otherwise approved by the Owner's Representative.

C. Store water or steam cured resin-impregnated tubes in refrigerated truck trailers at a temperature below 45 degrees F to prevent premature curing.

D. No cuts, tears, or abrasions shall occur to liner tub.

E. No cuts, tears, or abrasions shall occur to liner tube during handling.

F. Materials shall be accompanied by test reports certifying that the material conforms to the ASTM standards listed herein.

G. The liner wet-out report must be provided for liner material and resin type.

1. The ratio of resin and fabric must be provided by the manufacturer.

1.07 SAFETY

A. Perform work in accordance with OSHA standards and State and Federal safety regulations.

B. No confined space entry will be permitted without the development and implementation of a confined space entry plan:

1. Plan shall be in accordance with OSHA standards
2. Personnel involved shall have current training certificates
3. Entry permit is required prior to entry.

PART 2 - GENERAL

2.01 PRODUCTS

A. Liner pipe shall be cured-in-place pipe (CIPP) similar or equal to the following:

1. Insituform, St., Louis, MO.

2. Granite Inliner, Orleans, IN (formerly Layne Inliner).

3. IPR, The Woodlands, TX.

4. Other proposed liner products must be preapproved by the Owner's Representative.

B. Owner or Owner's Representative shall be entitled to witness the pipe manufacture.

2.02 MATERIALS

A. Flexible Liner Tube:

1. Consist of layers of flexible nonwoven and absorbent polyester felt:

   a. Designed in accordance with ASTM F1216, Appendix X.1.2.2 (Fully Deteriorated Gravity Pipe Condition).

   b. CIPP design shall assume no bonding to the original pipe wall.

   c. Fabricated from materials which when cured will be chemically resistant to reagents as defined in ASTM D543.

2. Manufacturer must have performed long-term testing for flexural creep of the CIP material installed by Subcontractors.

   a. Such testing results are to be used to determine the long-term, time dependent flexural modulus that will be used in product design.

      1) This constitutes a performance test of the tube and resin and general installation and curing workmanship.

   b. A percentage of the instantaneous used in design calculations for exterior buckling.

   c. A percentage of the instantaneous flexural modulus value will be used in design

      1) The percentage or the long-term creep retention value utilized will be verified by this testing.

      2) Retention values exceeding 50 percent of the short term test results will not be allowed.

   d. Materials used shall be of a quality equal to, or better than, the materials used in the long-term test with respect to the initial flexural modulus used in the CIPP design.

3. Layers of cured CIPP shall be uniformly bonded.

   a. Layers that separate cleanly using a probe or point of a knife blade are not acceptable.

   b. Probe or knife blade moving cleanly between layers is not acceptable.

   c. Occurrence of (a) or (b) above will require new samples to be obtained from the installed pipe.

d. Reoccurrence may cause rejection of the Work.

e. Overlapped layers of felt in longitudinal seams that cause lumps in the final product are not acceptable.

4. Capable of stretching to fit irregular pipe sections.

5. Fabricated and sized for each section to ensure snug and firm fit inside existing sewer

   a. Produce required thickness after resin is cured.

   b. After installation there shall be no wrinkles or permanent fins formed.

6. Inside layer of tube shall be coated with an impermeable material compatible with resin and felt.

7. Maximum Stretching Allowance: In accordance with ASTM F1216.

8. Fabricate in lengths such that liner occupies length of pipeline between launch and reception manholes.

9. Where several layers of felt are required, inner layer shall be stitched to form a tube.

   a. Each successive layer shall be individually wrapped around previous one and stitched together.

   b. Outer layer of felt shall have an installation tube pre-bonded to it, or a sheet of this material shall be wrapped around completed felt tube.

      1) Where a pre-bonded material is used, bond a covering strip over seam to form airtight joint.

B. Pre-liner:

1. Polypropylene compatible with resin system used for the CIPP:

   a. Shall not adversely affect adhesive properties of resin used in mainline or lateral liners.

   b. May be used (if required) to eliminate/control infiltration during CIPP installation.

C. Interior Pipe Wall Color: Shall not be a dark or non-reflective nature that could inhibit proper closed circuit television (CCTV) inspection.

D. Prior to design and manufacture of the liner,

1. Obtain all the information needed for to be provided for design including:

   a. condition of the host pipe,

   b. Host pipe:

      1) Diameter,

      2) Ovality,

      3) Deflection,

      4) Length

5) Bury conditions,

6) Soil type,

7) Soil loading factor

8) Hydrostatic load,

E. Design liner thickness using the following criteria:

1. Design Life: 50 Years
2. Pipe Diameters: Per Contract Drawings
3. Ovality: 2%
4. Pipe Condition: Fully deteriorated
5. External Water: Ground surface if not specified on the Contract Drawings
6. Flexural Strength: 4,500 psi
7. Short Term Flexural Modulus: 250,000 psi
8. Reduction Factor: 50%
9. Long Term Flexural Modules: 125,000 psi
10. k Enhancement Factor: 7.
11. Soil Modules: 1,000 psi
12. Soil Density: 125 pcf
13. Highway Live Load: AASHTO H-25
14. Safety Factor: 2 minimum
15. Minimum Thickness- The liner thickness of each pipe segment shall be determined by the Contractor and submitted per Paragraph 1.05 of this Section. The minimum CIPPL design thicknesses are listed below.

6” – 10” Dia	6 mm
12”-15” Dia	7.5 mm
18” Dia.	9 mm
21” Dia	10.5 mm
24” Dia.	12 mm

a. If calculations require thicker wall, round to next higher multiple of 0.5 millimeters.

16. Poisson’s Ratio: 0.3
17. Minimum length Partial/Segmental/Point Repair liners to be 8 feet. Repair shall effectively span the distance from the adjacent pipe joint plus one (1) foot unless otherwise directed by the Owner’s Representative

    a. Calculated lengths longer than 8 feet will govern.

18. Liner shall be watertight

19. Produce cured tube resistant to shrinkage, not corrode or oxidize, and resistant to abrasion from solids, grit, and sand in wastewater.

2.03 RESIN

A. Resin:

1. Corrosion-resistant polyester, vinyl ester or epoxy system including all required catalysts, initiators or hardeners.

    a. When cured within the tube create a composite that satisfies the requirements of ASTM F1216 and ASTM F1743.

    b. The physical properties specified herein and those which are to be utilized in the design of the CIPP for this Project.

2. Shall produce a CIPP that will comply with the structural and chemical resistance requirements of this Specification.

    a. Styrenated resins are allowed. General purpose, unsaturated, polyester, epoxy, isophtalic neopentyl glycol, or thermosetting vinyl ester resin, catalyst system, initiators, or hardeners that provide specified cured physical strengths and properties, and

3. Compatible with reconstruction inversion process.

4. Resin used for a partial/segmental/point repair:

    a. Epoxy resin providing the specified cured physical strengths and properties.

    b. Compatible with reconstruction inversion process

    c. Unless otherwise directed by the Owner's Representative.

5. Resistant to municipal wastewater environment including:

    a. Immersion in raw septic sewage at temperatures up to 75 degrees F.

6. Curing:

    a. Designed to cure properly within selected curing method.

    b. Initiation Temperature: 180 degrees F, maximum.

7. Resistant to ultra-violet light (sunlight) prior to installation.

8. Only neat resins are acceptable.

    a. PET resins, resin filters, resin additives, and resin enhancement

agents are prohibited.

b. Old resins and reworked resins are prohibited,

1) Regardless of whether or not they are mixed with new resin.

9. Chemical resistance of resin system shall have been tested by resin manufacturer in accordance with ASTM D543.

a. Exposure to chemical solutions listed below at temperatures of up to 75 degrees F shall be conducted for a minimum period of 1 month

1) Resulting in a loss of not more than 20 percent of initial structural properties.

b. Minimum Chemical Solution Concentration, ASTM F1216:

1) Tap Water, pH 6 to 9: 100 percent.

2) Nitric Acid: 5 percent.

3) Phosphoric Acid: 10 percent.

4) Sulfuric Acid: 10 percent.

5) Gasoline: 100 percent.

6) Vegetable Oil: 100 percent.

7) Detergent or Soap: 0.1 percent.

c. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction.

1) CIPP samples with and without plastic coating shall meet these chemical testing requirements.

10. CIPP Field Samples:

a. Submit test results from field installations of the same resin system and tub materials as propose for the actual installation.

b. Test results must verify that CIPP physical properties specified have been achieved in previous field applications.

B. Catalyst:

1. Primary: 1 percent maximum of resin by volume.

2. Secondary: 1/2 percent maximum of resin by volume.

C. Hydrophilic End Seals

1. Hydrotite, Greenstreak, Inc.

2. Ultra Seal, Adeka Corporation.

3. Insignia, LMK Technologies

2.04 SOURCE QUALITY CONTROL

A. At time of manufacture, each lot of liner shall be inspected and certified to be free of defects.

B. Mark inside of tube in at least one location per setup.

1. Mark shall include manufacturer of liner, at regular intervals, not to exceed 5 feet, along full length.

PART 3 - EXECUTION

3.01 PREPARATION

A. The following installation procedures shall be adhered to unless otherwise approved by the Owner's Representative.

1. Carry out all operations in accordance with Federal, State, and local safety laws, regulations, standards, policies, and procedures including those promulgated by OSHA and those recommended by the manufacturer.
    a. Particular attention is drawn to those safety requirements involving entering confined spaces (follow OSHA requirements) and steam curing.
        1) Curing with pressurized steam creates additional safety concerns including:
            a) High temperatures,
            b) Quick burn times,
            c) Potential blow offs,
            d) Others.
        2) take additional precautions to secure the work area
            a) Insure the safety of everyone in or around the curing apparatus.
        3) Before utilizing this curing method:
            a) Submit a written copy of the Contractor's standard operating and safety procedures for this methodology to the Owner's Representative.
            b) Submittal to go to the Owner's Representative
            c) Address all safety concerns in the submittal
            d) Identify how/where OSHA requirements are addressed in the submitted procedures.
2. The Contractor shall bypass wastewater around the sewer segment or sewer segments designated for lining as specified in Section 01520 –Sewer Flow Control.
    a. Bypass system shall include accommodating flow from mainlines and service laterals as required
    b. Service connection effluent (laterals) may be plugged only after proper

notification to the affected properties.

c. The Contractor is responsible for any overflows that occur due to his operations.

1) Damage/cleanup shall be completed by the Contractor at no additional expense to the project.

3. Do not install liner if ground water temperatures and/or ambient temperatures are excessive for the manufacturer's recommended installation procedures.

B. Where practicable, liners may be installed in continuous runs through manholes where there are two or more continuous sewer segments, especially to connect several short segments with a continuous lining.

1. Furnish a detailed traffic control plan and all labor and equipment necessary if required to complete installation.

2. Maintenance of traffic and associated traffic control measures meeting the Traffic control Measurement and Payment section shall be paid separately.

3.02 PRE-INSTALLATION PROCEDURES

A. Locate and designate all existing manholes and new manhole access points as necessary for the Work.

1. Provide water from hydrants for cleaning, installation and other process related work items requiring water.

a. Comply with all connection and use requirements for water.

b. Use clean water for inversion and curing.

c. Water procurement shall be in accordance with purveyor's requirements.

2. Locate and mark all existing utilities in areas where excavation is to be performed prior to beginning any excavation.

B. Complete the following activities:

1. Before Work commences:

a. Required pre-installation submittals shall be approved by Owner's Representative, including:

1) Traffic management plan/measures,

2) Safe pedestrian passage,

3) Provision of vehicular access to property,

4) Bypass/diversion pumping,

5) Emergency measures/contingent plans.

b. Submit an Installation Access Plan including:

1) Access manhole location(s)

2) Site plan sketch showing dimensions of access within work limits and utilities

3) Approximate installation rate (ft/day)

4) Appropriate excavation/backfill/resurfacing procedures including permits according to Georgia Dept. of Transportation and governing agency standards.

2. Pre-insertion Cleaning:

a. Clean sewer pipe before pre-insertion television inspection.

1) Immediately before installation of the lining complete a high pressure flush and vacuum in sewer sections to be rehabilitated and repaired including pertinent manholes.

2) Remove any root, grease buildup and any other obstruction that may interfere with the lining operation.

b. Debris removed from sewer during cleaning shall be transported in watertight containers and disposed of in accordance with local, State, and Federal Regulations.

3. Pre-insertion CCTV Inspection:

a. In accordance with Section 01510 Sanitary Sewer Main Television and Sonar Inspection (CCTV)

b. Inspect sewer pipe before insertion of resin impregnated tube to ensure pipe is clean and existing pipe conditions are acceptable for lining.

1) Any notable condition that could affect the lining operation will be removed/repaired prior to initiating the lining.

c. Line Obstructions: If pre-insertion CCTV inspection reveals obstruction in existing pipe that cannot be removed by sewer cleaning equipment, with approval of Owner's Representative, perform point repair using flexible coupling.

4. Ensure proper sequence of work occurs between mainline and lateral lining activities.

5. Confirm accurate location and serviceability of existing lateral or service connection (tap). Serviceability shall be confirmed by flowing water, dye testing, or visually with CCTV inspection.

a. Dye Testing: Where sewer line segments may contain abandoned services, Contractor may be directed by Program Manager to perform dye testing to determine if services are live and require reinstatement.

b. When service connections protrude into existing pipe more than 1/2 inch, as measured from inside pipe wall, remove protruding portion of service connection to within 1/2 inch of inside pipe wall.

3.03 INSTALLATION

A. Verify diameters and lengths in field before manufacturing and cutting liner to length

B. Install in accordance with ASTM F1216, Section 7 or ASTM F1743, Section 6.

1. Active infiltration must be removed prior to insertion of the liner.

C. Resin Impregnation (Wet-Out):

1. Quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for:
    a. Polymerization shrinkage
    b. Loss of resin during installation through cracks and irregularities in the original pipe wall.
2. Tube shall be vacuum impregnated with resin (wet-out) under controlled conditions.
    a. Designate vacuum-impregnated location prior to CIPP installation
    b. If requested, allow Owner's Representative to inspect materials and procedures used to vacuum impregnate tube.
    c. The point of vacuum shall be no further than 25 feet from the point of initial resin introduction.
        1) After vacuum in the tube is established, a vacuum point shall be no further than 75 feet from the leading edge of the resin.
        2) The leading edge of the resin slug shall be as near to perpendicular to the longitudinal axis of the tube as possible.
    d. If Contractor uses an alternative method of resin impregnation, method shall produce the equivalent results of a roller system.
        1) Proposed alternative shall be documented to Owner's Representative's and Program Manager's satisfaction that saturation of CIPP is sufficient.
    e. Handle resin impregnated tube to retard or prevent settling until it is ready for insertion.
3. Use roller system to uniformly distribute resin throughout tube.
4. Complete wet-out process control sheet for every lining completed. Control sheet shall provide the following information:
    a. Liner manufacturer
    b. Liner diameter
    c. Number of layers
    d. Resin manufacturer

e. Resin amount

f. Resin type

g. Batch number

h. Catalyst and accelerator name/type

i. Hardener name/type

j. Percent of filler, if any

k. Mixing ratios

l. Vacuum pressure of impregnation process

m. Wet-out start time and date

D. Insertion

1. Dewater existing host pipe for CIPP installation as required.

2. Insert wet-out tube through existing manhole or approved access point by means of an inversion process and application of hydrostatic head sufficient to extend tube to next designated manhole or termination point.

    a. Alternately, tube may be pulled into place and expanded with inflation bladder.

        1) Insertion method shall not result in abrasion or scuffing of the tube.

3. Once installation has begun, maintain pressure between minimum and maximum pressures until installation has been completed.

    a. Pressure shall be sufficient to hold tube tight against host sewer pipe.

4. Place temperature gauges between tube and host pipe's invert position to monitor temperature during cure cycle. VeriCure monitors are to be used when requested by Owner or Owner's Representative.

5. CIPP shall be continuous over entire length from manhole to manhole.

6. Complete installation process control sheet for every lining completed. Control sheet shall provide the following information:

    a. Liner length.

    b. Hydrostatic head at point of inversion.

    c. Hydrostatic head at termination point.

    d. Time inversion process started.

    e. Time cutting ends started.

    f. Time cutting laterals started.

    g. Number of laterals cut.

E. Inflation Bladder Removal: For pulled-in-place installation techniques where

inflation bladder is designed not to bond to CIPP, remove bladder material from CIPP

F. Curing:

1. Complete curing process control sheet for every lining completed.
2. Control sheets shall provide (as outlined in ASTM F1216):
    a. Include manufacture recommended temperatures and time for the different steps of curing process;
    b. Initial cure,
        1) Initial cure may be considered completed when exposed portions of flexible tube pipe take a hard set and temperature is adequate
    c. Post cure,
    d. Cooling
3. After installation, apply steam, or hot water as recommended by liner manufacturer.

    a. Steam:
        1) Provide safety system specifically structured for use of steam.
        2) Thermoset Resin: Designed to cure properly when using steam.
        3) CIPP Tube Thermoplastic Coating:
            a) Formulated from material designed specifically to withstand high temperature curing process utilizing steam.
            b) Polypropylene/polyethylene blend or equal.
        4) Equipment:
            a) Heat source shall be capable of delivering steam throughout section and uniformly raising steam temperature above temperature required to affect cure of resin.
            b) Install temperature gauges in the following areas:
                (1) Incoming steam supply.
                    (a) Outgoing steam supply.
                (2) Between impregnated tube and pipe invert at lining termination point.
                (3) VeriCure monitors are to be used when requested by Owner or Owner's Representative.
        5) Steam Temperature: 230 degrees F, minimum.
        6) Minimum Interface Temperature between Liner and Tube: 120 degrees F.

7) Pressure Required to Keep Tube Inflated: Per manufacturer's instructions.

8) Time: Per manufacturer's instructions.

9) Cool Down:

a) Send air through steam cured CIPP liner until liner cools down to 120 degrees F interface temperature.

b) Once 120 degrees F has been reached, water may be introduced to finish cooling line down to 90 degrees F.

c) During release of water, prevent vacuum that could damage newly installed CIPP.

b. Hot Water:

1) Provide safety system specifically structured for use of hot water.

2) Thermoset Resin: Designed to cure properly when using hot water.

3) CIPP Tube Thermoplastic Coating:

a) Formulated from material designed specifically to withstand high temperature curing process utilizing hot water.

b) Polypropylene/polyethylene blend or equal.

4) Equipment:

a) Heat source shall be capable of delivering hot water throughout section and uniformly raising water temperature above temperature required to affect cure of resin.

b) Install temperature gauges in the following areas:

(1) Incoming water supply.

(2) Outgoing water supply.

(3) Between impregnated tube and pipe invert at lining termination point.

5) VeriCure monitors are to be used when requested by Owner or Owner's Representative. Minimum Interface Temperature between Liner and Tube: 120 degrees F.

6) Time: 3 hours, minimum.

7) Cool Down:

a) Introduce cool water into CIPP to replace water being drained from small hole made in downstream end.

b) Cool liner to temperature below 90 degrees F before relieving hydrostatic head.

c) During release of water, prevent vacuum that could damage newly installed CIPP.

G. Manholes

1. CIPP terminating in manhole shall be cut in shape and manner approved by Owner's Representative.

2. Seal pipe opening and fill in annular space using products specified in Part 2 Products – Non-shrink Grout / Hydrophilic End Seals

   a. CIPP connections at manhole opening shall be watertight seal.

   b. Install seal per manufacturer's instructions.

   c. Recheck seal repair after 48 hours. If seal does not hold, continue to repair until there are no leaks.

   d. Channels: When CIPP is installed continuous through manhole create channel per Owner's Representative's Instructions. Do not beak or shear pipe.

H. Inverts:

1. Finish manhole inverts to provide smooth transition between connections.

2. Use CIPP liner material, an approved epoxy, or similar material to form smooth transition to eliminate sharp edges of CIPP, within host pipe, and in manholes at concrete bench and channel invert.

3. Invert rehabilitation shall be compatible with manhole rehabilitation activities.

I. Partial/Segmental/Point Repair CIPP Liners

1. Install partial CIPP liner in accordance with ASTM F2599 and same requirements for full liner.

2. Dimensions of liner shall be fabricated to size, that when installed, will neatly fit circumference of existing pipe.

3. Tube shall be vacuum impregnated with thermo-set resin.

   a. Remove air in tube by vacuum allowing resin to thoroughly impregnate tube.

   b. Retain a resin-impregnated sample of each installation to provide verification of curing process taking place in host pipe.

      1) Hang sample in entry manhole to simulate ambient conditions of host pipe.

4. Insert saturated tube and inversion bladder into carrying device and pull into host pipe.

   a. Pull shall be completed when end of launching device is aligned with

beginning of section to be repaired.

b. Protect resin and tube during pull to ensure no resin is lost by contact with manhole walls or pipe.

1) Resin that provides structural seal shall not contact pipe until positioned at point of repair.

c. Alternative methods of liner insertion and pressurization may be used for products and processes approved by the Georgia Department of Natural Resources and the Owner's Representative,

1) When the final cured-in-place product meets the intent of ASTM F1216.

2) Installation shall be in accordance with the manufacturer's recommendations and available for verification by the Owner's Representative.

5. Installer shall be capable of viewing the beginning of liner contacting host pipe;

a. Verify exact placement of liner.

6. No measuring from a CCTV counter or estimating will be allowed. Extract tube from carry device by controlled air or water pressure.

a. Hold tube in place against wall of host pipe by pressure until cure is complete

7. The CIPP point repair shall be an ambient cure system

a. Cure period shall be of a duration recommended by the resin manufacturer.

8. The finished pipe shall be continuous over the length of the internal point repair,

a. Overlap point repairs if necessary,

b. Be as free as commercially practicable from visual defects such as foreign inclusions, wrinkles, dry spots, pinholes, and delamination.

c. It shall also meet the leakage test requirements.

9. Alternate curing mediums may be used, including, but not limited to steam and ambient cure.

a. End product must meet or exceed the requirements of this section.

b. Alternate curing mediums and alternate installation methodologies must be submitted for approval to the Owner's Representative prior to the bid opening date as specified in the bid documents.

c. Notification of approval (or rejection) shall be made prior to bid opening.

d. When alternate curing mediums and/or alternate installation methodologies are approved for use,

1) Follow all of the manufacturer's recommendations for installation and curing,

2) No exceptions shall be permitted.

10. Should the Owner's Representative require a sample from the partial/segmental/point repair once sampling piece is cured and inflation bladder is deflated,

a. Remove bladder and launching device from host pipe.

b. Remove materials used in installation other than CIPP liner from host pipe.

c. Recover sample piece and label with upstream and downstream manhole numbers and footage from downstream manhole.

J. Service Lateral Re-Instatement:

1. Reconnect service connections using CCTV and a robotic cutter device to field locate laterals, reinstate, and determine number of service connections.

a. Service interruptions shall not exceed 8 hours.

b. Existing sewer service laterals will be internally reinstated to 100% of their pre-CIPP flow diameter.

c. The finished opening shall be smooth with no ragged edges and shall prevent clogging or blockages.

2. Do not reconnect services from abandoned or vacant lots

3. Unless otherwise directed by the Owner's Representative Show distance from nearest downstream manhole to reconnected service on record drawings

4. Recover coupons at downstream manhole and remove.

5. When a remote cutting device is used and a cleanout is available, then a mini-camera down the service may also be used to assist the operator in cutting or trimming.

6. All service lateral reinstatements will be wire brushed to eliminate burrs and snags.

3.04 POST INSTALLATION

A. CIPP installation shall be free from visual defects such as foreign inclusions, dry spots, keel, boat hull, pinholes, wrinkles, and other deformities.

1. Defects and deformities may, at discretion of the Owner's Representative, be cause for rejection of entire liner.

a. Correct failed CIPP and defective CIPP from post installation television inspection or test reports for structural values or thickness as determined by the Owner's Representative.

b. Method of repair,

c. May require field or workshop demonstration,

d. Requires approval by the Owner's Representative prior to commencement of Work

2. Remove and replace pipe identified with defects or deformities at the Contractor's expense.

B. Both ends of the cured Liner shall be cut smoothly 2" from the inlet and outlet points in the manhole.

1. Sealed with an epoxy or resin mixture compatible with the Liner/resin system,
2. Providing a watertight seal.
3. Sealing material and installation method shall be submitted and approved by the Owner's Representative prior to start of construction.
4. Hydraulic cements and quick-set cement products are not acceptable.

C. Where liners of any type are installed in two or more continuous manhole to manhole segments,

1. Liner invert through the intermediate manholes shall be left intact.
2. Final finishing of the installation in intermediate manholes shall require removal of the top of the exposed liner
3. Neatly trimming of the liner edge where it touches the lip of the manhole bench.

D. Portions of any piece of liner material removed during installation shall be available for inspection and retention by the Owner's Representative.

1. All manhole drop connections shall be reviewed on an individual basis. Reinstate openings for all drop assemblies after relining mainline sewer.
2. Outside drop assemblies shall be lined with a cured-in-place liner compatible with the mainline liner, for the full length of the drop assembly and bend.
3. Drop assemblies inside manholes are not required to be relined, unless directed by the Owner's Representative.

3.05 SAMPLE TESTING

A. The Contractor shall have an independent testing laboratory analyze finished liner samples taken from manhole cutoffs, service coupons, etc.

1. A minimum of one (1) 12-inch long restrained sample shall be taken from each liner segment installed, or as directed by the Owner's Representative.
2. Physical samples removed for testing shall be individually labeled and logged to record the following:

a. Owner's Project number and title

b. Sample number

c. Segment number of line as noted on plans

d. Date and time of sample

e. Name of Contractor

f. Location and by whom tested

g. Results of test

h. Street name and address

3. Send one sample from each liner segment installed to test in accordance with applicable ASTM standards for:

a. Flexural Modulus,

b. Flexural Strength,

c. Wall thickness shall be conducted, a minimum of three samples per project will be tested.

d. If tests do not meet the minimum values:

(1) Additional samples originally not sent for testing may be required to be tested, as directed by the Owner's Representative.

(2) Contractor bears all costs associated with additional testing.

Property	ASTM Test Method	Minimum Value
Flexural Strength	D790	4,500 psi
Flexural Modulus	D790	250,000 psi
Thickness	D5813	Contract requirement

4. Resin Sampling:

a. Wet-out facility resin mixing equipment shall have a valve downstream of the mixing function and immediately upstream of application of mixed resin of tube where resin samples may be drawn

b. Batch mix facilities, if any, shall provide sampling of mixed batch

c. Submitted "wet-out" schedule cannot be modified without 24-hour notice to Program Manager

d. Resin samples shall be drawn at times determined by Owner's Representative.

e. Perform prior to conducting laboratory tests.

f. Take a wall thickness measurement in accordance with ASTM D2122

g. Make a minimum of four measurements, evenly spaced, on each test

specimen

h. Average thickness shall be equal or greater than required design thickness.

i. Failure of thickness shall be grounds for rejection for CIPP liner.

5. Field thickness testing:

1) Calculate average thickness using measured values.

6. If properties test do not meet the minimum physical and thickness requirements, the CIPP shall be repaired or replaced at the Contractor's expense.

7. All curing, cutting, and identification of samples will be witnessed by the Owner's Representative.

3.06 TELEVISION INSPECTION

A. Perform television survey in accordance with the requirements of Section 01510 – Sanitary Sewer Main Television and Sonar Inspection (CCTV).

1. CCTV shall be performed

a. Prior to installation of the CIPP but after pre-lining cleaning.

b. After installation of CIPP line and the reconnection of all active sewer laterals.

B. Conduct finished inspections continuous over entire length of sewer between manholes within 48 hours of installation

1. Liner shall be free from visual defects, damage, and deflection.

C. No visible infiltration through the liner, at the joints, at the service connections or at the manholes

3.07 TESTING

A. Base acceptance of liner on videotaped CCTV inspection and that defects described in 1, above, do not exist.

a. Corrections of defects or failures identified in post-installation CCTV shall be repaired at no cost to Owner

b. Method of repair shall be approved by Owner's Representative prior to completion of work.

B. Full Length CIPP testing shall be in accordance with Section 02650 – Testing for Acceptance of Sanitary Sewers.

C. Partial/Segmental/Point Repair CIPP testing shall be in accordance with Section 3.06 Television Inspection of this specification.

3.08 ACCEPTANCE

A. Laboratory Testing: one sample shall be sent to an independent laboratory and tested.

1. Preparation and testing standards shall be performed in accordance with the approved submittals.
2. Failure of any test can be grounds for rejection of the CIPP liner.
3. At the direction of the Owner's Representative a second sample shall be tested.

B. Destructive Testing: Where test results of samples from the 12-inch long pipe section are lower than required values, at the direction of the Owner's Representative, Contractor shall cut samples form liner along length of pipe.

1. The size and shape of the samples shall be determined by the Owner's Representative.
2. The Contractor shall repair the CIPP liner and host pipe at no additional cost to the Owner.
3. Failure of test shall be grounds for rejection for the CIPP liner.

C. Resin Sampling: Owner's Representative drawing the samples will arrive unannounced and shall be afforded immediate access to the equipment.

1. Resin sample shall be sent to the independent laboratory and tested.
2. Testing standards shall be performed in accordance with approved submittals.
3. Failure of any test can be grounds for rejection for the CIPP liner.

D. Low-pressure air testing or hydrostatic exfiltration test: acceptance based on successful completion of this test as specified herein.

E. The Contractor shall submit to the Owner's Representative, for acceptance and approval,

1. Two (2) copies of unedited post-installation CD/DVDs Associated certified test reports for each sewer main segment within 10 working days of the Liner installation.
2. No more than one sewer main segment shall be included on a post- installation Inspection CD/DVD or curing report.

F. It is the intent of these specifications the completed liner, with all appurtenances to be essentially equivalent in final quality and appearance to new sewer pipe installation.

1. The conditions of the existing host pipe will be taken into consideration.

G. Where, in the opinion of the Owner's Representative, a defect in the CIPP liner requires removing a section of the CIPP liner, the Contractor shall make all repairs as directed by the Owner's Representative and shall install a segmental liner, compatible with the CIPP liner, to accomplish a continuous finished liner.

1. No separate measurement and payment will be made for such defect repair or for the post-repair segmental liner.

3.09 PRIVATE SERVICE LINE SHUTDOWN

A. Notify Owner's Representative at least 1 week prior to shutdown

B. When it is necessary to shut down a private sewer service line notify building occupants regarding service lateral disconnection by placing a door hanger approved by the Owner's Representative.

1. Place door hangers 48 hours prior to shut down.

C. When service lateral will be disconnected from main for more than 8 hours, lateral shall be positively drained or pumped down.

1. Monitor status of flow and storage
2. Pump lateral more frequently where flows exceed storage capacity of lateral or Contractor provided temporary storage

D. If service lateral cannot be positively drained or pumped down or disconnection of service is anticipated being 8 hours or longer,

1. Contractor shall provide temporary living accommodations for resident at no additional cost to Owner or resident.
2. Temporary living accommodations shall be approved by Program Manager and coordinated through resident and Owner's Customer Support Representative
3. Alternatively, Contractor may supply a temporary bypass pumping system to keep the lateral operational.

E. Notify building occupants when work is complete and uninterrupted service restored

F. Commercial sewer services shall be maintained at all times while the business is open.

G. No sewage from the services or main line shall be discharged on the ground or in waterways.

H. Holding pits or tanks are not allowed unless permitted by Federal, State, and local authorities having jurisdiction.

3.10 CLEANUP

A. After the CIPP liner installation work has been completed and all testing acceptable, the Contractor shall clean up the work area.

1. All excess material and debris not incorporated into the permanent installation shall be disposed of by the Contractor.

    a. The debris and liquids are to be disposed of properly in accordance with all applicable laws.

    b. The local municipality can furnish a letter to the landfill stating the Contractor is authorized to dispose of the non-hazardous materials.

    c. Debris and liquids type and quantities are to be tracked in the daily contractor diary.

    d. Hauling and disposal costs will be borne by the Contractor.

2. The work area shall be left in a condition equal to or better than prior condition.

    a. Disturbed grassed areas shall be seeded or sod placed as directed by the Owner's Representative at no additional cost to the Owner.

    b. The work site restoration work shall be completed in accordance with the requirements of Section 02480 – Site Restoration and Erosion Control.

3.11 DOCUMENTATION

A. The Contractor shall complete work on each asset as assigned via the Owner's Computerized Work Order Management system.

1. Upon start of work, the Contractor shall receive work orders as assigned by the Owner's Representative.

2. The Contractor shall maintain and synchronize the status of each rehabilitation work order issued.

3.12 WARRANTY

A. Material Warranty: A written guarantee of 3 years shall be provided by manufacturer against breakdown of material effectiveness or structural repair elements

B. Workmanship Warranty: The Contractor shall guarantee his work for a warranty period of three (3) years from the date of final acceptance against any leakage, cracking, loss of bond, or other discontinuity as identified.

1. Deficiencies related to material and workmanship shall be repaired by contractor to the satisfaction of the Program Manager and at no additional cost.

2. If repairs are made, then the Contractor shall warrant the work for one (1) year in addition to the original warranty period required by the Contract.

END OF SECTION

SECTION 02501

LINING WITH ULTRA-VIOLET LIGHT FIBERGLASS CURED-IN-PLACE PIPE

PART 1 — GENERAL

1.01 SECTION INCLUDES

A. Work under this section shall include rehabilitating a full length of an existing sewer main, from manhole to manhole, by the trenchless method known as ultra violet cured-in-place-pipe (UV-CIPP) in accordance with these Specifications. CIPP consists of installing a resin-impregnated fiberglass material tube (Liner) that when cured extends the full length of the original pipe and shall provide a structurally sound, smooth, joint-less and watertight pipe.

1.02 REFERENCES

A. ASTM

1. C581 – Standard Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass Fiber Reinforced Structures Intended for Liquid Service.

2. D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.

3. D578/D578M - Standard Specification for Glass Fiber Strands.

4. D618 - Standard Practice for Conditioning Plastics for Testing.

5. D638 - Standard Test Method for Tensile Properties of Plastics.

6. D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

7. D1598 - Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure.

8. D2122 - Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.

9. D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.

10. D2837 - Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products.

11. D2990 - Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics.

12. D3567 - Standard Practice for Determining Dimensions of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings.

13. D 3681 – Standard Test Method for Chemical Resistance of Fiberglass (Glass-Fiber-Reinforced Thermosetting Resin) Pipe in a Deflected Condition.

14. D5813 – Standard Specification for Cured-in Place Thermosetting Resin Sewer Pipe.

15. F1216 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.

16. F1743 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP).

17. F2019 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP).

B. National Association of Sewer Service Companies (NASSCO): Guideline for the use and handling of styrenated resins in cured-in-place-pipe, September, 2008

C. Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards, DeKalb County Department of Watershed Management.

1.03 DEFINITIONS

A. UV-CIPP - Ultra Violet Cured-in-Place-Pipe is defined as a hollow cylinder consisting of a glass reinforced fabric tube impregnated with an ultra violet light sensitive resin. The impregnated tube is cured by the application of ultra violet light. The UV-CIPP is formed within an existing pipe and takes the shape of and fits tightly to the pipe, all as defined in ASTM Standard F1743. The definitions in ASTM Standard F1216, and ASTM F2019 shall also apply.

1.04 SECTION NOT USED

1.05 SUBMITTALS

A. Action Submittals (submit for review and approval):

1. Comprehensive Construction Sequencing Plan including:
    a. Work Site Plan including:
        1) Proposed access routes
        2) Set up locations for lining installation
        3) Wet out area (if required) including:
            a) Typical insertion and curing schedule/plan
                (1) Submit wet out, insertion and curing plan for each and every lining proposed
                    (a) Submit minimum 48 hours (2 working days) prior to each installation
    b. Site Health and Safety Plan
    c. Required Construction Permits

d. Sewer Flow Control Plan in accordance with Section 01520 including:

1) Spill Containment Plan

2) Emergency contingent plan

e. Work schedule

2. Erosion Control Plan in accordance with the DeKalb County Department of Watershed Management Protocol for Providing Erosion and Sedimentation Controls on Construction Projects.

3. Traffic Control Plan in accordance with GDOT requirements (where applicable).

4. Analysis of design criteria and calculations for CIPP thickness per ASTM F1216 full deteriorated condition.

a. Submit complete data and design calculations for each lining

1) Include installation method statement for each lining including:

a) Repair details for potential sewer defects in conjunction with manholes, joints, laterals and infiltration.

b) Quality Control/Quality Assurances

b. Calculations shall be prepared and stamped by a Professional Engineer in the State of Georgia.

1) Approval of the calculations shall not relieve the Contractor of any contractual obligations.

c. Minimum thickness shall be 3 mm.

5. Curing temperature/monitoring system shop drawings

6. Shop Drawings for hydrophilic end seals and pre-liners to be used and method of installation.

7. Proposed testing procedure including:

8. Number, location and sampling methods

9. Proposed testing laboratory with qualifications, experience history and references.

10. Pre-installation CCTV inspection DVD.

11. Qualification requirements for the Contractor, Installer and personnel (See Item 1.04 Qualifications, this specification)

B. Informational Submittals:

1. Manufacturer's technical literature and certificate demonstrating the materials to be used meet the referenced standards and the requirements of these specifications.

2. Proposed equipment and procedures for accomplishing the cured-in-place pipe lining work.

3. Manufacturer's printed installation instructions including:
    a. Installation method statement including:
        1) Details concerning curing methods,
        2) Inversion pressures necessary for proper installation,
        3) Minimum pressure required to hold tube tight against existing host pipe,
        4) Maximum allowable pressure that will not damage tube,
        5) Type of insertion,
        6) Defect repair:
            a) Methods of repairing in conjunction with manholes,
            b) Joints,
            c) Laterals,
            d) Active infiltration,
            e) Quality control/quality assurance plan,
            f) Repair material test results.
4. Product data and Manufacturer's installation procedures for resin and catalyst system including but not limited to specifications, characteristics, properties, and itemized exceptions and deviations to Specification.
5. Certified test reports on physical properties and chemical resistance of proposed resin
6. Material Safety Data Sheets for all resins, and other additives such as accelerants, colorants, and lubricants utilized in the pipe liner/lining process.
7. Manufacturer's Certificate of Compliance that resin material is appropriate for intended application and in conformance with specifications
8. Certified test reports on physical properties and chemical resistance of proposed resin
9. Annular space sealant
10. Service connection fittings

C. Project Submittals

1. The Contractor shall submit the following information during the project for the use of CIPP at a particular location:
    a. Field measurements.
    b. Design wall thickness calculations,
        1) signed and sealed by a professional engineer registered in the state of Georgia and proficient in the design of CIPP systems
        2) Manufacturer certification of material to values used in calculations.

2. "Wet-out" Plan: for each proposed lining section,

   a. method for "wet-out" or flexible tube

   b. specific insertion and curing schedule

3. Contractor's procedures and materials for installing the liner and renewing sewer services including time and duration of sewer service unavailability.

4. Sampling procedures and locations for obtaining representative samples of the finished liner.

B. The Contractor shall submit a daily written record as specified in Section 01320 Progress Reports & Videos

1. The Owner's Representative shall certify receipt of the daily record (in email format) noting any items and adding any observations with reference to claims for payment to the Contractor.

2. The Owner's Representative may request a weekly submission in the form of progress report.

   a. Owner's Representative shall provide the Contractor a written request for a weekly progress report.

C. Record drawings, including the identification of the work completed by the Contractor, and the post-installation CCTV shall be submitted within 2 weeks after the project is completed.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Packaging, handling and shipping shall be done in accordance with the manufacturer's instructions.

1. The Contractor shall be responsible for the delivery, storage, and handling of products.

   a. Keep products safe from damage

   b. Promptly remove damaged products from the work site at the Contractor's expense.

      1) Dispose of in accordance with current applicable regulations.

   c. Replace damaged products with undamaged products acceptable to the Manufacturer and Owner's Representative.

2. No products shall be shipped to the job site without the approval of the Owner's Representative.

B. Resin to be shipped directly to wet-out facility from resin manufacturer unless otherwise approved by the Owner's Representative.

C. Store UV light cured liners in a light proof, cool environment to prevent premature

curing

D. No cuts, tears, or abrasions shall occur to liner tube during handling.

E. All materials shall be accompanied by test reports certifying the material conforms to the ASTM standards listed herein.

1. Materials shall be shipped, stored, and handled in a manner consistent with written recommendations of the manufacturer.
2. The liner wet-out report must be provided for liner material and resin type.
    a. The ratio of resin and fiberglass must be provided by the manufacturer.

F. All damaged materials rejected by the Owner's Representative shall be promptly removed from the project site at the Contractor's expense and disposed of in accordance with current applicable regulations.

1.07 SAFETY

A. Perform work in accordance with OSHA standards and State and Federal safety regulations.

B. No confined space entry will be permitted without the development and implementation of a confined space entry plan.

1. Plan shall be in accordance with OSHA standards
2. Personnel involved shall have current training certificates
3. Entry permit is required prior to entry.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Glass Fibers:

1. The glass fibers shall be corrosion resistant E-CR
2. Each lot of glass fibers liner shall be inspected for defects and tested in accordance with applicable sections of ASTM F2019.

B. Tube (Liner):

1. Any materials not approved by the Program Manager prior to installation into the piping shall be rejected and shall be removed and replaced with approved materials at the Contractor's expense
2. The liner shall have an impervious internal and external coating material to protect the resin from ultra violet light exposure and from contamination during shipping and installation.
3. The fiber glass liner shall be saturated with the appropriate resin using the

resin bath or vacuum suction impregnation methods and prevent the least amount of air entrapment.

4. Manufacture/construct the UV-CIPP using materials and methods that when installed:
    a. Provides a jointless and continuous structurally sound liner
    b. Able to withstand all imposed static, and dynamic loads on a long-term basis.
5. The impregnation of the resin into the glass fiber tube must be performed at the manufacturer's factory.
    a. No on-site wet-out of the tube will be allowed.
    b. The liner shall be designed to meet the contract requirements.
6. The liner shall be sized such that when installed it will tightly fit the internal circumference of the host pipe.
7. The manufacturer shall test raw materials and liner material at various stages of manufacturing.
8. Every finished liner shall be sampled and tested for modulus of elasticity, and wall thickness.
    a. The results will be provided to the Program Manager.
9. The liner shall be seamless so that homogeneous properties are attained throughout the length and circumference.
10. The inner and outer membranes shall be certified styrene gas barriers.
11. All liners shall be packaged in special shipping containers and UV protection foil,
    a. Allowing storage of the resin impregnated liner for up to 6 months, with no need for refrigeration.

C. Design liner thickness using the following criteria:

1. Design Life: 50 Years
2. Pipe Diameters: Per Contract Drawings
3. Ovality 2%
4. Pipe Condition: Fully deteriorated
5. External Water: Ground surface if not specified on the Contract Documents
6. Tensile Strength: 20,000 psi
7. Flexural Strength: 20,000 psi
8. Short Term Flexural Modules: 1,000,000 psi
9. Long Term Flexural Modules: 600,000 psi
10. Reduction Factor: 50%

11. k Enhancement Factor: 7
12. Soil Modules: 1,000 psi
13. Soil Density: 125 pcf
14. Highway Live Load: AASHTO H-25
15. Safety Factor: 2 minimum
16. Minimum Thickness: The liner thickness of each pipe segment shall be determined by the Contractor and submitted per Paragraph 1.05 of this Section. The minimum CIPPL design thicknesses are listed below.

6”- 10” Dia	3 mm
12” – 15” Dia	6 mm
18” - 24” Dia	7 mm

    a. The nominal liner wall thickness shall be constructed to the nearest 0.5 mm increment.

17. Poisson’s ratio: 0.3
18. Liner shall be watertight

D. Resin:

1. General purpose, unsaturated, polyester, epoxy, isophtalic neopentyl glycol, or thermosetting vinyl ester resin including:
    c. Catalyst system, initiators, or hardeners providing specified cured physical strengths and properties,
    d. Compatible with reconstruction inversion process.
2. Resistant to municipal wastewater environment including:
    e. Immersion in septic sewage at temperatures up to 75 degrees F.
3. PET resins, resin fillers, resin additives, and resin enhancement agents are prohibited.
    f. Only neat resins are acceptable.
    g. Old resins and reworked resins are prohibited, regardless of whether or not they are mixed with new resin.
4. Chemical resistance of resin system shall have been tested by resin manufacturer in accordance with ASTM D543.
    h. Exposure to chemical solutions listed below at temperatures of up to 75 degrees F shall be conducted for a minimum period of 1 month and shall result in a loss of not more than 20 percent of initial structural properties.
        1) Minimum Chemical Solution Concentration, ASTM F1216:

a) Tap Water, pH 6 to 9: 100 percent.

b) Nitric Acid: 5 percent.

c) Phosphoric Acid: 10 percent.

d) Sulfuric Acid: 10 percent.

e) Gasoline: 100 percent.

f) Vegetable Oil: 100 percent.

g) Detergent or Soap: 0.1 percent.

5. Produce cured tube resistant to shrinkage, not corrode or oxidize, and resistant to abrasion from solids, grit, and sand in wastewater.

6. Bond between tube layers shall be strong and uniform.

7. Layers, after cure, shall be saturated with resin.

8. The resin color will not interfere with visual inspection of cured liner.

2.02 SOURCE QUALITY CONTROL

A. At time of manufacture, each lot of liner shall be inspected and certified to be free of defects.

B. Mark inside of tube in at least one location per set up.

1. Mark shall include manufacturer of liner, at regular intervals, not to exceed 5 feet, along full length.

C. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction.

1. CIPP samples with and without plastic coating shall meet these chemical testing requirements.

2. CIPP Field Samples:

a. Submit test results from field installations of the same resin system and tub materials as proposed for the actual installation.

b. Test results must verify that CIPP physical properties specified have been achieved in previous field applications.

PART 3 – EXECUTION

3.01 PREPARATION

A. The following installation procedures shall be adhered to unless otherwise approved by the Owner's Representative.

1. Carry out all operations in accordance with all Federal, State, and local safety laws, regulations, standards, policies, and procedures including those

promulgated by OSHA and those recommended by the manufacturer.

a. Particular attention is drawn to those safety requirements involving entering confined spaces (follow OSHA requirements).

1) The Contractor shall take additional precautions to secure the work area and insure the safety of everyone in or around the curing apparatus.

2) Before utilizing this method, the Contractor shall submit a copy of the Contractor's standard operating procedures addressing safety issues for this methodology to the Program Manager.

2. The Contractor shall bypass wastewater around the sewer segment or sewer segments designated for lining as specified in Section 01520 –Sewer Flow Control.

a. Service connection effluent may be plugged only after proper notification to the affected properties.

b. Individual's sewer service shall not be interrupted for more than 8 hours.

1) If proposal is to interrupt service for more than 8 hours alternative means of providing service during construction will be required.

3. Do not install liner if ground water temperatures and/or ambient temperatures are excessive for the manufacturer's recommended installation procedures.

4. Where practicable, liners can be installed in continuous runs through manholes:

a. Where there are two or more continuous sewer segments,

b. Or to connect several short segments with a continuous lining.

c. If a road/lane must be closed to traffic, the Contractor shall furnish a detailed traffic control plan and all labor and equipment necessary.

1) No separate payment will be made for traffic control.

2) It is an incidental part for CIPP installation.

3.02 PRE-INSTALLATION PROCEDURES

A. Complete the following activities, unless otherwise approved by the Program Manager.

1. Perform operations in accordance with OSHA Standards.

2. Before Work commences:

a. Required pre-installation submittals shall be approved by

Owner's Representative, including:

1) Traffic management plan/measures,

2) Safe pedestrian passage,

3) Provision of vehicular access to property,

4) Bypass/diversion pumping,

5) Emergency measures/contingent plans.

b. Submit an Installation Access Plan including:

1) Access manhole location(s)

2) Site plan sketch showing dimensions of access within work limits and utilities

3) Approximate installation rate (ft/day)

4) Appropriate excavation/backfill/resurfacing procedures including permits according to Georgia Dept. of Transportation and governing agency standards.

3. Pre-insertion Cleaning:

a. Clean sewer pipe before pre-insertion television inspection.

1) Immediately before installation of the lining complete a high pressure flush and vacuum in sewer sections to be rehabilitated and repaired including pertinent manholes.

2) Remove any root, grease buildup and any other obstruction that may interfere with the lining operation.

b. Debris removed from sewer during cleaning shall be transported in watertight containers and disposed of in accordance with local, State, and Federal Regulations.

4. Pre-insertion CCTV Inspection:

a. In accordance with Section 01510 – Sanitary Sewer Main Television & Sonar Inspection.

b. Inspect sewer pipe before insertion of resin impregnated tube to ensure pipe is clean and existing pipe conditions are acceptable for lining.

1) Any notable condition that could affect the lining operation will be removed/repaired prior to initiating the lining.

5. Line Obstructions: If pre-installation video CCTV inspection reveals obstruction in existing pipe that cannot be removed by sewer cleaning equipment, with approval of Program Manager, perform point repair using flexible coupling.

6. Ensure proper sequence of work occurs between mainline and lateral lining activities.

7. Confirm accurate location and serviceability of existing lateral or service connection (tap). Serviceability shall be confirmed by flowing water, dye testing, or visually with CCTV inspection.

    a. Dye Testing: Where sewer line segments may contain abandoned services, Contractor may be directed by Program Manager to perform dye testing to determine if services are live and require reinstatement.

        1) The Contractor shall be responsible for the identification and verification of all branch service connections prior to installing the UV-CIPP.

    b. Line Obstructions: If pre-installation video CCTV inspection reveals obstruction in existing pipe that cannot be removed by sewer cleaning equipment, with approval of Program Manager, perform point repair using flexible coupling.

        1) When service connections protrude into existing pipe more than ½ inch, as measured from inside pipe wall, remove protruding portion of service connection to within ½ inch of inside pipe wall.

8. The contractor shall remove, grind or take other precautions necessary to address sharp edges or protrusions that could tear the liner or the protective sheets or films.

9. For pipes where sags exist in the pipe segment:

    a. Water in the sag is to be removed to avoid trapping water between the liner and the host pipe.

3.03 INSTALLATION

A. Verify diameters and lengths in field before manufacturing and cutting liner to length.

B. Install in accordance with ASTM F1216, Section 7 or ASTM F1743, Section 6.

1. Active infiltration must be removed prior to insertion of the liner.

C. Resin Impregnation (Wet-Out)

1. Tube shall be either impregnated with resin either by the resin bath or vacuum suction methods under controlled conditions.

    a. Resin bath impregnation must be performed at the manufacturer's factory.

    b. Vacuum suction impregnation – location must be designated prior to CIPP installation.

c. No onsite wet-out of the tube will be allowed.

d. If requested, allow Program Manager to inspect materials and procedures used to impregnate the tube.

e. If Contractor uses an alternative method of resin impregnation, method shall produce the equivalent results.

1) An alternative resin impregnation method shall be documented to Program Manager and Owner's satisfaction that saturation of CIPP is sufficient.

f. Handle resin impregnated tube to retard or prevent settling until it is ready for insertion.

2. Resin must be uniformly distributed throughout the tube.

a. Use roller system to uniformly distribute resin throughout tube.

3. Volume:

a. Resin shall fill voids in tube material at nominal thickness and diameter; no air spaces or pockets allowed.

b. Adjust by adding excess resin to change resin volume because of polymerization and to allow for migration of resin into crack and joints in original pipe.

4. Complete wet-out process control sheet for every lining completed. Control sheet shall provide the following information:

a. Liner manufacturer

b. Liner diameter

c. Number of layers

d. Resin manufacturer

e. Resin amount

f. Resin type

g. Batch number

h. Catalyst and accelerator name/type

i. Hardener name/type

j. Mixing ratios

k. If vacuum suction method use: pressure of impregnation process

l. Wet-out start time and date

D. Insertion

1. CIPP installation shall be in accordance with applicable ASTM F2019 and manufacturer's specifications.

2. The Contractor and Manufacturer shall provide all appropriate transport, handling and protection equipment to transport the impregnated tube to the project site.

    a. All materials should be protected from the weather and exposure to UV light during the manufacture, storage, transport, and installation.

3. All fabricating and Contractor testing shall be carried out under cover and no materials shall be exposed to the weather until they are ready to be inserted.

4. Each liner shall be accompanied by suitable documentation indicating:

    a. Time and date of manufacture,

    b. Fiberglass thickness,

    c. Length of liner,

    d. Resin types,

    e. Resin content,

    f. Catalyst,

    g. Relevant batch numbers,

    h. etc.

5. Liner protection – Prior to inserting the Liner, a plastic slip/rub sheet 10 mil thick will be pulled and laid flat into the host pipe such that it protects the Liner from damage as the Liner is pulled in.

6. Liner Insertion –

    a. Insert the liner through an existing manhole or approved access point

    b. Fully extend to the next designated manhole or termination point.

    c. Pulling speed shall not exceed 15 ft/min.

    d. Exercise care that no axial stretching occurs so that there is no damage to the tube during the pulling phase.

7. The tube shall be positioned in the pipeline using the method specified by the manufacturer.

    a. Exercise care not to damage the tube as a result of installation.

8. Liner Inflation –

    a. Pressurize the tube to achieve and maintain a tight fit (no gap) against the host pipe throughout the curing process.

        1) End plugs or packers shall be used to cap each end

of the liner to prepare for pressurizing.

2) The end caps shall be secured with straps or by other means to prevent them from being expelled.

b. The curing light train and CCTV camera shall be installed and directed through the entire length of the tube during which a detailed CCTV inspection is performed of the uncured tube.

c. Any defects, such as water bubbles, shall be addressed before the curing begins.

d. The light train is the activated and moved back along the length of the tube to affect the curing of the tube into a UV-CIPP.

9. The liner ends shall be the full size of the host pipe and shall be tight fitting to the end of the host pipe.

a. No wrinkles are acceptable at the termination of the liner.

b. No leaking from the liner/host pipe interface will be accepted.

10. The light cure train shall be fitted with suitable monitors to gauge the cure achieved throughout the length of the liner.

a. The speed of cure shall be as per the manufacturer's requirements.

11. The inner tube protective membrane shall be removed after the liner has been cured.

12. Complete installation process control sheets for every lining completed. Control sheet shall provide the following information:

a. Date and time

b. Liner length

c. Pressure required to inflate tube and hold tight until curing process complete

d. Time curing process started

e. Curing time

f. Time curing process ended

g. Light source and wattage

h. Exothermic (curing) Temperatures

i. Time cutting ends started

j. Time cutting laterals started

k. Number of laterals cut

E. Curing

1. The Contractor shall be responsible for the thorough curing of the liner to achieve the specified results.

a. The curing process shall be performed in accordance with the manufacturer's recommendations.

2. Contractor shall extend, at their expense, curing time to achieve a hard, sound liner demonstrating the specified mechanical and chemical properties, if required.

3. Service Lateral Re-Instatement:

a. After liner has been cured in place:

1) Use CCTV and a robotic cutter device to field locate existing service connections,

2) Confirm the number of service connections to be reinstated and complete work to bring them back on line.

a) Recover coupons at downstream manhole and remove.

b) All service lateral reinstatements will be wire brushed to eliminate burrs and snags.

3) Service interruptions shall not exceed 8 hours.

4) Existing sewer service laterals will be internally reinstated to 100% of their pre-CIPP flow diameter.

a) The finished opening shall be smooth with no ragged edges and shall prevent clogging or blockages.

.

b. Do not reconnect services from abandoned or vacant lots, unless otherwise directed by the Program Manager.

c. Show distance from nearest downstream manhole to reconnected service on record drawings.

d. When a remote cutting device is used and a cleanout is available, then a mini-camera down the service may also be used to assist the operator in cutting or trimming.

3.04 POST INSTALLATION

A. UV-CIPP installation shall be free from visual defects such as foreign inclusions, dry spots, keel, boat hull, pinholes, wrinkles, and other deformities.

1. Defects and deformities may, at discretion of the Program Manager, be cause for rejection of entire liner.

2. Contractor shall correct failed UV-CIPP and defective UV-CIPP,

a. identified from post installation television inspection,

b. test reports for structural values

c. thickness

3. Method of repair, which may require field or workshop demonstration, shall be approved by the Program Manager prior to commencement of work.

4. Remove and replace pipe identified with defects or deformities that cannot be repaired to the satisfaction of the Program Manager and/or the Manufacturer.

B. Both ends of the cured Liner shall be cut smoothly 2” from the inlet and outlet points in the manhole

1. Seal with an epoxy or resin mixture compatible with the Liner/resin system, providing a watertight seal.

2. Sealing material and installation method shall be submitted and approved by the Owner’s Representative prior to start of construction.

a. Tube manufacturer shall also be consulted for appropriate sealing material and installation method.

3. Hydraulic cements and quick-set cement products are not acceptable.

C. Where liners of any type are installed in two or more continuous manhole segments, the liner invert through the intermediate manholes shall be left intact.

1. Final finishing of the installation in those intermediate manholes shall require removal of the top of the exposed liner

2. Neat trimming of the liner edge where it touches the lip of the manhole bench.

3. Sealing between the new liner and pre-existing manhole channel.

D. Portions of any piece of liner material removed during installation shall be available for inspection and retention by the Owner’s Representative.

E. All manhole drop connections will be reviewed on an individual basis.

1. Reinstate openings for all drop assemblies after relining mainline sewer.

2. Everywhere possible, outside drop assemblies shall be lined with a cured-in- place liner compatible with the mainline liner, for the full length of the drop assembly and bend.

3. Drop assemblies inside of manholes are not required to be relined, unless directed by the Owner’s Representative.

F. Each line segment lined shall be CCTV inspected as soon as practical after processing to assure complete curing.

1. Segments not fully conforming to these Specifications must be immediately brought to the Owner's Representative attention with a proposed method of correction without cost to the Owner.

3.05 SAMPLE TESTING

A. The Contractor shall have an independent testing lab analyze finished liner samples taken from manhole cutoffs, service coupons, etc.

1. A minimum of one (1) 12-inch long restrained sample shall be taken from each liner segment installed, or as directed by the Owner's Representative.

2. Physical samples removed for testing shall be individually labeled and logged to record the following:

   a. Owner's Project number and title

   b. Sample number

   c. Segment number of line as noted on plans

   d. Date and time of sample

   e. Name of Contractor

   f. Location and by whom tested

   g. Results of test

   h. Street name and address

3. Send one (1) sample from each liner segment installed to test in accordance with ASTM standards for:

   a. Flexural Modulus,

   b. Flexural Strength

   c. Wall thickness shall be conducted, a minimum of three samples per project will be tested.

   d. If tests do not meet the minimum values:

      1) Additional samples originally not sent for testing may be required to be tested, as directed by the Program Manager.

      2) Contractor bears all costs associated with additional testing.

Property	ASTM Test Method	Minimum Value
Flexural Strength	D790	20,000 psi
Flexural Modulus	D790	1,000,000 psi

Thickness	D2122 (per F2019)	Contract requirement

B. Resin Sampling:

1. Wet-out facility resin mixing equipment shall have a valve downstream of the mixing function and immediately upstream of application of mixed resin of tube where resin samples may be drawn.
2. Batch mix facilities, if any, shall provide sampling of mixed batch.
3. Submitted “wet-out” schedule cannot be modified without 24-hour notice to Owner’s Representative.
4. Resin samples shall be drawn at times determined by Owner’s Representative.

C. Field thickness testing:

1. Perform prior to conducting laboratory tests.
2. Take a wall thickness measurement in accordance with ASTM D2122
3. Make a minimum of four measurements, evenly spaced, on each test specimen.
    a. Calculate average thickness using measured values.
4. Average thickness shall be equal or greater than required design thickness.
5. Failure of thickness test shall be grounds for rejection for CIPP liner

D. If properties tests do not meet the minimum physical and thickness requirements, the CIPP shall be repaired or replaced at the Contractor’s expense.

E. All curing, cutting, and identification of samples will be witnessed by the Owner’s Representative.

3.06 TELEVISION INSPECTION

A. Perform television survey in accordance with the requirements of Section 01510 – Sanitary Sewer Main Television and Sonar Inspection (CCTV).

1. CCTV shall be performed:
    a. Prior to installation of the UV-CIPP but after cleaning.
    b. After installation of CIPP line and the reconnection of all active sewer laterals.

B. Conduct finished inspections continuous over entire length of sewer

between manholes within 48 hours of installation.

1. Liner shall be free from visual defects, damage, and deflection.
    a. No visible infiltration through the liner, at the joints, at the service connections or at the manholes
2. Base acceptance of liner on videotaped CCTV inspection and that defects described in 1, above, do not exist.
    a. Corrections of defects or failures identified in post-installation CCTV shall be repaired at no cost to Owner
    b. Method of repair shall be approved by Owner's Representative prior to completion of work.

3.07 TESTING

A. Test full Length CIPP testing shall be in accordance with Section 02650 – Testing for Acceptance of Sanitary Sewers.

3.08 ACCEPTANCE

A. Laboratory Testing: one sample shall be sent to an independent laboratory and tested.

1. Preparation and testing standards shall be performed in accordance with the approved submittals.
2. Failure of any test can be grounds for rejection of the CIPP liner.
3. At the direction of the Program Manager a second sample shall be tested.

B. Destructive Testing: Where test results of samples from the 12-inch long pipe section are lower than required values, at the direction of the Program Manager, Contractor shall cut samples form liner along length of pipe.

1. The size and shape of the samples shall be determined by Program Manager.
2. The Contractor shall repair the CIPP liner and host pipe at no additional cost to the Owner.
3. Failure of test shall be grounds for rejection for the CIPP liner.

C. Resin Sampling: Program Manager drawing the samples will arrive unannounced and shall be afforded immediate access to the equipment.

1. Resin sample shall be sent to the independent laboratory and tested.
2. Testing standards shall be performed in accordance with approved submittals.

3. Failure of any test can be grounds for rejection for the CIPP liner.

D. Low-pressure air testing or hydrostatic exfiltration test: acceptance based on successful completion of this test as specified herein.

E. The Contractor shall submit to the Owner's Representative, for acceptance and approval,

1. Two (2) copies of unedited post-installation CD/DVDs
2. Associated certified test reports for each sewer main segment within 10 working days of the Liner installation.
3. No more than one sewer main segment shall be included on a post- installation Inspection CD/DVD or curing report.

F. It is the intent of these specifications the completed liner, with all appurtenances, to be essentially equivalent in final quality and appearance to new sewer pipe installation.

1. The conditions of the existing host pipe will be taken into consideration.

G. Where, in the opinion of the Program Manager, a defect in the CIPP liner requires removing a section of the CIPP liner, the Contractor shall make all repairs as directed by the Program Manager and shall install a segmental liner, compatible with the CIPP liner, to accomplish a continuous finished liner.

1. No separate measurement and payment will be made for such defect repair or for the post-repair segmental liner.

3.09 PRIVATE SERVICE LINE SHUTDOWN

A. Notify Owner's Representative at least 1 week prior to shut down.

B. When it is necessary to shut down a private sewer service line notify building occupants regarding service lateral disconnection by placing a door hanger approved by the Owner's Representative.

1. Place door hangers 48 hours prior to shut down.

C. When service lateral will be disconnected from main for more than 8 hours, lateral shall be positively drained or pump down.

1. Monitor status of flow and storage.
2. Pump lateral more frequently where flows exceed storage capacity of lateral or Contractor provided temporary storage.

D. If service lateral cannot be positively drained or pumped down or disconnection of service is anticipated being 8 hours or longer,

1. Contractor shall provide temporary living accommodations for

resident at no additional cost to Owner or resident.

2. Temporary living quarters accommodations shall be approved by Program Manager and coordinated through resident and Owner's Customer Support Representative.

3. Alternatively, Contractor may supply a temporary bypass pumping system to keep the lateral operational.

E. Notify building occupants when work is complete and uninterrupted service restored.

F. Commercial sewer services shall be maintained at all times while the business is open.

1. No sewage from the services or main line shall be discharged on the ground or in waterways.

2. Holding pits or tanks are not allowed unless permitted by Federal, State, and local authorities having jurisdiction.

3.010 CLEANUP

A. After the CIPP liner installation work has been completed and all testing acceptable, the Contractor shall clean up the work area.

1. All excess material and debris not incorporated into the permanent installation shall be disposed of by the Contractor.

a. The debris and liquids are to be disposed of properly in accordance with all applicable laws.

b. The local municipality can furnish a letter to the landfill stating the Contractor is authorized to dispose of the non-hazardous materials.

c. Debris and liquids type and quantities are to be tracked in the daily Contractor diary.

d. Hauling and disposal costs will be borne by the Contractor.

2. The work area shall be left in a condition equal to or better than prior condition.

a. Disturbed grassed areas shall be seeded or sod placed as directed by the Owner's Representative at no additional cost to the Owner.

b. The work site restoration work shall be completed in accordance with the requirements of Section 02480 – Site Restoration and Erosion Control.

c.

3.011 DOCUMENTATION

A. The Contractor shall complete work on each asset as assigned via the Owner's Computerized Work Order Management system.

1. Upon start of work, the Contractor shall receive work orders as assigned by the Owner's Representative.
2. The Contractor shall maintain and synchronize the status of each rehabilitation work order issued.

3.012 WARRANTY

A. Material Warranty: A written guarantee of 3 years shall be provided by manufacturer against breakdown of material effectiveness of structural repair elements.

B. Workmanship Warranty: The Contractor shall guarantee his work for a warranty period of three (3) years from the date of final acceptance against any leakage, cracking, loss of bond, or other discontinuity as identified.

1. Contractor and liner manufacturer representative shall participate in inspection.
2. Deficiencies related to material and workmanship shall be repaired by contractor to the satisfaction of the Program Manager at no additional cost.
3. If repairs are made, then the Contractor shall warrant the work for one (1) year in addition to the original warranty period required by the Contract.

END OF SECTION

SECTION 02520

INTERNAL POINT REPAIRS TO SANITARY SEWERS

PART 1 — GENERAL

1.01 SECTION INCLUDES

A. The work covered under this section includes furnishing all labor, equipment, and materials required to furnish, install, test, and inspect internal point repairs of sanitary sewers with cured-in-place pipe (CIPP) liner as shown on the Plans and specified in this section.

1.02 RELATED SECTIONS

A. Section 01510 - Sanitary Sewer Main and Lateral Television Sonar Inspection

B. Section 01520 - Sewer Flow Control

C. Section 02276 – Site Restoration and Erosion Control

D. Section 02500 - Lining with Cured-In-Place Pipe (CIPP)

E. Section 02956 - Sanitary Sewer Cleaning

1.03 REFERENCES

A. ASTM D638 - Standard Test Method for Tensile Properties of Plastics.

B. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

C. ASTM D2990 - Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics.

D. ASTM D5813 - Standard Specification for Cured-In-Place Thermosetting Resin Sewer Piping Systems.

E. ASTM F1216 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.

F. ASTM F1743 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe.

G. ASTM F2019 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe.

H. Potable Water Main, Gravity Sewer, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards, DeKalb County Department of Watershed Management.

1.04 QUALIFICATION REQUIREMENTS

A. Point repair subcontractor will be submitted for approval by DWM through the RFI process..

1.05 SUBMITTALS

A. The Contractor shall submit a comprehensive construction sequencing plan for approval prior to the beginning of the project. At minimum the plan shall include the following:

1. A proposed schedule.

2. Identification of all proposed access routes.

3. Identification of set-up locations for CIPP point repair installation.

4. Bypass pumping plan in accordance with the requirements of the Section 01520 Sewer Flow Control.

5. Traffic Control Plan in accordance with Georgia Department of Transportation (GDOT) requirements (where applicable).

6. Erosion Control Plan in accordance with the DeKalb County Department of Watershed Management Protocol for Providing Erosion & Sedimentation Controls on Construction Projects.

B. The Contractor shall submit the following items for product and installer pre- approval:

1. Manufacturer's certificate the materials to be used meet the referenced standards and the requirements of these Specifications.

2. License or certificate verifying manufacturer's/licensor's approval of the installer.

3. Proposed equipment and procedures for accomplishing the work.

4. Product data and manufacturer's installation for resin and catalyst system.

C. The Contractor shall submit the following information during the project for approval of the use of CIPP point repair at a particular location:

1. Calculations for the wall thickness designs including data, field measurements, and assumptions. To be completed by a Georgia registered professional engineer proficient in the design of CIPP systems.

2. The Contractor's procedures and materials for service renewal including time and duration of sewer service unavailability, if point repair area contains service connections.

D. A final certificate of compliance with this specification shall be provided by the manufacturer for all lining material furnished. Tests for compliance by an independent laboratory shall be performed in accordance with applicable ASTM standards and the manufacturer's quality control program.

E. The Contractor shall furnish an extended warranty for liner materials from the Contractor and the liner manufacturer for a total of one (1) year from the date of Final Acceptance.

F. The Contractor shall complete a daily written record (diary) detailing the work performed and any small items incidental to the Work in the form of an email. The Contractor shall include the following information in his daily record:

1. Delays and causes of delays: Dense traffic, lack of information, sickness, labor, or equipment shortage, etc.

2. Weather conditions: Rain, sunny, windy, temperature, snow, etc.

3. Types of equipment on site: Specialty cleaning, by-pass equipment, etc.

4. Submittals: To the Owner's Engineer (Project Manager).

5. Personnel on site: Name, labor category, specialty personnel, etc.

6. Accidents/injuries: Injuries, vehicle/equipment accidents, etc.

7. Incidents: Vehicle and equipment damage, damage to property, property owner complaint, etc.

8. Major defects encountered: Collapsed pipe, cave-ins, sink holes, etc.

9. Visitors: Names and affiliations.

10. Disposals: Type and quantity of debris (including liquids).

G. The Owner's Representative shall certify receipt of the daily record (in email format) noting any items and adding any observations with reference to claims for payment to the Contractor. The Owner's Representative may, at his/her discretion, for which the Contractor must receive direction in writing, provide weekly submission in the form of progress report.

H. As-built drawings including the identification of the work completed by the Contractor and the post-installation CCTV shall be submitted within 2 weeks after the project is completed.

1.06 SECTION NOT USED

1.07 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall be responsible for the delivery, storage, and handling of products. No product shall be shipped to the Site of the Work without the approval of the Owner's Representative.

B. The Contractor shall keep products safe from damage. The Contractor shall promptly remove damaged products from the Work Site and replace damaged products with undamaged products acceptable to the Owner's Representative.

C. Comply with the requirements of the CIPP point repair manufacturer.

1.08 RESPONSIBILITY FOR SANITARY SEWER OVERFLOWS AND DAMAGE TO PROPERTY AND UTILITY

A. Reference Specification Section 01030 – Special Project Procedures, Paragraph B.

1.09 SAFETY

A. All work shall be performed in accordance with OSHA standards and State and Federal safety regulations.

B. No person shall enter a confined space without the documented requisite training, certification, and entry permit.

PART 2 – PRODUCTS

2.01 GENERAL

A. All materials shall be in strict compliance with the requirements of ASTM, ANSI, and/or AWWA and the requirements of these Specifications.

B. The finished pipe liner in-place shall be fabricated from materials when completed is chemically resistant to and will withstand internal exposure to domestic wastewater.

C. Field measurements of the existing pipe diameters, ovality, and length shall be taken by the Contractor to verify actual pipe dimensions.

2.02 CURED-IN-PLACE LINER

A. All cured-in-place lining products shall comply with the most recent versions of ASTM F-1216, ASTM F-1743 or intent thereof as determined by the Owner's Representative.

B. The flexible tube shall be fabricated to a size when installed will neatly fit (minimum 99.75%) the internal circumference of the existing sanitary sewer lines (including services). Allowance shall be made for circumferential stretching during insertion so the final cured product is snug against the wall of the host pipe.

C. The minimum length shall be, as deemed necessary by the Contractor, to effectively span the distance from the adjacent pipe joints plus 1.0 feet each side unless otherwise shown on the Plans or directed by the Owner's Representative. The Contractor shall verify the lengths in the field before impregnation.

D. Unless otherwise shown on the Plans or directed by the Owner's Representative, the Contractor shall furnish a general purpose, unsaturated, polyester or vinyl ester resin and catalyst system compatible with the reconstruction inversion process providing cured physical strengths specified in this section.

E. Physical Strength:

1. The cured pipe shall conform to the following minimum structural standards:

Test Method		Results
Flexural Stress	ASTM D790	4,500 psi Flexural
Modulus of Elasticity	ASTM D790	250,000 psi Tensile
Strength	ASTM D638	3,000 psi

2. The liner thickness shall be sized for a minimum hydrostatic load of eight (8) feet and the maximum depth of earth cover as shown on the Plans. The hydrostatic load shall be increased to manhole depth plus one (1) foot for bury depths in excess of eight (8) feet.

A. Corrosion Requirements: The cured pipe shall be chemically resistant to internal exposure of sewage having a pH range of 5 to 11 and a peak temperature of 180°F.

PART 3 – EXECUTION

3.01 PREPARATION

A. The following installation procedures shall be adhered to unless otherwise approved by the Owner's Representative.

1. The Contractor shall carry out his operations in strict accordance with all OSHA and manufacturer's safety requirements. Particular attention is drawn to those safety requirements involving entering confined spaces.

2. It shall be the responsibility of the Contractor to remove all internal debris and clean the existing sewer line prior to installation of the liner. Cleaning and disposal of material shall be performed in conformance with the requirements of the Sanitary Sewer Cleaning section of these Specifications. The debris is to be disposed of properly in accordance with all applicable laws. The Owner's Representative can furnish a letter to the landfill stating the Contractor is authorized to dispose of non-hazardous materials. Debris and liquids quantities are to be tracked in the daily contractor diary.

3. Experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit television shall perform inspection of existing sewer lines. The interior of the line shall be carefully inspected to determine the location of any conditions preventing proper installation of the CIPP point repair into the lines, and such conditions shall be noted so they can be corrected. A video recording and suitable log shall be kept for later reference by the Owner's Representative as specified in Section 01510, Sanitary Sewer Main Television and Sonar Inspection (CCTV).

4. The Contractor shall provide for the flow of wastewater around the section or sections of pipe designated for internal point repairs as specified in Section 01520, Sewer Flow Control.

5. The Contractor shall clear the line of obstructions such as solids, dropped joints, protruding service connections or collapsed pipe preventing the insertion of the materials or equipment. If inspection reveals an obstruction cannot be removed by conventional sewer cleaning equipment or robotic equipment, then the Contractor may be ordered to make a point repair excavation to uncover and remove or repair the obstruction.

6. Groundwater temperatures and ambient temperatures shall not be excessive for the product installation procedures.

3.02 INSTALLATION

A. Cured-in-Place Liner:

1. The Contractor shall designate a location where the reconstruction tube will be impregnated prior to installation. The Contractor shall allow the Owner's Representative to inspect the materials and "wet out" procedure. A catalyst system compatible with the resin and reconstruction tube shall be used. Sufficient excess resin will be provided to insure a mechanical bond with the host pipe after curing.

2. The wet out reconstruction tube shall be inserted through an existing manhole or other approved access and moved through the pipe to the termination point. The insertion bladder will then be inflated to hold the CIPP point repair snugly against the existing pipe in the correction location. Care shall be taken during the elevated curing temperature so as not to overstress the felt fiber. Alternative methods of liner insertion and pressurization may be used for products and processes approved by the Georgia Department of Natural Resources and the Owner's Representative, and when the final cured-in-place product meets the intent of ASTM F1216. Installation shall be in accordance with the manufacturer's recommendations and available for verification by the inspector.

3. The CIPP point repair shall be an ambient cure system and the cure period shall be of a duration recommended by the resin manufacturer.

4. The finished pipe shall be continuous over the length of the internal point repair, overlap point repairs if necessary, and be as free as commercially practicable from visual defects such as foreign inclusions, wrinkles, dry spots, pinholes, and delamination. It shall also meet the leakage test requirements.

5. Alternate curing mediums may be used, including, but not limited to steam and ambient cure. When alternate curing mediums are used, the end product must meet or exceed the requirements of this section. Alternate curing mediums and alternate installation methodologies must be submitted for approval to the Owner's Representative prior to the bid opening date as specified in the bid documents. Notification of approval (or rejection) shall be made prior to bid opening.

6. When alternate curing mediums and/or alternate installation methodologies are approved for use, the Contractor shall follow all of the manufacturer's recommendations for installation and curing, no exceptions shall be permitted.

3.03 POST INSTALLATION

A. Portions of any piece of liner material removed during installation shall be available for inspection and retention by the Owner's Representative.

B. Each internal point repair shall be CCTV inspected as soon as practical after internal repair. The Contractor shall provide a copy of the video to the Owner's Engineer on an External Hard Drive media.

3.04 MANUFACTURER CERTIFICATION

A. The manufacturer shall certify the Contractor is properly trained in the method or system being used.

B. The manufacturer should be on site for 2 to 5 eight-hour days or more depending on project size to confirm the Contractor is doing the installation correctly.

3.05 TESTING

A. After installation every liner shall be CCTV inspected with a 360-degree integral light-head camera as soon as practical to verify proper installation.

B. At the existing pipe/internal point repair interface, no visible leaks shall be allowed.

3.06 EXISTING UTILITIES

A. The Contractor shall protect all known and unknown existing sewer lines, water lines, gas lines, sidewalks, curbs, gutters, pavements, electric lines, and other utilities and structures in the vicinity of the work from damage at all times. Where it is necessary for the proper execution of the work to repair, remove, and/or replace any such utility or structure, the Contractor shall do so in accordance with the provisions set forth in the General and Special Conditions of the Contract. Any such work to be done at the Contractor's expense shall be considered incidental to the construction of sewers, and no additional payment will be allowed therefore.

3.07 COLLAPSED SEWERS/DEFECTIVE MANHOLES

A. Any sewer found with greater than ten (10) percent deformation (i.e. collapsed or near collapse) shall be reported to the Owner's Representative immediately for remedial action.

B. Any manhole found broken, cracked, with missing covers, or surcharged, shall be reported to the Owner's Representative immediately for remedial action.

C. Any sewer found where the existing conditions pose a threat of personal injury to the public, such as a collapsed sewer with attendant depression to roadway, shall be protected by the Contractor until the Owner's Representative arrives at the Work Site.

D. Any manhole found where the existing conditions pose a threat of personal injury to the public, such as broken, cracked, or missing covers, or covers found in traveled portions of any sidewalk or roadway shall be protected by the Contractor until the Owner's Representative arrives at the Work Site.

3.08 PRIVATE SERVICE LINE SHUTDOWN

A. When it is necessary to shut down a private sewer service line while work is in progress and before the service lines are reconnected, the residents shall be notified by the Contractor at least forty-eight (48) hours prior to the shutdown. No sewer or water service is to remain shut down for more than a period of eight (8) hours unless the Contractor provides substitute services/accommodations to the residents. Commercial sewer services shall be maintained at all times the business is open. No wastewater from the services or main line shall be discharged on the ground or in waterways. Holding pits or tanks are not allowed unless permitted by the State and the County.

3.09 CLEANUP

A. After the CIPP liner installation work has been completed and all testing acceptable, the Contractor shall clean up the work area. All excess material and debris not incorporated into the permanent installation shall be disposed of by the Contractor. The debris and liquids are to be disposed of properly in accordance with all applicable laws. The Owner can furnish a letter to the landfill stating the Contractor is authorized to dispose of the non-hazardous materials. Debris and liquids type and quantities are to be tracked in the daily Contractor diary. Hauling and disposal costs will be borne by the Contractor. The work area shall be left in a condition equal to or better than prior condition. Disturbed grassed areas shall be seeded or sod placed as directed by the Owner's Representative at no additional cost to the Owner. The work site restoration work shall be completed in accordance with the requirements of Section 02480 – Site Restoration and Erosion Control.

3.10 WARRANTY

A. The Contractor shall guarantee his work for a warranty period of three (3) years from the date of final acceptance. If, at any time during the warranty period, any leakage, cracking, loss of bond, or other discontinuity/abnormalities is identified the Contractor shall make repairs acceptable and at no additional cost to the Owner. In this case, the Contractor shall warrant the work for one (1) year in addition to the warranty required by the Contract.

B. If the frequency of similar defects requiring repair increases, then the entire project will be re-evaluated.

END OF SECTION

SECTION 02530

SERVICE LATERAL RECONNECTION AND REPLACEMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Work this section includes the reconnection of existing service laterals to the sewer main and the replacement of sewer laterals.

1.02 RELATED SECTIONS

A. Section 01510: Sanitary Sewer Main and Lateral Television Sonar Inspection

B. Section 01520: Sewer Flow Control

C. Section 02324: Trenching and Trench Backfilling

D. Section 02535: Gravity Flow Sanitary Sewers

E. Section 02537: Ductile Iron Sanitary Sewer Pipe and Fittings

F. Section 02622: PVC Gravity Sewer Pipe

1.03 SECTION 02600 – WASTEWATER FLOW CONTROL REFERENCES

A. ASTM A746 - 09 Standard Specification for Ductile Iron Gravity Sewer Pipe.

B. ASTM D1784 - 11 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

C. ASTM D3034 - 08 Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

D. ASTM D3212 - 07(2013) Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

E. Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards, DeKalb County Department of Watershed Management, Latest Edition and Version.

1.04 SUBMITTALS

A. The Contractor shall complete a daily written record (diary) detailing the work carried out and any small items of Work which were incidental to the Work. The Contractor shall include in his daily record and reference to the following:

1. Delays: Dense traffic, lack of information, sickness, labor or equipment shortage, etc.

2. Weather: Conditions (e.g., rain, sunny, windy, etc.).

3. Equipment: On site (e.g., specialty cleaning, by-pass equipment, etc.).

4. Submittals: To the Owner's Engineer.

5. Personnel: On site by name (e.g., all labor, specialty services, etc.).

6. Accident: Report (e.g., all injuries, vehicles, etc.).

7. Incident: Report (e.g., damage to property, property owner complaint, etc.).

8. Major defects encountered: including collapsed pipe, if any, cave-ins, sink holes, etc.

9. Visitors: On site.

10. Disposals: Type and quantity of debris (including liquids).

1.05 EXPERIENCE

A. All sub-contractors will require DWM approval prior to beginning associated work.

B. Prior to beginning work, Contractor shall submit certification or documentation of the following:

1. The supervisor of the field crews shall have received proper training and have a minimum of three (3) years' experience in performing the type of work covered under this section of these Specifications including safe working practices, confined space entry procedures, the types of equipment being used, product/materials being used, etc.
2. Field crew leaders shall have received proper training in this function and have a minimum of two (2) years' experience in performing the type of work covered under this section of these Specifications including safe working practices, confined space entry procedures, the types of equipment being used, product/materials being used, etc.
3. OSHA Confined Space and Trench, Excavation Safety training for all crewmembers.

1.06 RESPONSIBILITY FOR SANITARY SEWER OVERFLOWS AND DAMAGE TO PROPERTY AND UTILITY

A. Reference Specification Section 01030 – Special Project Procedures

1.07 SAFETY

A. All work shall be performed in accordance with OSHA standards and state and federal safety regulations.

B. No person shall enter a confined space without the documented requisite training, certification, and entry permit.

PART 2 - PRODUCTS

2.01 PIPE AND FITTINGS

A. All materials shall be pre-approved by the Owner.

B. The Contractor shall use PVC (minimum SDR 35) pipe, or class 50 ductile iron pipe for 6-inch service lateral connections. All laterals segments within the roadway shall be replaced with ductile iron pipe. Transition from DIP to PVC with approved fittings beyond the edge of pavement is allowed.

C. PVC pipe shall be gasket jointed conforming to the requirements of ASTM D-32l2.

D. For reconnection of existing services, the Contractor shall select service connection pipe diameter to match existing service diameter.

E. The Contractor shall connect service laterals to the sewer mains with prefabricated sewer wye conforming to the specifications for the sewer main pipe material as specified in other sections of these Specifications, or other as approved by Owner's Engineer. The use of tees is prohibited without permission from the Owner's Engineer.

2.02 PIPE SADDLES

A. The Contractor shall use pipe saddles only on rehabilitated sanitary sewer mains.

B. The Contractor shall supply Romac Industries, Inc. Style "CB" sewer saddle, branch type universal or Owner approved equal. The Contractor shall use a saddle fabricated to fit the outside diameter of the pipe to which it will be attached.

2.03 COUPLINGS AND ADAPTER

A. For connection between new PVC pipe or DIP service lateral and an existing service, the Contractor shall use a PVC C-900 rubber-gasket transition adapter when going from Ductile Iron or C-900 to Schedule 40 pipe.

2.04 CLEANOUTS

A. PVC, SDR 35 pipe and fitting shall be utilized for the installation of six- (6) inch cleanouts.

B. Rubber couplings as manufactured by Fernco, Inc. or Owner approved equal shall be utilized for pipe connection to the existing pipe.

C. Rubber doughnut gasket adapters shall be manufactured by Fernco, Inc. or Owner approved equal.

D. Non-traffic grade cleanout boxes shall comply with the Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards, DeKalb County Department of Watershed Management, Latest Edition and Version.

E. Traffic grade cleanout boxes shall comply with the Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards, DeKalb County Department of Watershed Management

2.05 WATERTIGHT FULL WRAP SEAL

The Watertight Full Wrap Seal is a one-piece liner with a sewn connection that covers in a full wrap/360° inside the mainline pipe. There is a smooth tapered transition to the host pipe continuing up the service lateral that creates a watertight fitting at the interface connection. The use of Hydrophilic Sealants (hydrophilic gasket and flowable hydrophilic paste at the main to lateral connection and a hydrophilic gasket at the terminating end of the CIPP lateral) and Silicate Resins applied to the backside of the full wrap/360° connection insures a watertight seal. The finished lateral product meets or exceeds ASTM F1216 for Cured-In-Place Pipe. Installation is done with the use of ambient cure polyester or vinylester resins and installations can be performed during active infiltration.

PART 3 - EXECUTION

3.01 PROTECTION

A. The Contractor shall not allow sand, debris, or runoff to enter the sewer system.The Contractor shall ensure that wastewater does not backup into private property. The Contractor shall establish a plan to prevent sewer backups when reconnections are not accomplished in a timely manner.

B. The Contractor shall provide for diversion of wastewater if necessary, in accordance with the requirements of Section 01520 – Sewer Flow Control. The Owner may direct the Contractor to use cleanouts to bypass wastewater from adjacent facilities if the possibility of wastewater backup is likely.

C. The Contractor shall be responsible for any and all damage to property due to his work.

3.02 PREPARATION

A. The Contractor shall provide a minimum of forty-eight- (48) hour written notice to property owners whose sanitary sewer service will potentially be interrupted.

B. The Contractor shall properly disconnect existing connections from the sewer and reconnect to the main line, as described in this section.

C. The Contractor shall reconnect service connections, including those that go to unoccupied or abandoned buildings, unless directed otherwise by the Owner's

Engineer.

D. The Contractor shall complete reconnection of all service lines within twenty-four-(24) hours.

3.03 RECONNECTION ON REPLACEMENT SEGMENTS

A. The Contractor shall install a new service wye on the new sanitary sewer main for each service connection. The service wye shall be of a material compatible with the sewer main material.

B. The Contractor shall remove and replace cracked, offset, or leaking service line from the center of the new sewer main up to the first fitting or five (5) feet, whichever occurs first.

C. The Contractor shall make up the connection between new sewer main and existing service lateral using PVC C-900 or ductile iron sewer pipe and approved fittings and couplings.

3.04 UTILITY SERVICE REPAIRS

A. Where service connections or lines from water or gas mains or sewers to the user's premises are disconnected, broken, damaged, or otherwise rendered inoperative by the Contractor for any reason, the Contractor shall, at his own expense, arrange with the respective utility company for any repairs of lines under their jurisdiction. For lines not within their jurisdiction, the Contractor shall repair or replace same and restore service to the premises.

3.05 SPECIAL CONSIDERATIONS

A. The Contractor shall notify the Owner's Engineer of any service stub that is collapsed, has severe root intrusions, or is otherwise in poor condition. The Owner's Engineer will make a determination on a case-by-case basis whether to proceed with the cleanout installation or replace the entire service stub. All replacement service stubs will be six- (6) inch and shall be installed in accordance with the Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards, DeKalb County Department of Watershed Management.

B. The Contractor shall notify the Owner of conflicts with other utilities, which prevent the installation of a cleanout as specified herein and make recommendations to resolve such conflicts.

C. Every effort shall be made to complete the installation and backfill excavations each day. In situations where the installation cannot be completed, the site may only be left open overnight with proper safety barriers and warning signs alerting the public to the hazard. The Contractor shall be responsible for providing and installing all barriers, barricades, fence, warning tape, and other items necessary to safely secure the work site.

D. Without written permission from the property owner, the spoil pile may only be

placed within the easement area, right-of-way or Owner roadway and is not to be placed on private property. Where pedestrian or vehicular traffic is obstructed, the Contractor shall provide adequate safety measures to protect against accident or injury.

E. Vehicles and construction equipment shall not be parked and left on private property.

F. The Contractor shall repair damages to sprinkler systems including those that are installed within the Owner right-of-way and/or sanitary sewer easement. It is recommended that the Contractor confer with each property owner concerning the possibility of sprinklers and the locations thereof during the notification process.

3.06 TESTING

A. The completed cleanout installation shall be televised, both externally and internally with a color CCTV camera. The same camera shall capture and record a picture of the house or street address of the installation. Without pause in recording, the Contractor shall pan over the restoration of property, the cleanout box, and insert the camera into the cleanout installation. The Contractor shall pass the camera through the cleanout, into the wye and through that portion of the six- (6) inch pipe installed. Any defects found during inspection shall be noted and corrected at no additional expense to the Owner. The Contractor shall make appropriate repairs until the cleanout installation passes the video inspection.

B. When directed by the Owner's Engineer, the Contractor shall perform smoke testing, dye testing, or low pressure hydraulic testing to confirm reconnection.

C. All inspections shall be submitted following the standards and formats as outlined in Section 01510 – Sanitary Sewer Main and Lateral Television Sonar Inspection.

3.07 CLEANUP

A. After installation work has been completed and all testing acceptable, the Contractor shall clean up the work area. All excess material and debris not incorporated into the permanent installation shall be disposed of by the Contractor. The debris and liquids are to be disposed of properly in accordance with all applicable laws. The local municipality can furnish a letter to the landfill stating that the contractor is authorized to dispose of the non-hazardous materials. Debris and liquids type and quantities are to be tracked in the daily contractor diary. Hauling and disposal costs will be borne by the contractor. The work area shall be left in a condition equal to or better than prior condition. Disturbed grassed areas shall be seeded or sod placed as directed by the Owner's Engineer at no additional cost to the Owner. The work site restoration work shall be completed in accordance with the Section 02480 – Site Restoration and Landscaping.

3.08 WARRANTY

A. The Contractor shall guarantee his work for a warranty period of three (3) years from the date of final acceptance. If, at any time during the warranty period, any leakage, cracking, loss of bond, or other discontinuity/abnormalities is identified

the Contractor shall make repairs acceptable and at no additional cost to the Owner. In this case, the Contractor shall warrant the work for one (1) year in addition to the warranty required by the Contract.

B. If the frequency of similar defects requiring repair increases, then the entire project will be re-evaluated.

END OF SECTION

SECTION 02535

GRAVITY FLOW SANITARY SEWERS

PART 1 — GENERAL

1.01 SECTION INCLUDES

A. The work covered under this section includes furnishing all labor, equipment, and materials required to install, inspect, and test full length sections (manhole to manhole) and external point repairs on gravity flow sanitary sewers.

1. External Point repair is the method for correcting a defect on a mainline requiring excavation.

    a. This type of repair shall include:

        1) Excavation, shoring, removal and disposal of debris and spoil materials, dewatering, required surface demolition including but not limited to the cutting and removal of asphalt or concrete pavement, sub-pavement, curb and gutter, sidewalk, etc., removal and reinstallation of all obstructing surface features, complete.

        2) Replacing a section of pipe up to fifteen (15) liner feet in length as required for structural defect repair

        3) Replacing service connections as required

        4) Installing flexible repair couplings, collars or boots as applicable, and approved

        5) Connections to manholes according to DWM Standard Detail S-011

        6) Backfilling complete

        7) Disposal removed pipe and used or unused materials

        8) Site restoration

2. The pipe material shall be as directed by the Owner's Representative.

B. It is the Contractor's sole responsibility to establish elevation and/or survey controls necessary to attain true line and grade for the replacement pipe section for all External Point Repairs. No abrupt deflections in line or grade will be allowed.

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO): T99 (ASTM 698), Standard Method of Test for the Moisture-Density Relations of Soils Using a 2.5-kg (5.5-lb) Rammer and a 305-mm (12-

in.) Drop.

B. American Society for Testing Materials (ASTM)

1. A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe.

2. C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.

3. C425 – Standard Specification for compression Joints for Vitrified Clay Pipe and Fittings

4. D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft3 (600 kN-m/m3)).

5. D1557 - Standard Test Method for Laboratory, Compaction Characteristics of Soils Using Modified Proctor Effort (56,000 ft-lb/ft3 (2,700 kN-m/m3)

6. D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

7. D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

C. American Water Works Association (AWWA), Latest Revisions.

1.03 SUBMITTALS

A. Submittals shall conform to the requirements of Section 01300 - Submittals.

B. Action Submittals

1. Materials to be obtained and installed,

   a. Pipe material, diameter (inside and outside), stick length, joint make up, bedding and backfill.

2. Surface operations plan, proposed:

   a. Temporary lay down area(s) as needed

   b. Temporary installation staging area(s) as needed

      1) Points of ingress and egress.

      2) Waste storage, disposal

3. The Contractor shall submit Record Documents per Section 01720 – Record Documents.

C. Test reports.

D. Complete and submit a daily report detailing the work carried out and any small items of Work incidental to the Work. The Contractor shall include in his daily report the above and reference to the following:

1. Delays: Dense traffic, lack of information, sickness, labor or equipment shortage, etc.

2. Weather: Conditions (e.g., rain, sunny, windy, etc.).

3. Equipment: On site (e.g., specialty cleaning, by-pass equipment, etc.).

4. Submittals: To and from the Owner's Representative.

5. Personnel: On site by name (e.g., all labor, specialty services, etc.).

6. Accident: Report (e.g., all injuries, vehicles, etc.).

7. Incident: Report (e.g., damage to property, property owner complaint, etc.).

8. Major defects encountered: including collapsed pipe, if any, cave-ins, sink holes, etc.

9. Visitors: On site.

E. Disposals: Type and quantity of debris (including liquids).

F. For projects entering a Georgia Department of Transportation (GDOT) controlled Right-of-Way shall conform to the requirements outlined in Section 01060 – Regulatory Requirements

1.04 QUALITY ASSURANCE

A. Provide the Owner's Representative with the product manufacturers' written certification indicating all products furnished comply with applicable provisions of these Specifications.

1. Unless modified herein, materials used in the manufacture of pipe, linings, manholes, and castings shall be new and shall be tested in accordance with the referenced standards.

2. Perform and pay for sampling and testing as necessary for the certifications.

    a. The Owner's Representative shall have the right to witness testing of the materials.

B. Test and inspect the sewer pipe at the place of manufacture:

1. Pipe shall meet all requirements of the latest applicable ASTM standards,

    a. Certified copies of the test report covering each shipment shall be submitted to the Owner's Representative prior to laying.

2. All pipes shall be subject to inspection by the Owner's Representative at the place of manufacture.

3. Notify the Owner's Representative in writing of the manufacturing start date at least fourteen (14) days prior to the start of manufacturing.

   a. The Contractor shall be responsible for all inspection costs.

C. After delivery, pipe and fittings will be subject to inspection by and approval of the Owner's Representative.

a. No broken, cracked, misshaped, or otherwise damaged or unsatisfactory pipe, fittings, or damaged concrete lining, or coatings shall be used,

b. Remove and properly dispose of unsatisfactory materials from the job site at no cost to the Owner.

D. Check each pipe stick prior to lowering into trench:

a. Pipe interior shall be clean

b. Check for joint scratches, chipped ends, damaged linings and coatings, and imperfect gasket seats.

E. Any defective pipe or fitting discovered after the pipe is laid shall be removed and replaced with a satisfactory pipe or fitting without additional cost to the owner.

F. Each pipe shall be clearly marked as required by the applicable ASTM standard specifications to show pipe class, date of manufacture, date coated, type of coating, and manufacturer's trademark.

G. All pipe, accessories, and specials shall be new material. When directed by the Owner's Representative:

1. Pipe manufacturer shall furnish the services of a competent factory representative to supervise and/or inspect the installation of pipe.

2. Service shall be furnished for a minimum of five (5) days during initial pipe installation.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Inspect pipe materials and fittings upon arrival at the Work Site.

B. Handle and store pipe materials and fittings to protect them from damage due to impact, shock, shear, or free fall.

1. Do not drag pipe and fittings along the ground.

2. Do not roll pipe unrestrained from delivery trucks.

3. Do not insert forks inside pipe or fittings without suitable effective

protection that prohibits damage to linings or coatings.

C. Employ acceptable mechanical means to move or handle pipe.

D. Comply with the storage and handling requirements per manufacturer's recommendations.

1.06 RESPONSIBILITY FOR SANITARY SEWER OVERFLOWS AND DAMAGE TO PROPERTY AND UTILITY

Reference Specification 01030 – Special Project Procedures.

1.07 SAFETY

A. All work shall be performed in accordance with OSHA standards and State and Federal safety regulations.

B. No person shall enter a confined space without the documented requisite training, certification, entry permit and safety equipment.

PART 2 - PRODUCTS

2.01 PIPE MATERIALS

A. All materials shall be in strict compliance with the required standards and specifications including, but not limited to ASTM, ANSI, and AWWA.

B. At points of the sewer where a change in pipe classification (pressure rating, etc.) is shown on the Plans,

a. Begin new classification at the next joint of pipe rather than cutting the pipe and constructing a collar unless there is a change in horizontal or vertical alignment.

b. In the event the pipe is cut, there shall be no torch cutting, only saw cutting will be allowed.

C. Ductile Iron Pipe and fittings shall conform to the requirements of Section 02537 – Ductile Iron Sanitary Sewer Pipe and Fittings.

2.02 TRANSITION COUPLINGS

A. The same Pipe Material shall be used when installing pipe from manhole to manhole. For point repairs, approved transition joints shall be used if that matching materials are not approved for use or it is not possible to match.

1. Use of concrete collar walls for transition joints between sewer pipes of different materials shall be only used only as approved by the Owner's Representative on a case by case basis.

2. Use of transition couplings or gaskets shall require approval by the Owner's

Representative before use.

2.03 PIPE TO PIPE CONNECTIONS

A. Pipe to pipe connections shall be made using flexible banded couplings or adapters, should couplings with compression joints be required then they shall be in accordance with ASTM C425.

2.04 PIPE TO MANHOLE CONNECTIONS

A. Shall conform to the requirements of Section 02641 – Precast Concrete Manholes

2.05 APPURTENANCES

A. Service connections shall conform to requirements of this specification.

B. Manholes shall conform to the requirements of Section 02641 – Precast Concrete Manholes.

2.06 BACKFILL AND SITE RESTORATION

A. Pipe backfill materials shall conform to the requirements of Section 02324 – Trenching and Trench Backfilling.

B. Site Restoration shall conform to the requirements of Section 02276 – Site Restoration and Erosion Control.

PART 3 - EXECUTION

3.01 GENERAL

A. Identify the location of all existing underground and overhead utilities prior to commencing excavation activities.

1. The Contractor shall consult with the local Call before You Dig and utility companies, to verify the locations of existing underground utilities.

B. Immediately notify the Owner (agency or company) of any utility line, appurtenance, cathodic protection system, etc. damaged, broken, or disturbed during installation.

1. Obtain approval from the:

   a. Owner's Representative and the utility owner prior to performing any temporary or permanent repairs or relocating utilities.

C. Install and operate a dewatering system in accordance with the requirements of Section 02205 – Dewatering (when required).

D. Provide wastewater flow diversion in accordance with the Section 01520 – Sewer Flow Control (when required).

3.02 MANUFACTURER CERTIFICATION

A. The manufacturer shall certify the Contractor is properly trained in the method or system being used.

3.03 PIPE LAYING

A. Accurately place pipe to the exact line and grade shown on the Plans.

1. Control of vertical and horizontal alignments shall be accomplished by the use of a laser beam instrument.

    a. When a laser is used, the elevation and alignment of the pipe shall be checked by transit and level rod:

        1) Every fifty (50) feet for pipe smaller than thirty (30) inches

        2) Every joint for pipe thirty (30) inches and larger.

        3) Other methods of controlling vertical and horizontal alignments may be used if specifically authorized by the Owner's Representative.

2. The pipe section may be adjusted by the use of "come-along" of approved design and anchorage.

    a. Bumping or snatching (with backhoe or crane, etc.) to adjust pipe after placement in the trench, will not be permitted.

3. The Contractor shall furnish all labor and materials necessary for controlling and documenting the line and grade.

B. External point repair:

1. Lines shall be laid straight and depth of cover shall be maintained uniform with respect to finish grade, whether grading is completed or proposed at time of pipe installation.

2. No abrupt changes in direction or grade will be allowed.

C. Each piece of pipe and special fitting shall be carefully inspected before it is placed, and no defective pipe shall be laid in the trench.

1. Before a sewer pipe is placed in position in the trench, the bottom and sides of the trench shall be carefully prepared.

2. Pipe laying shall proceed upgrade, starting at the lower end of the grade and with the bells uphill.

3. Trench inverts (bottoms) found to be unsuitable for foundations:

a. Over-excavate to remove unsuitable material,

b. Bring back to exact line and grade with foundation backfill as recommended in Section 02324 – Trenching and Trench Backfilling.

c. Or as directed by the Owner's Representative.

D. Bell holes shall be of sufficient size to allow ample room for properly making the pipe joints.

1. Cut bell holes no more than five (5) joints ahead of pipe laying.

2. Carefully grade the bottom of the trench between bell holes so the pipe barrel will rest on pipe bedding laid on a solid foundation for its entire length.

3. Each joint shall be laid so it will form a close concentric joint with adjoining pipe and avoid sudden offsets or inequalities in the flow line.

E. Water shall not be allowed to run or stand in the trench while pipe-laying is in progress or before the trench has been backfilled.

1. At no time shall the Contractor open up at more trench than the available dewatering system is able to dewater.

2. Movement of water (no matter what the cause) tending to erode or affect the trench walls or trench bottom will not be allowed.

F. Thoroughly inspect each pipe after it has been laid and joined.

1. Clean the interior of each pipe removing all earth, trash, rags and other foreign matter.

G. Backfilling of trenches shall be started immediately after the pipe is in place and the joints completed, inspected, and approved by the Owner's Representative.

H. Each night or at other times when work has been suspended:

1. Securely seal off open ends of pipe and fittings to the satisfaction of the Owner's Representative using approved commercially manufactured plugs or caps,

2. Prevent entry of water, earth or other substances and animals.

3.04 JOINT CONSTRUCTION

A. Bell and spigot pipe:

1. Clean the inside of all bells and the outside of all spigots to remove all dirt, water, or other foreign matter so their surfaces are clean and dry when the pipes are joined.

2. The use of manufacturer recommended joint lubricant is required.

B. Rubber ring gasket joints for sewer pipe shall be installed in accordance with the pipe manufacturer's specifications and recommendations.

1. Extreme care shall be used in joining pipe to avoid damaging the rubber ring or displacing it from the proper operating position.

C. Joints on bell and spigot ductile iron pipe sewers shall be compression joints,

1. Mechanical or flanged joints shall be installed in accordance with the pipe manufacturers' specifications and recommendations.

B. Completed joints shall be inspected by the Owner's Representative before they are covered.

1. Any leaks or defects discovered at any time after completion of the Work shall be repaired immediately at the Contractor's sole expense.

2. Testing of new gravity sewers shall be performed in accordance with the requirements of Section 02650 – Testing for Acceptance of Sanitary Sewers.

3. All pipes and appurtenances in place shall be carefully protected from damage until the backfilling operations have been completed.

4. Any pipe disturbed after jointing shall be removed, the joint cleaned and remade and the pipe re-laid at the Contractor's expense.

3.05 LATERAL TEE CONNECTIONS

A. Tee branches shall be installed in sanitary sewer lines at points shown on the Plans or as directed by the Owner's Representative.

1. If such branches are not to be used immediately, they shall be closed with approved stoppers and shall be physically restrained.

B. Tees shall be installed in sanitary sewers to:

1. Properly connect each existing customer.

2. Serve each vacant lot facing or abutting on the street or alley in which the sewer is being laid

3. At such other locations as may be designated by the Owner's Representative.

4. The exact location of each connection shall be recorded by the Contractor, on the record drawings, utilizing conventional GPS survey, before backfilling and said records delivered to the Owner's Representative.

3.06 CONNECTING RISERS

A. Where the depth of cut is over eight (8) feet or where the grade of a sanitary sewer is lower than necessary to drain abutting property, and at such other

locations as may be designated by the Owner's Representative:

1. Install risers to connect each existing house and to serve each vacant lot facing or abutting on the street on which the sewer is being laid.

B. Connecting risers shall be sized in accordance with the plumbing code in effect at the time of construction, but shall not be smaller in size than shown on the Plans.

1. Risers shall be installed from a tee connection to the elevation needed to connect house services, the elevations shown on the Plans, or as directed by the Owner's Representative.

2. The tee connection shall be installed at the location shown on the Plans, and in accordance with the Detail Drawings.

3. Open ends of connecting risers shall be closed with approved stoppers and be physically restrained.

4. Backfilling shall be carefully done around risers using materials specified in Section 02324 – Trenching and Trench Backfilling, and compacted to the equivalent density of the surrounding undisturbed material.

3.07 CONNECTING EXISTING SANITARY SEWERS TO NEW SANITARY SEWERS

A. All new sanitary sewers shall be connected to existing sanitary sewers as shown on the Plans or as directed by the Owner's Representative.

1. Connections shall be made by constructing a manhole or utilizing an existing manhole.

B. Connecting lateral collector sewers to large diameter trunk sewers shall be made at existing manholes or new manholes.

1. Connecting to existing manholes shall be made by:
   a. Coring a hole in the wall of the existing manhole,

   b. Installing a boot,

   c. Inserting one end of a minimum length of eighteen (18) feet of pipe through the boot into the manhole,

   d. Filling around same with non-shrinking grout

   e. Troweling the inside and outside surfaces of the joint to a neat finish.

3.08 TOLERANCES

A. Invert Elevations:

1. The invert elevations shown on the Plans shall be for the invert at the

centerline of the precast concrete manhole.

a. Verify the elevation of the sewer installed at the manhole prior to setting the laser or other vertical alignment control system for the sewer upstream of the manhole.

b. Should the elevation differ from what is shown on the Plans, the Contractor shall take the following corrective action:

1) If the sewer is laid at negative grade: remove and reinstall the sewer at the correct grade at no additional cost to the Owner.

2) If the sewer is laid at a grade less than shown on the Plans (reducing the sewer's capacity):

a) Owner's Representative may require the sewer to be removed and re-laid at the correct grade at no additional cost to the Owner.

b) As a minimum, the grade to the next upstream manhole shall be adjusted so the next upstream manhole shall be set at the correct elevation.

3) If this causes no conflicts with upstream existing utilities or obstructions:

3.09 PIPE PROTECTION

A. Adjust the grade of the next upstream manhole so the next upstream manhole shall be set at the correct elevation.

1. If such an adjustment, in the Owner's opinion, is substantial,

a. The grade adjustment shall be spread over multiple sections of the sewer.

2. If such an adjustment, in the Owner's Representative opinion, significantly reduces the sewer's capacity,

B. The Owner's Representative may require the Contractor to remove and relay that portion of the sewer laid at the improper grade.

C. Trench Cut-Off Walls are required on steep slopes in excess of 20 percent and other locations as shown on the plans to prevent erosion of the backfilled trench.

3.10 CONCRETE ENCASEMENT

A. Provide concrete encasement of pipe where shown on the plans, or as required of the DeKalb County Department of Watershed Management Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards, Latest Edition and Version. If required by the Owner's

Representative, provide calculations verifying that the encased pipe will not surpass the capacity of the unsuitable foundation material and cause a sag in the new line.

B. Submit mix designs for concrete to the Owner's Representative for approval.

3.11 FLOWABLE FILL

A. Furnish and place flowable fill where shown in the plans, or as directed by the Owner's Representative.

1. Potential applications include:

    a. Abandonment of pipe.

    b. General backfill for trenches.

B. Conform to the requirements of the Georgia Department of Transportation Specifications, current edition, Section 600 for controlled low strength flowable fill and requirements set forth in Section 02324 – Trenching and Trench Backfilling.

C. Submit mix designs for flowable fill to the Owner's Representative for approval.

3.12 ABANDONMENT OF GRAVITY SEWER LINES

A. Do not begin cut, plug and abandonment operations until replacement sewer has been constructed and tested, and all service connections have been installed.

B. Sewer pipelines specifically identified to be abandoned in-place shall be slurry filled with flowable fill and the ends plugged.

1. Grout Plugs shall be cement-based dry-pack grout conforming to ASTM C 1107, Grade B or C.

    a. Plugs will be a minimum of 12 inches thick in mains 15-inches and larger and a minimum of 6 inches thick in mains smaller than 15-inches.

2. Manufactured Plugs shall be a commercially available plug or cap specifically designed and manufactured to be used with pipe being abandoned. Wing nut type 'plumber's plugs are not acceptable for use.

3. Plugging method and materials to be approved by the Owner's Representative.

C. Sewer laterals shall be cut and capped at the main or property line, as directed by the Owner's Representative.

D. Trowel smooth abandoned main lines inside the manhole that they connect to.

1. Eliminate pockets in the areas of the abandoned pipes potentially trapping debris and sewer solids.

2. Any grout in the main sewers and/or manholes remaining in service shall be removed by the Contractor at no cost to the Owner.

3.13 TESTING

A. New manholes shall be vacuum tested in accordance with the requirements Section 02650 – Testing for Acceptance of Gravity Sanitary Sewers.

B. New gravity flow sanitary sewer and joints shall be low pressure tested in accordance with the requirements of Section 02650 – Testing for Acceptance of Gravity Sanitary Sewers.

C. Testing shall be performed in the presence of the Owner's Representative.

D. Testing for external point repairs after the joints have been completed that shall be inspected using CCTV inspection per Section 01510 - Sanitary Sewer Main Television and Sonar Inspection.

1. Post-installation CCTV inspection shall take place as quickly after completion of each section as feasible, but in no case more than forty-eight (48) hours thereafter.

    a. Submit the post-installation inspection within forty-eight (48) hours after the completion of the CCTV inspection.

    b. Repairs shall demonstrate the full and effective rectification of the extant defect and/or obstruction, including infiltration etc., to the complete satisfaction of the Owner's Representative.

2. The post construction CCTV inspection is not required for repairs performed prior to pipe-bursting or pipe replacement.

3.14 CLEANUP

A. Remove all debris and construction materials and equipment from the Work Site after completion of each section of sewer line;

1. Grade and smooth over the surface on both sides of the line;

2. Leave the entire construction area in a clean, neat, and serviceable condition.

B. Dispose of debris and liquids properly in accordance with all applicable laws.

1. The local municipality can furnish a letter to the landfill stating the Contractor is authorized to dispose of the non-hazardous materials.

2. Debris and liquids type and quantities are to be tracked in the daily Contractor diary.

3. Hauling and disposal costs will be borne by the Contractor.

4. Restore the Work Site to the original or better condition in accordance with requirements of Section 02276 – Site Restoration and Erosion Control.

C. Prior to requesting a final inspection, the Contractor shall remove and dispose of all shipping timbers, shipping bands, boxes, and other like debris brought to the Work Site.

D. Repair or replace lawns, fences, drainage culverts, or property damaged by the sewer construction to equal or better condition than existing prior to commencement of the Work.

E. All shoulders, ditches, culverts, and other areas affected by the sewer construction shall be at the proper grades and smooth in appearance to provide positive drainage of the Work Site.

F. All manhole covers shall be brought to grade, as shown on the Plans, or as directed by the Owner's Representative.

1. Manholes in the unpaved area shall be above grade according to the local municipal Design Standards.

3.15 WARRANTY

A. The Contractor shall guarantee his work for a warranty period of one (1) year from the date of final acceptance. For point repairs, the warranty period shall be one additional year for a total of two (2) years from the date of final acceptance.

B. Within the warranty period, the Owner's Representative may inspect the work, and, if repairs are needed, the repairs shall be made on a case by case basis at no cost to the Owner.

C. If the frequency of similar defects requiring repair increases, then the entire project will be re-evaluated.

END OF SECTION

SECTION 02700

PAVEMENT REPAIRS

PART 1 — GENERAL

1.01 SECTION INCLUDES

Guidelines and requirements for pavement replacement.

A. Procedures and requirements for surface preparation.

B. Equipment requirements for appropriate completion of the Work.

C. Requirements for asphaltic concrete placement and compaction.

D. Requirements for pavement milling.

E. Requirements for the cleaning and protection of pavement operations.

F. Requirements for the installation and replacement of Standard Granite Curb, Grade B.

G. Specifications for temporary pavement repairs.

H. Requirements for specialty brick paver replacement.

I. Requirements for special brick sidewalk replacement.

1.02 RELATED SECTIONS

A. Section 02710: Concrete Curbs, Gutters, and Sidewalks

B. Section 03300: Cast-In-Place Concrete

1.03 REFERENCES

A. ASTM C94 - Standard Specification for Ready Mix Concrete.

B. ASTM C33 - Standard Specification for Concrete Aggregates.

C. ASTM C150 - Standard Specification for Portland Cement.

D. ACI 301 - Specifications for Structural Concrete.

E. ACI 304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.

F. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

G. ASTM A497 - Welded Deformed Steel Wire Fabric for Concrete Reinforcement.

H. ASTM C494 - Chemical Admixtures for Concrete.

I. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.

J. ASTM D3371 - Standard Specification for Viscosity-Graded Asphalt Cement for use in Pavement Construction.

K. ASTM D946 - Standard Specification for Penetration Graded Asphalt Cement for use in Pavement Construction.

L. AI (Asphalt Institute) - MS-2- Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.

M. AI (Asphalt Institute) - MS-3- Asphalt Plant Manual.

N. AI (Asphalt Institute) - MS-8- Asphalt Paving Manual.

O. AI (Asphalt Institute) - MS-19 - Basic Asphalt Emulsion Manual.

P. AASHTO M147-65 - Materials for Aggregate and Soil Aggregates.

Q. ASTM C-136 - Sieve Analysis of Fine and Coarse Aggregates.

R. Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition.

1.04 SUBMITTALS

A. The Contractor shall submit asphalt mix design to the Owner's Representative for approval.

B. The Contractor shall submit tack and prime coat along with temporary and permanent marking materials.

C. The Contractor shall submit certification of quality control and compliance with the requirements of this section. Certificates must be signed by asphalt and concrete producers and the Contractor.

1.05 PERFORMANCE REQUIREMENTS

A. The Contractor shall comply with the performance standards and requirements established by the Georgia Department of Transportation (latest edition).

B. Pavement shall be designed for movement of trucks up to 60,000 lbs.

C. In addition to other specified conditions, the Contractor shall comply with the following minimum requirements:

1. Finished asphaltic concrete courses shall be compacted to the following densities:

a. Asphaltic Concrete Hot Mix Surface Course; Not less than ninety-two (92) percent of theoretical density.

b. Asphaltic Concrete Hot Mix Binder Course: Not less than ninety (90) percent of theoretical density.

2. On the day following placement of asphaltic materials, samples for the determination of in-place density shall be taken from the finished pavement. The Contractor's or Owner's testing agent shall core the samples at locations and in the manner directed by the Owner's Representative. The cuts made in taking such samples shall be repaired by the Contractor at no expense to the Owner other than for materials.

3. The finished surface, when checked with a ten-foot straightedge placed parallel to the centerline, shall show no variation more than one-quarter (¼) inch for base and intermediate courses, and not more than one-eighth (1/8) inch for surface courses. All testing will be made in a longitudinal direction at intervals as directed by the Owner's Representative. Surface deviations for intermediate courses may be corrected by skin patching, feather-edging, or other methods providing the required smoothness and maintain quality material. However, surface deviations for surface courses shall be corrected to maintain a quality pavement having the same uniform texture and appearance as the adjoining surface. All corrective work shall be performed at the expense of the Contractor.

D. The Contractor shall conform to latest edition of all applicable codes and standards for paving work on public and private properties.

1.06 JOB CONDITIONS

A. Weather Limitations:

1. The Contractor shall apply bituminous prime and tack coats only when the ambient temperature in the shade is at least forty (40) degrees F.

2. The Contractor shall not conduct paving operations when the surface is wet, frozen, or contains excess moisture preventing uniform distribution and required penetration.

3. The Contractor shall construct asphaltic courses only when atmospheric temperature in the shade is above forty (40) degrees F, when the underlying base is dry and when weather is not rainy.

4. The Contractor shall place base course when air temperature is above forty (40) degrees F and rising. The Contractor shall not place base course on a frozen or muddy subgrade.

5. Subgrade shall be proof-rolled before placement of base course and all soft, spongy or rejected areas repaired at contractor's expense.

B. Traffic Control:

1. The Contractor shall maintain vehicular and pedestrian traffic during paving operations, as required for other construction activities.

2. In addition, the Contractor shall provide certified flagmen, barricades, and warning signs for the safe and expeditious movement of traffic through construction zones within public rights-of-way.

C. The Contractor shall establish and maintain the required lines and grades, including crown and cross-slope, for each course during construction operations. Temporary and permanent pavement markings/striping shall conform to the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition.

1.07 QUALITY ASSURANCE

A. The Contractor shall perform Work per the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition.

B. The Contractor shall obtain materials from the same approved source throughout the duration of the paving Work.

C. The Contractor shall use only approved materials furnished by a bulk asphalt concrete producer regularly engaged in production of hot-mix, hot-laid asphalt concrete.

1.08 SOURCE QUALITY CONTROL

A. The Contractor shall submit proposed mix design of each class of mix to the Owner's Representative for review prior to commencement of the Work.

B. The Owner's independent testing laboratory shall test samples per AI MS-2.

C. Designs shall be submitted in timely fashion near the beginning of project to allow for review time.

1.09 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed.

B. The Owner's independent testing laboratory shall take samples and perform tests per the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition.

1.10 PROTECTION

A. Immediately after placement, the Contractor shall protect pavement from mechanical injury for seven (7) days.

PART 2 — PRODUCTS

2.01 FLEXIBLE PAVEMENT

A. All materials shall be on the Georgia Department of Transportation's Qualified Products List (QPL).

B. Aggregates for asphaltic concrete shall comply with the applicable requirements of the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition.

C. Asphaltic Cement for asphaltic concrete shall comply with the applicable requirements of the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition Bituminous Prime Coat shall comply with the applicable requirements of the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition.

D. Bituminous Tack Coat shall comply with the applicable requirements of the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition.

E. Hot Mix Asphaltic Concrete construction shall comply with the applicable requirements of the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition.

2.02 RIGID PAVEMENT

A. Concrete and reinforcing bars (where required) for rigid pavement shall conform to GDOT requirements. Concrete for pavement shall be Class A.

2.03 CURB AND GUTTER

~~**A.**~~ Concrete for curb, curb and gutter, or valley gutter shall be Class A. Concrete shall conform to the requirements of Section 02710 – Concrete Curbs, Gutters, Sidewalks, and Driveways.

2.04 SIDEWALKS

A. Concrete for sidewalks shall be Class A conforming to the requirements of Section 02710 – Concrete Curbs, Gutters, Sidewalks and Driveways.

2.05 DRIVEWAYS

A. Concrete for driveways shall be Class A conforming to the requirements of Section 02710 – Concrete Curbs, Gutters, and Sidewalks and Driveways.

2.06 STANDARD GRANITE CURB, GRADE B

A. Curbs shall be furnished in standard lengths of eight (8) feet in so far as possible employing shorter lengths where required so the minimum length employed shall not be less than four (4) feet long. Curb sections shall have a split face and split top. Each joint shall have an unreinforced concrete footing. On wheel chair ramps and driveways, the granite curb shall continue through depressed sections of these elements. On curved sections of roadway, the granite curb shall be split or

cut on the curve.

2.07 SPECIALTY BRICK PAVER REPLACEMENT

A. The Contractor shall verify the size, type, color, and pattern of the existing specialty brick pavement surface prior to removal. The Contractor shall submit to the Owner's Representative for review the proposed replacement brick paver material and installation information. Materials shall conform to the existing installation for pattern, color, and size.

2.08 SPECIALTY BRICK SIDEWALK REPLACEMENT

A. All brick shall be solid pavers conforming to the requirements of the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, Latest Edition. The Contractor shall submit to the Owner's Representative for review on the brick to be used to replace brick sidewalks within the Project area. Materials shall conform to the existing installation for pattern, color, and size and be on current GDOT QPL

PART 3 — EXECUTION

3.01 PAVEMENT REPLACEMENT

A. The Contractor shall obtain prior approval from the Owner's Representative for any paving subcontracts.

B. The Contractor shall replace all pavements following the guidelines established by the Georgia Department of Transportation and other authorities having jurisdiction.

C. Where paved streets, sidewalks, driveways, and gutters are removed or damaged by the Contractor beyond the specified construction limits they shall be replaced per these specifications at the Contractor's expense. At any time an existing road (other than under GDOT jurisdiction), is cut longitudinally for a distance greater than one hundred (100) feet the extent of curb to curb restoration shall be provided as per the County Standards.

D. Where chert, gravel, slag, or other unpaved street or driveway surfaces are removed or damaged, they shall be replaced with the same type of materials removed as an incidental part of the Work and no specific payment shall be allowed. Unpaved drives shall be topped with gravel at no additional cost to the Owner.

E. In replacing pavements and unpaved surfaces, the materials used and the construction methods shall comply with the applicable requirements of the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition.

F. All concrete pavement replaced shall not be less than four (4) inches thick or equal to the original if greater than four (4) inches.

G. Pavements replaced shall be of the same type of construction as was removed, except no asphalt surface replaced shall be less than three (3) inches thick consisting of a binder and seal coat. Wearing surfaces shall be slag sealed in accordance with the requirements established by the Georgia Department of Transportation.

3.02 SURFACE PREPARATION

A. Graded Aggregate Base Course:

1. The Contractor shall check subgrade for stability, conformity with elevations and cross-section immediately before placing aggregate base material.

2. The Contractor shall place aggregate base material in compacted layers not more than six (6) inches thick.

3. The Contractor shall spread, shape, and compact all aggregate base material deposited on the subgrade during the same day. The subgrade shall be compacted and proof-rolled.

4. The compacted base shall have sufficient stability to support construction traffic without pumping.

5. If compacted base becomes unstable as a result of too much moisture, the base material and underlying subgrade, if necessary, shall be dried and reworked to a moisture content that can be re-compacted and not exhibit signs of pumping.

B. Loose and Foreign Material:

1. The Contractor shall remove loose and foreign material from the surface immediately before application of prime and paving.

2. The Contractor shall use power brooms or blowers, and hand brooming as required.

3. The Contractor shall not displace surface material.

C. Prime Coat:

1. The Contractor shall uniformly apply at a rate of 0.20 to 0.50 gallon per square yard over compacted and cleaned sub base surface.

2. The Contractor shall apply enough material to penetrate and seal, but not flood the surface.

3. The Contractor shall allow material to cure and dry as long as required to attain penetration and evaporation of volatiles, and in no case less than twenty-four (24) hours, unless otherwise acceptable to the Engineer.

4. The Contractor shall blot excess asphalt with just enough sand to prevent

pick-up under traffic.

5. The Contractor shall remove loose sand before paving.

D. Tack Coat:

1. The Contractor shall dilute material with equal parts of water and apply to contact surfaces of previously constructed asphalt concrete or Portland cement concrete and similar surfaces.

2. The Contractor shall apply at a rate of 0.05 to 0.15 gallons per square yard of surface.

3. The Contractor shall apply tack coat by brush to contact surfaces of curbs, gutters, manholes, and other structures projecting into or abutting asphalt concrete pavement.

4. The Contractor shall allow surfaces to dry until material is at a condition of tackiness to receive pavement.

3.03 EQUIPMENT

A. The Contractor shall provide size and quantity of equipment to complete the work specified in this section. Note: If breakdown rolling is going to be done to establish production compaction, then the same rollers and operators need to be used. Any changes should require a new breakdown strip.

B. Bituminous pavers shall be in good operable condition, self-propelled and spread hot asphalt concrete mixtures without tearing, shoving, or gouging surfaces, and control pavement edges to true lines without use of stationary forms.

C. Rolling equipment shall be self-propelled, steel-wheeled, or pneumatic-tired rollers that can reverse direction without backlash.

D. The Contractor shall provide rakes, lutes, shovels, tampers, smoothing irons, pavement cutters, portable heaters, and other miscellaneous small tools to complete the work specified in this section.

3.04 ASPHALTIC CONCRETE PLACEMENT

A. The Contractor shall place asphalt concrete mix on prepared surfaces, spread, and strike-off using paving machine.

B. Mix design maximum and minimum temperatures should govern. The Contractor shall spread the asphaltic concrete mixture at a minimum temperature of two-hundred and twenty-five (225) degrees F. Contractor shall closely monitor temperature of the asphaltic concrete mixture delivered to the project and deposited in the paver. Material that drops below the target temperature shall be removed from the project. Material shall be delivered and deposited without segregation.

C. Inaccessible and small areas may be placed by hand.

D. The Contractor shall place each course at a thickness such that when compacted it will conform to the indicated grade, cross-section, finish thickness, and density indicated in the Plans.

E. Pavement Placing:

1. Unless otherwise directed by the Engineer, the Contractor shall begin placing asphaltic concrete along the centerline of areas to be paved on crowned section, and at high side of sections on one-way slope, and in direction of traffic flow.

2. After first strip has been placed and rolled, the Contractor shall place succeeding strips and extend rolling to overlap previous strips.

3. The Contractor shall complete base courses for a section before placing surface courses.

4. The Contractor shall place the asphaltic concrete mixture in as continuous an operation as practical.

F. Hand Placing:

1. The Contractor shall spread, tamp, and finish the asphaltic concrete mixture using hand tools in areas where machine spreading is not possible, as acceptable to Owner's Representative.

G. The Contractor shall place the asphaltic concrete mixture at a rate ensuring handling and compaction before mixture becomes cooler than acceptable working temperature. Material that cools beyond acceptable limits shall be removed.

H. Joints:

1. The Contractor shall carefully make joints between old and new pavements, or between successive days work, to ensure a continuous bond between adjoining Work.

2. The Contractor shall construct joints to have the same texture, density, and smoothness as adjacent sections of asphalt concrete course.

3. The Contractor shall clean contact surfaces free of sand, dirt, or other objectionable material and apply tack coat.

4. The Contractor shall offset transverse joints in succeeding courses not less than twenty-four (24) inches.

5. The Contractor shall cut back edge of previously placed course to expose an even, vertical surface for full course thickness.

6. The Contractor shall offset longitudinal joints in succeeding courses not less

than six (6) inches.

7. When the edges of longitudinal joints are irregular, honeycombed, or inadequately compacted, the Contractor shall cut back unsatisfactory sections to expose an even, vertical surface for full course thickness.

3.05 ASPHALTIC CONCRETE COMPACTION

A. The Contractor shall provide sufficient rollers to obtain the required pavement density.

B. The Contractor shall begin rolling operations as soon after placing as the mixture will bear weight of roller without excessive displacement.

C. The Contractor shall not permit heavy equipment, including rollers, to stand on finished surface before it has thoroughly cooled or set.

D. The Contractor shall compact the asphaltic concrete mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.

E. The Contractor shall start rolling longitudinally at extreme lower side of sections and proceed toward center of pavement. The Contractor shall roll to slightly different lengths on alternate roller runs.

F. The Contractor shall not roll centers of sections first under any circumstances.

G. Breakdown Rolling:

1. The Contractor shall accomplish breakdown or initial rolling immediately following rolling of transverse and longitudinal joints and the outside edge.

2. The Contractor shall operate rollers as close as possible to paver without causing pavement displacement.

3. The Contractor shall check crown, grade, and smoothness after breakdown rolling.

4. The Contractor shall repair displaced areas by loosening at once with lutes or rakes and filling, if required, with hot loose material before continuing rolling.

5. The Contractor shall follow breakdown rolling as soon as possible, while the asphaltic concrete mixture is hot and in condition for compaction.

6. The Contractor shall continue second rolling until the asphaltic concrete mixture has been thoroughly compacted.

7. The Contractor shall perform finish rolling while the asphaltic concrete mixture is still warm enough for removal of roller marks.

8. The Contractor shall continue rolling until roller marks are eliminated.

9. The Contractor shall remove and replace defective areas.

10. The Contractor shall cut-out and fill with fresh, hot asphalt concrete.

11. The Contractor shall compact by rolling to specified surface density and smoothness.

12. The Contractor shall remove deficient areas for full depth of course.

13. The Contractor shall cut sides perpendicular and parallel to direction of traffic with edges vertical.

14. The Contractor shall apply tack coat to exposed surfaces before placing new asphaltic concrete.

3.06 PAVEMENT MILLING

A. In street areas where pavement replacement occurs, pavement milling will be performed by the Contractor to eliminate excessive buildup of pavement. The depth and are of milling will as directed by the Owner's Representative. The Contractor shall assume milling will be performed in 2" depths, unless otherwise directed.

3.07 CLEANING AND PROTECTION

A. Cleaning: After completion of paving operations, the Contractor shall clean surfaces of excess or spilled asphalt materials to the satisfaction of the Engineer.

B. Protection:

1. After final rolling, the Contractor shall not permit vehicular traffic on asphaltic concrete pavements until it has cooled and hardened and in no case no sooner than six (6) hours.

2. The Contractor shall provide barricades and warning devices as required to protect pavement and the general public.

C. Maintenance: The Contractor shall maintain the surfaces of pavements until the acceptance of the Work. Maintenance shall include replacement, overlaying, milling, and reshaping as necessary to prevent raveling of the road material, the preservation of smooth surfaces and the repair of damaged or unsatisfactory surfaces, to the satisfaction of the Owner's Representative.

3.08 TEMPORARY ROADWAY PAVING REPAIRS

A. Temporary cold or permanent hot asphalt patching will be required for both transverse and longitudinal roadway cuts upon completing backfilling requirements at the end of each day's work if the road is to be opened for local traffic while work has stopped.

B. It shall be the Contractor's responsibility to maintain the temporary paving in such

condition as to prevent hindrance or hazard to traffic. When final paving is undertaken the temporary surfacing materials shall be removed to accommodate final paving of types and thicknesses as specified in this section, the edges of the existing paving shall be neatly and uniformly trimmed, and the permanent pavement shall be placed.

C. Steel Plate Bridging

1. At the Owner's Representative's discretion, steel plate bridging may be used. The Contractor must adhere to the following chart with respect to minimum plate size and thickness.

Trench Width	Minimum Plate Thickness
10" (0.25 m)	½" (13 mm)
1'-11" (0.58 m)	¾" (19 mm)
2'-7" (0.80 m)	7/8" (22 mm)
3'-5" (1.04 m)	1" (25 mm)
5'-3" (1.60 m)	1 ¼" (32 mm)
*For trench widths greater than 5' 3", the Engineer will determine the plate thickness.	

2. Steel plates used for bridging must extend a minimum of twelve (12) inches beyond all edges of the trench.

3. For traffic speeds less than forty-five (45) mph, the surrounding pavement shall be cold planed to a depth equal to that of the steel plate selected.

4. For traffic speeds greater than forty-five (45) mph, approach plate(s) and ending plate (if longitudinal placement) shall be attached to the roadway by a minimum of two (2) dowels pre-drilled into the corners of the plate and drilled two (2) inches into the pavement. Subsequent plates shall be butted to each other. Fine graded asphalt concrete shall be compacted to form ramps, maximum slope eight and one-half (8½) percent with a minimum twelve (12) inches taper to cover all edges of the steel plates. When steel plates are removed, the dowel holes in the pavement shall be backfilled with either graded fines of asphalt concrete mix, concrete slurry, or equivalent slurry that is satisfactory to the Owner's Representative.

5. Steel plates shall not be left on the road for more than the minimum required days for the timely and expeditious performance of paving.

6. Crusher Run Aggregate Temporary patch paving using crusher run aggregate (8910 stone) shall be placed and maintained only as approved and directed by the Owner's Representative. All compacted material shall conform closely enough to the existing road surface so as to permit safe travel.

7. Crusher run aggregate shall consist of coarse crushed stone, crushed slag fragments, or Portland cement concrete fragments blended with crushed

particles of the same material.

3.09 STANDARD GRANITE CURB, GRADE B

A. This work shall consist of furnishing and installing the standard granite curb where indicated in the Plans or directed by the Owner's Representative. In general, granite curb to be installed shall match existing granite curb either removed or damaged in the progress of the Work.

B. Installing standard granite curb, Grade B, shall include saw cutting existing asphalt concrete pavement a minimum of one (1) inch and removing remaining pavement to subgrade, excavating base and subgrade as necessary to install the granite curbing and backfilling and compacting the installation.

3.10 REPLACEMENT OF EXISTING BRICK PAVEMENT

A. This work shall consist of replacing existing brick pavement removed to install sanitary sewers or connection of services.

B. Existing brick pavers removed to accommodate sanitary sewers or services or damaged by the Work shall be removed in neat; rectangular sections the full width of the pavement as shown on the Plans. Existing concrete base slabs shall be cut with a concrete saw and removed prior to replacement. Replacement construction shall match existing pavement section, including concrete base slab.

3.11 SPECIALTY BRICK SIDEWALK REPLACEMENT

A. This work shall consist of replacing existing brick sidewalks removed for connecting services or for installing sanitary sewers.

B. Existing brick sidewalk removed to accommodate the sanitary sewers or services or damaged by the Work shall be removed in neat, rectangular sections the full width of the sidewalk or driveway on a line perpendicular to the street. Existing concrete base slabs shall be cut with a concrete saw and removed prior to replacement. Brick pavers shall be laid on a four (4)-inch thick concrete base slab and meet the same requirements as Standard Concrete Sidewalk four (4) inches thick.

END OF SECTION