

EXHIBIT 1 (Revised May 6, 2024)

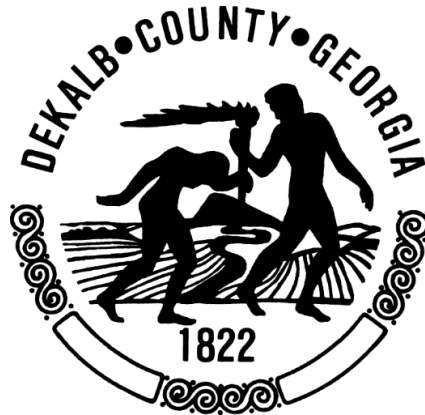
Technical Specifications ITB No. 24-101625

for

Consent Decree – Major Gravity Sewer Line Capacity Restoration (Multiyear Contract)

2024

Owner:



DeKalb County

Department of Watershed Management

1580 Roadhaven Drive

Stone Mountain, Georgia 30083

(770) 414-6181

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SECTION 01010
SUMMARY OF WORK

PART 1 – GENERAL

1.01 PURPOSE AND NEED

- A. DeKalb County Department of Watershed Management's (DWM) Wastewater Collection and Transmission System (WCTS) includes an estimated 2,700 miles of sanitary sewer lines, 66 lift stations and 70,000 manholes. Per the Consent Decree (CD) entered with the United States Environmental Protection Agency, the County is implementing continuous sanitary sewer assessment and rehabilitation aimed at minimizing sanitary sewer overflows (SSOs). Pursuant to this effort, DWM developed the Priority Areas Sewer Assessment and Rehabilitation Program (PASARP) to provide for the identification, delineation, prioritization and rehabilitation of priority areas within DWM's WCTS and the Ongoing Sewer Assessment and Rehabilitation Program (OSARP). OSARP is to provide for the identification, delineation, prioritization, and rehabilitation of the remaining areas within DWM's WCTS as well as the ongoing maintenance of the entire WCTS. This contract will support this effort in two ways. Primarily, this contract is to address urgent sanitary sewer maintenance and rehabilitation needs identified through assessment in the OSARP and the Maintenance Management System (MMS) Program. Secondly, this contract will also be used to perform cleaning on large diameter trunk sewers and provide additional capacity in the WCTS for potential development. These needs are enumerated below in section C. DWM has not mandated the use of any specific type of equipment or methods, however; the Contractor shall utilize the nationally recognize NASSCO published PACP and MACP standards for conducting all inspections. The Contractor shall have CCTV/Sonar equipment capable of off-road use and easement reels for off-road cleaning.
- B. This is a multi-year contract that the County anticipates awarding to multiple Contractors, dependent upon the number of bids received and accepted by the County. All quantities represented on each line item of the Bid Form are the estimated total quantities for the scope of work to be done under each line item for the life of this Contract. The Bidders are being informed that the actual estimated quantities to be awarded in a contract to each successful bidder could vary dependent on the number of successful bidders. The County reserves the right to award this contract in any manner it chooses depending on the number of bids received.
- C. The Work will include, but is not limited to, the following work activities to perform the tiered assessment inspections and to gain access to perform the inspections as further defined in the Specifications of this Contract:
1. Obtain permits from governing agencies.
 2. Obtain Right of Entry where required (i.e., when entering private property).
 3. Cleaning of gravity sewer mains.
 4. Cleaning of sewer manholes.
 5. Easement access clearing and route construction.
 6. Manhole rehabilitation.
 7. Locating, Exposing, and Raising manholes.

8. Light and heavy cleaning of sewer mains.
 9. CCTV (to 18") and CCTV/Sonar (TISCIT, no upper limit) inspection.
 10. Bypass pumping.
 11. Asset (sewer main and manhole) locating and GPS data collection where required.
 12. Erosion Control as required for access road construction and other land disturbing activities.
 13. Site Restoration as a result of providing access to assets, including but not limited to removal and/or replacement of pavement, hardscape & landscaping features.
 14. Coordination with DWM's Community Outreach requirements which are meant to minimize impact to the citizens of DeKalb County.
 15. Coordination with DWM's DOT contact representative for permitting.
 16. Coordination with work by others.
- D. The Contractor may be requested to provide a proposal for pipe replacement or for construction of an offset alignment. This work would be rare and would not exceed the length of 1500 LF per proposal. The Contractor will provide coordination with others to obtain easements and provide as-built drawings sealed by an engineer or surveyor licensed with the State of Georgia. A Work Change Directive (WCD) will be initiated to facilitate a cost proposal for each instance of this work. See Measurement and Payment (01025).
- E. All Work shall be performed in accordance with the requirements of the Contract Documents. Performance of the work shall meet the more stringent of the Guidance Specifications or the latest DeKalb County Department of Watershed Management Design Standards Manual.
- F. The Contractor shall perform work conforming to the Pipeline Assessment & Certification Program (PACP) for pipe inspections and the Manhole Assessment & Certification Program (MACP) as defined by the National Association of Sewer Service Companies (NASSCO) for all inspection and assessments as applicable and required of the Contract Documents.
- G. Establish horizontal and vertical control utilizing RTK/GPS methodology. Primary horizontal control used or set, shall comply with Second Order Class II (1:20,000) or better. Primary vertical Control used or set, shall be Second Order Class II (0.035√m) or better

1.02 PROJECT LOCATION

- A. The Work is required at multiple locations County-wide.

1.03 WORK COORDINATION

- A. The Contractor shall coordinate the Work with third parties (such as public utilities, other DeKalb County departments, and emergency service providers) in areas where such parties may have rights to underground property or facilities; and request maps or other descriptive information as to the nature and locations of such underground facilities or property.
- B. The Contractor shall coordinate the Work with owners of private and public property where access is required for the performance of the work. The Contractor will be

required to obtain authorized access from property owners and provide documentation to the Program Manager of such authorization as further described in the Contract Documents.

- C. The County, through the Program Manager:
 - 1) will work with the Contractor to assign and schedule the work in a logical and efficient format.
 - a) All items in this contract shall be priced so each item can be assigned independently or combined with other items at the County's sole discretion in regard to both quantity and scope.
 - b) There shall be no consideration of any claim for extra payment arising from a decision by the County in how it assigns, what it assigns and to whom it assigns potential work orders under this contract.
 - c) No consideration of any claim or extra payment will be considered for extra payment arising from a decision to assign potential work items under this contract in any combination or in combination with another contract utilizing alternates by the Department of Watershed Management at the prices specified herein.

1.04 CONDITIONS AT THE SITES

- A. The Contractor shall make all necessary investigations to determine the existence and location of underground utilities and surface impacts that may be caused due to the work.
- B. The Contractor will be held responsible for any damage to and for maintenance and protection of existing utilities, structures, and personal property.
- C. Nothing in these Contract Documents shall be construed as a guarantee that utilities are not located within the area of the operations.

1.05 CHANGES IN THE AGREEMENT

- A. If and to the extent of any inconsistency, ambiguity, conflict, discrepancy or error in the Agreement Documents (a "discrepancy"), Contractor shall immediately notify the Owner in writing and seek clarification from the Owner (within 24 hours of discovery). In the event that the Owner fails to clarify such discrepancy within a reasonable time under the circumstances, Contractor shall proceed with the Work and give precedence to the Agreement Documents in the following order of priority:
 - 1. Written modifications (including without limitation Change Orders) issued after execution of the Agreement;
 - 2. Addenda issued in writing prior to the execution of the Agreement;
 - 3. the Agreement;
 - 4. Addendum, if any, to the General Requirements and Special Conditions;
 - 5. Special Conditions;
 - 6. General Requirements;
 - 7. Specifications;
 - 8. Plans and Drawings

PART 2 – PRODUCTS

(not used)

PART 3 – EXECUTION

(not used)

END OF SECTION

SECTION 01015
CONTROL OF WORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

This section includes the general use of the site including properties inside and outside of the right of way, work affecting existing utilities, roadways, streets, driveways, and traffic patterns. This section also includes requirements for notification to adjacent landowners and occupants.

1.02 PERSONNEL – COOPERATION WITHIN THIS CONTRACT

- A. The Contractor shall furnish the manpower and equipment efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will ensure the completion of the work within the time stipulated in the Contract Documents and comply with interim milestones specified in Section 1.02A. The County has determined this to be a minimum of 2 TISCIT crews and 2 cleaning crews to be available within 60 days of NTP. If at any time such project progression appears to the County to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he or the Program Manager may order the Contractor to increase the project equipment and/or manpower, and the Contractor shall conform to such order. Failure of the County to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.
1. Milestone – The Contractor is expected to complete 1/3 of the quantities appropriated for CCTV and Sonar/TISCIT by the end of the 1st year following notice to proceed. The Contractor is expected to complete an additional 1/3 during the second year, and finish in the 3rd year. Failure to meet these milestones may result in corrective action, including recommendation to terminate the contract.
- B. All firms or persons authorized to perform any work under this Contract shall:
1. Cooperate with the General Contractor and his subcontractors or trades,
 2. Assist in incorporating the work of other trades where necessary or required.
 3. Comply with the requirements of all local state and federal agencies and other utility/facility Owners.

PART 2 – PRODUCTS

(not used)

PART 3 – EXECUTION

3.01 INSTALLATION

A. PRIVATE LAND

The Contractor shall not enter or occupy any private land outside of easements, except by permission of the property owner and the County per the Public Notification requirements listed in all applicable Specification Sections.

The Contractor shall precisely and thoroughly document the location, condition of all private property features just prior to any disturbance or access. This would include location of features, species of trees bushes, etc. and all other pertinent information. Any failure to do so may require the Contractor, at the Contractor's expense to complete all restoration requirements required by property owners regardless of their validity. In such occurrences, the contractor shall provide to the County, a written release from the property Owner.

B. PIPE LOCATIONS

The Contractor will be provided access to the County's GIS system through the Cityworks Computerized Maintenance Management System (CMMS). This map will provide the general location of the County's Sanitary Sewer Collection System as well as manhole asset ID's.

C. OPEN EXCAVATIONS

1. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other acceptable and effective means to prevent accidents to persons, and damage to property.
 - a. All work shall meet OSHA Standards
2. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by Owner's Representative, pedestrians and workmen. Bridges provided for access to private property during construction shall be removed when no longer required.
 - a. Required clean up and restoration will be equal to or better than original condition of site.
3. Maximum length of open trench is not to exceed:
 - a. 100 feet ahead of pipe laying and backfilling in paved areas
 - b. 200 feet ahead of pipe laying and backfilling in unimproved areas.
 - c. Shorter lengths of open trench may be required by surrounding conditions to minimize interference existing facilities, etc.
 - 1) This will be evaluated on a case-by-case basis.
4. Open excavation shall not restrict traffic or become a hazard.
 - a. Use construction procedures (such as limiting the length of open trench, prohibiting deposition of excavated material in the street, prohibiting the storage or stockpiling of materials in the street or on sidewalks)

5. Take precautions to prevent pedestrians/public from entering any construction zone.
 - a. Use all available measures to prevent injury including applying all applicable OSHA standards.
 - b. Night watchmen may be required where special hazards exist
 - c. Police protection provided for traffic while work is in progress.
 - d. The Contractor shall be fully responsible for damage or injuries

D. MAINTENANCE OF TRAFFIC

1. Temporary Traffic Control shall be in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) including necessary certifications as indicated in the Manual for responsible individuals (MUTCD Part 6C.01.03).
2. Unless permission to close the street is received in writing from the proper authority, all excavated material shall be placed so vehicular and pedestrian traffic may be maintained at all times. If the Contractor's operations cause traffic hazards, the Contractor shall repair the road surface, provide temporary ways, erect wheel guards or fences, or take other measures for safety.
3. Detours around construction or assessment will be subject to the approval of the County and/or Program Manager and permitting authority. Where detours are permitted, the Contractor shall provide all necessary barricades and signs as required to divert the flow of traffic. While traffic is detoured, the Contractor shall expedite construction operations to minimize impacts to the flow of traffic. Allowable periods when traffic is being detoured will be strictly controlled by the County.
4. The Contractor shall take precautions to prevent injury to the public due to open trenches. Night watchmen may be required where special hazards exist, and/or police protection provided for traffic while work is in progress. The Contractor shall be fully responsible for damage or injuries whether or not police protection has been provided. Uniformed police officers from the jurisdiction in which the work is being performed are required where temporary traffic control extends through a signalized intersection and/or when required as a requirement of the permitting authority.

E. WORK WITHIN GDOT RIGHT-OF-WAY

1. All roadway restoration shall be done in accordance with the lawful requirements of the authorities within whose jurisdiction such pavement is located.
2. All highway utilities and traffic controls are to be maintained and work shall conform to the rules and regulations of the authorities, including the use of standard signs.
3. Conduct no construction operations in, and remain clear of the work area outside the hours allowed by the permit and Contract. The most stringent shall apply.

4. The Contractor shall furnish all such bonds or checks required by the highway authorities to ensure proper restoration of paved areas.

F. CARE AND PROTECTION OF PROPERTY

1. The Contractor shall be responsible for the preservation of all public and private property and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done. Pre and post photographs of the access route across the property are recommended.
2. All sidewalks disturbed by the Contractor's operations shall be restored to their original condition by the use of similar or comparable materials. All curbing shall be restored in a condition equal to the original construction and in accordance with the best modern practice.
3. Along the location of this work all fences, walks, bushes, trees, shrubbery, and other physical features shall be protected and restored in a thoroughly workmanlike manner. Fences and other features removed by the Contractor shall be replaced in the original location as soon as conditions permit. All grass areas beyond the limits of construction damaged by the Contractor shall be regraded and seeded or sodded to match existing ground cover.
4. The protection, removal, and replacement of existing physical features along the line of work shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the unit and/or lump sum prices established under the items in the Contract Documents.

G. PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

1. The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities in the street, such as pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the Contractor's operations shall be repaired by him at his expense.
2. Protection and temporary removal and replacement of existing utilities and structures as described in this Section shall be considered as extra work and all costs in connection therewith shall be as outlined in the Contract Documents.
3. If, in the opinion of the County, permanent relocation of a utility is required, he may direct the Contractor, in writing, to perform the work. Work so ordered will be paid for at the Contract unit prices, if applicable, or as extra work under the General Conditions. If relocation of a privately owned utility is required, the County will notify the Utility to perform the work as expeditiously as possible. The Contractor shall fully cooperate with the County and Utility and shall have no claim for delay due to such relocation. The Contractor shall notify public utility companies in writing

at least 48 hours (excluding Saturdays, Sundays, and legal holidays) before excavating in any public way.

H. WATER FOR CONSTRUCTION PURPOSES

The approval of the County shall be obtained before County water is used. Hydrants shall only be operated under the supervision of the County. Contractor shall be responsible for obtaining a hydrant meter from the County for this water use as directed by the Program Manager. Contractor shall be responsible for all costs and water charges associated with the use of a hydrant meter(s).

I. SANITARY LANDFILL

The Contractor is responsible for the proper removal and disposal of any debris and sedimentation in the existing sewers, laterals, and manholes, etc., attributable to the work under this Contract. The debris and liquids are to be disposed of properly in accordance with all applicable laws. The County/Program Manager will furnish a letter to the County Sanitation Department stating the contractor is authorized to dispose of the non-hazardous materials at the Seminole Road Landfill. 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.

J. MAINTENANCE OF FLOW

The Contractor shall at his own cost, provide for the flow of sewers, drains, and water courses interrupted during the progress of the work. The entire procedure of maintaining existing flow shall be fully discussed with the County well in advance of the interruption of any flow.

3.02 CLEANUP

During the course of the work, the Contractor shall keep the site of his operations in as clean and neat a condition as possible. The Contractor, at his own cost, shall dispose of any and all residues resulting from the construction work and, at the conclusion of the work; the Contractor shall remove and haul away any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from the construction operation. The Contractor shall leave the entire work site in a neat and orderly condition.

END OF SECTION

SECTION 01016
CONTROL OF MATERIALS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This section includes the responsibilities of the Contractor regarding materials used on the project.

1.02 RELATED SECTIONS

- A. Section 01300 - Submittals

1.03 QUALIFICATIONS

- A. Only new materials and equipment shall be incorporated in the work.
 - 1. Materials and equipment furnished shall be subject to the inspection and approval of the Owner's Representative. Contractor shall be responsible for the close inspection, storage, maintenance and protection of all materials and equipment delivered and used in the project
 - 2. No material shall be delivered to the job site without prior approval of the Owner's Representative.
 - 3. No materials or equipment shall be delivered to the project for which the manufacturer's published storage and handling instructions have not been provided
 - 4. Like items of products furnished and installed in the Work shall be end products of one manufacturer and of the same series or family of models.
- B. The materials and equipment used on the work shall correspond to the approved samples or other data.
- C. Manufacturer's Certificate Of Compliance

When required by Owner's representative, a Manufacturer's Certificate of Compliance, shall be provided and signed by entity supplying the product, material, or service, and submitted prior to shipment of product or material or execution of the services.
- D. Engineer may permit use of certain materials or assemblies prior to sampling and testing if accompanied by accepted certification of compliance.

1.04 SUBMITTALS

- A. Within two (2) weeks of receiving the Notice-To-Proceed, the Contractor shall submit to the Program Manager a complete schedule of submittals and submittal log for review and approval. The Contractor shall submit either Action or Informational submittals on a timely basis as indicated in the schedule to not delay the Work. Such

submittals shall be in sufficient detail to enable the Program Manager to identify the particular project and to form an opinion as to its conformity to the Specifications.

- B. The Contractor shall submit data and samples to permit consideration and approval before materials are necessary for incorporation in the work.
 - 1. Allow for a 10 working day review time for Owner/Program Manager.
 - 2. Any delay of approval resulting from the Contractor's failure to submit samples or data promptly or from required re-submittal shall not be used as a basis of a claim against the Owner.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Facilities and labor for handling storing, maintaining and inspecting all materials and equipment shall be furnished by the Contractor.
- B. At the Program Manager request, either prior to beginning or during the progress of the work,
 - 1. The Contractor shall submit samples of materials for such special tests as may be necessary to demonstrate conformity to the specifications.
 - 2. Samples shall be furnished, stored, packed, and shipped as directed at the Contractor's expense.
 - 3. Except as otherwise noted, the Program Manager will make arrangements and pay for the tests.

PART 2 — PRODUCTS (Not Used)

PART 3 — EXECUTION (Not Used)

END OF SECTION

SECTION 01020
ALLOWANCES

PART 1 – GENERAL

1.01 SECTION INCLUDES

This section includes administrative and procedural requirements governing allowances.

1.02 QUALIFICATIONS AND REQUIREMENTS

- A. Contractor agrees that the allowance is for the sole use of the County to cover approved unanticipated costs and other items associated with the work.
- B. Selected materials, equipment, and installation can be included in Contract Documents by allowances.
 - 1. Allowances are established to defer selection or scope until more information is available.
 - 2. Other requirements will be issued by a Change Order.
- C. Allowances are included in the Bid Tab for miscellaneous modifications, additional work necessary to provide access to the system for assessment, and other unforeseen conditions.
 - 1. Miscellaneous modifications,
 - 2. Additional inspection and testing,
 - a. Inspection and testing allowances include the cost of engaging any third party inspection or testing agency
 - b. Costs for reporting results
 - c. Costs for actual inspections and tests
 - d. Tree recompense costs
 - e. Permit fees other than County and Municipal
 - 3. Other unforeseen conditions.
- D. Procedures for submitting and handling Change Orders are included in General Requirements of these Contract Documents.
 - 1. For work covered under this Section, the Contractor will provide a cost proposal for the work to be accomplished under the allowance and for

consideration by the Program Manager. No work will be authorized without a written Work Directive issued by the County/Program Manager.

2. Related expenses not associated with current pay items may be submitted for consideration for approval under this section to the Program Manager.
- E. The allowance does not include incidental labor required to assist the County, or costs for retesting on failure of previous tests and inspections. The allowance does not include costs of services listed or proposed by Contract Documents.
- F. Any unused allowances will be returned to the County.

1.03 SCHEDULE OF ALLOWANCES

The Allowance will include but not be limited to the following:

- A. Unforeseen Conditions:
 1. Miscellaneous work to be accomplished at the direction of the County. It shall include items of work consistent with and related to the project not indicated in the Contract Documents but may be necessary to the successful completion of the contractual agreement. It is expected the work under this item will be accomplished utilizing pay items indicated in the Bid Tab.
 2. All work performed under this section shall comply with the various sections of these specifications as appropriate to the specific items involved. This work shall be further described, by the County, in written form and/ or supplemental exhibits. In any event, no work will be allowed under this section without the prior written approval of the County/Program Manager.
- B. County Directed Additional Work:
 1. Provides for related sewer rehabilitation work to be performed in conjunction with this project at the direction of the County. All work performed under this section shall comply with the various sections of these specifications and industry standards appropriate to the specific items involved. This work shall be further described, by the County, in written form and/or on modifications to the Contract Documents or supplemental exhibits. In any event, no work will be allowed under this section without the prior written approval by the County.
- C. County Directed Site Restoration/Landscaping/Access
 1. Provides for site restoration work, erosion & sediment control, access construction, etc. on private or County property outside the scope of the bid items necessary to enable the contracted assessment work. Site

restoration shall only be considered for payment where property has been damaged during the course of the work, not due to contractor negligence.

D. Other Work

1. Provides for other work required under the Contract but not included in a category above.

1.04 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form of a site/activity specific cost proposal.
- B. Submit invoices or delivery slips to indicate quantities of materials delivered for use in fulfillment of each allowance.
- C. Submit any additional information required by the Owner's Representative deemed necessary to document the use of allowance monies.
- D. At Project Closeout, the unused amounts remaining in the various allowances will be credited back to the Owner.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

(Not Used)

END OF SECTION

SECTION 01025
MEASUREMENT AND PAYMENT

PART 2 – GENERAL

2.01 SECTION INCLUDES

Methods of measurement and payment for items of work under the Bidder's Unit Price Form.

2.02 SUMMARY

- A. The total bid price shall cover all work required by the Contract Documents. All costs in connection with the proper and successful completion of the work, including all materials, equipment, supplies, and appurtenances; providing all equipment and tools; and performing all necessary labor and supervision to fully complete the work, shall be included in the unit prices bid.
- B. All work not specifically set forth as a pay item in the Bidder's Unit Price Form shall be considered subsidiary obligations of the Contractor and all costs in connection therewith shall be included in the unit prices bid.
- C. All quantities stipulated in the Bidder's Unit Price Form or other Contract Documents are estimated and are to be used only
 - 1. As a basis for estimating the probable cost of the Work.
 - 2. For the purpose of comparing the bids submitted for the Work.
- D. All estimated quantities stipulated in the Bidder's Unit Price Form are total quantities for the contract. The County anticipates awarding the contract to multiple Contractors and quantities will be divided amongst the Contractors.
- E. The basis of payment for work and materials will be the actual amount of work done and materials furnished. Payment for work will be made on a linear foot, vertical foot, square foot, square yard, cubic yard, ton, hour, or lump sum, each based on the Contractor's measurement, contingent on verification by the County or County's Representative. Contractor agrees he will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished.
- F. Pay requests for work performed shall be itemized by asset. The pay request should list each asset by ID number, describe the work performed per the payment bid form, provide the unit cost, and provide the extended cost. When seeking partial payment where work was attempted and could not be completed, adequate information should be provided on the pay request to justify the amount requested. Work performed on pipes should be listed in a separate table from work performed on manholes. The Program Manager will provide an example of the table format.
- G. When submitting pay requests for periodic payment, the following documentation should be submitted at a minimum:
 - 1. Contractor Payment Checklist
 - 2. Application for Payment Form

3. Payments Summary Sheet
4. Narrative of Work Performed
5. LSBE Report(s)
6. Updated Schedule for Assigned Work Activities
7. Photo Documentation of Construction Activities Illustrating Pre and Post Conditions

Additional instructions and/or requirements may be provided by the Program Manager at the project Kick-off meeting.

2.03 MEASUREMENT AND PAYMENT

- A. Work Zone Staging and Traffic Control (Per Link)- Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Additional traffic control measures required for work in high-traffic/commercial areas will be paid for separately when authorized by the Program Manager, as follows.

Payment will be remitted for furnishing, installation, maintenance and removal of temporary traffic control per link of roadway based upon the current functional classification of the affected roadway as defined by the Federal Highway Administration per day. A roadway link is defined by two nodes or intersections. In the event a single work zone spans one or more intersections, the average link length will be used to determine the eligible quantity or work zones for payment. Each unit price bid shall include all but not be limited to furnishing, installation, maintenance and removing all traffic control devices, temporary signage, temporary pavement markings and shall include flagging and other means necessary for safe guidance and protection of vehicular and pedestrian traffic through the Work Zone per site based upon the functional classification and site conditions. When Police are required for traffic control the cost shall be included in the unit bid price. All traffic control measures and plans shall conform to the requirements of the Manual on Uniform Traffic Control Devices (MUTCD), Part 6 (Temporary Traffic Control), latest edition, as published by the US DOT / FHWA. The above referenced bid items are applicable to rehabilitation work within roadways with the following functional classifications:

1. (Bid Item 01015-01) FC17-Collector Street
2. (Bid Item 01015-02) FC16-Minor Arterial Street
3. (Bid Item 01015-03) FC14-Urban Principal Arterial Street

Functional Classification Maps for the Atlanta Metro Counties are available through Georgia's Department of Transportation (GADOT) website at:

<http://www.dot.ga.gov/DS/Data>

In the event that a functional classification assignment conflict exists between the drawings and the GADOT, the GADOT classification shall preside. The Contractor shall submit proposed traffic control plans to required regulatory agencies and they shall grant approval before the Work begins. Notification to begin Work shall require at least 48-hour notice to the appropriate agency and the Owner. Traffic control for roadways with "local" or "rural" functional classifications are considered incidental to the Work and the cost shall be included in the unit price for the Work performed. These type roadways shall meet MUTCD requirements. No separate payment will be made for traffic control roadways with functional classification other than those stated herein, unless otherwise authorized by the Owner for exceptional circumstances.

- B. GPS Locate and Data Collection /Manhole (Level 1 & Level 2)–. Measurement for payment will be per each for the specific Level of inspection made and will constitute full compensation to locate, take coordinates, and provide attribution information as defined by the Level of Inspection per the directions provided in Section 01056. This payment includes compensation for all digital deliverables outlined in Section 01056.
1. (Bid Item 01056-01) GPS Level 1: Applies to all manholes that are found as part of the assessment process and are not mapped or are wrongly mapped on the County’s system (survey grade GPS – 1 cm accuracy).
 2. (Bid Item 01056-02) GPS Level 2: Applies to all manholes not requiring a Level 1 assessment (mapping grade GPS – 3 m accuracy).
- C. Manhole Condition Assessment, Measurement for payment will be per each (EA) manhole assessed. Payment will be full compensation for inspecting the full depth of the manhole, top and bottom conditions, and furnishing all labor, tools, equipment, public notification, data management and assessment necessary to perform all work in accordance with MACP Level 1 or Level 2 assessments as directed. Payment shall not be made until digital data files and reports are delivered and show complete and accurate information.
1. (Bid Item 01530-01) Manhole Condition Assessment Level 1 (All Depths): Applies to all manholes not requiring a Level 2 assessment (Level 2 GPS).
 2. (Bid Item 01530-02) Manhole Condition Assessment Level 2 (All Depths): Applies to all manholes that are found as part of the assessment process and are not mapped or are wrongly mapped on the County’s system (Level 1 GPS).
- D. Manhole Cleaning, Debris Removal & Disposal, All Depths: This pay item is utilized to clean those manholes found on inspection that contain debris that prevents Manhole Condition Assessment, CCTV, and SONAR/TISCIT inspections. Measurement will be by the estimated volume (CY) of debris removed from the manhole and disposed of.
1. (Bid Item 01530-01) Manhole Cleaning, Debris Removal & Disposal.
- E. Sonar/TISCIT Survey, All Diameters ≥ 18 ”, Measurement for payment will be per linear foot (LF) from center of manhole to center of manhole. Payment will constitute full compensation to perform a Sonar/TISCIT sewer pipe inspection on sewers. Defect coding, header data and coding of service lateral locations are required. There will be no separate payment made for data delivery or data quality control. Payment shall only be made for the footage of sewer associated with the manhole. Maintenance of traffic and associated traffic control measures required for the work shall be included in the unit price. Costs shall include, but not limited to, labor, equipment, transportation, setup, tools, public notification, data management and all other related procedures and materials necessary to complete the inspections, in accordance with Section 01510. The Contractor must have off-road capability for the CCTV/TISCIT and an easement reel for the cleaning equipment.
1. (Bid Item 01510-01): Sonar/TISCIT Survey ≥ 18 ” and ≤ 24 ” Diameter Pipe.
 2. (Bid Item 01510-02): Sonar/TISCIT Survey >24 ” and ≤ 36 ” Diameter Pipe.
 3. (Bid Item 01510-03): Sonar/TISCIT Survey >36 ” Diameter Pipe.

- F. Bypass Pumping: Measurement for payment will be per linear foot (LF) of the size and flow classification category for bypass pumping and temporary flow control. Payment will be full compensation for furnishing all labor, materials, equipment, setup, removal, cleanup, maintenance and operation, and incidentals necessary to produce the results specified in Section 01520.

Supplemental work associated with adding personnel, transportation, fuel etc., to operate the bypass system (after working hours or as directed) will be paid at an hourly rate to include time, materials, and all incidentals associated with the maintenance operation. Bypassing is intended to be operated and maintained by the crew on site performing other work. No payment will be considered for hourly bypass without permission of the County.

Bypass Pumping will be paid under Contract Items as follows:

1. (Bid Item 01520-01): Bypass Pumping $\geq 18"$ and $\leq 24"$ Diameter Pipe with Flow $>25\%$ and $<50\%$.
2. (Bid Item 01520-02): Bypass Pumping $\geq 18"$ and $\leq 24"$ Diameter Pipe with Flow $\geq 50\%$.
3. (Bid Item 01520-03): Bypass Pumping $> 24"$ and $\leq 36"$ Diameter Pipe with Flow $>25\%$ and $<50\%$.
4. (Bid Item 01520-04): Bypass Pumping $> 24"$ and $\leq 36"$ Diameter Pipe with Flow $\geq 50\%$.
5. (Bid Item 01520-05): Bypass Pumping $> 36"$ Diameter Pipe with Flow $\leq 50\%$.
6. (Bid Item 01520-06): Bypass Pumping $> 36"$ Diameter Pipe with Flow $>50\%$.
7. (Bid Item 01520-07): Bypass Pumping Maintenance and Operation $\geq 18"$ and $\leq 36"$ Diameter Pipe.
8. (Bid Item 01520-08): Bypass Pumping Maintenance and Operation $> 36"$ Diameter Pipe.

Measurement for payment for Bypass Pumping Maintenance and Operation will be per hour for minimum staff and equipment costs associated with maintaining an active by-pass when the work crew is on extended absence from the job site (overnight, etc.).

Bypass pumping may, at times, have to remain in operation for an extended period of time in situations when the work is stopped and workers have left the site. The Contractor shall be responsible for maintaining, monitoring, managing, and implementing a successful pump bypass operation during such occurrences.

The County will reimburse the Contractor for hourly costs associated with providing manpower, materials, and equipment necessary to continually operate the bypass system at the price bid per hour. The Contractor will provide the Program Manager the minimum personnel requirements for operating the system for review and approval prior to manning the system

for continued operation. The payment will be per LF for installation and maintenance and per hour for operation.

- G. Locate & Expose Buried Manhole, Street & Non-Street. Measurement for payment will be per each (EA) buried manhole located and exposed. There shall be no distinctions made for the diameter or invert depth of the manhole exposed. There will be no distinctions made for manholes located beneath brick, cobbles, concrete, asphalt or other hard surfaces. Those manholes located outside of paved areas are non-street manholes. Payment shall be made at the bid price for each buried manhole acceptably located and exposed and will constitute full compensation for furnishing all labor, materials, tools, and equipment necessary to perform all work. Manholes with minor ground litter and/or minor soil cover will not be considered buried if that manhole is in the approximate location provided by County records.
1. (Bid Item 02607-01) Locate and Expose buried manholes in street/paved area.
 2. (Bid Item 02607-02) Locate and Expose buried manholes not in street.
- H. (Bid item 02607-03) Sewer Manhole Height Adjustment $\leq 12"$. Measurement for payment will be per each (EA) manhole for removing the frame & cover and building up the chimney section of the manhole no more than 12 inches (reuse existing casting frame and cover). Payment will constitute full compensation for all costs for uncovering and/or adjusting each manhole to grade or higher including, but not limited to, labor, equipment, transportation, tools, and all other related procedures and materials necessary to produce the results specified in Section 02607. Replacement MH frame & cover castings, when required, will be provided by the County at no cost to the Contractor. There shall be no distinctions made for diameter of the manhole or its material composition. No separate payment shall be made for resetting existing manhole frames and covers. That work shall be considered an integral part of adjusting manholes. Manholes located in paved areas will require a concrete collar in accordance with DeKalb Standard Drawing S-006. No separate payment will be made for the concrete collar. Maintenance of traffic and associated traffic control measures required for the work shall be included in the unit price.
- I. (Bid Item 02607-04) Sewer Manhole Height Adjustment $> 12"$. Measurement for payment will be per vertical foot (VF) of manhole height adjustment exclusive of the manhole frame height. No separate payment will be made for 12" or less height adjustment Bid item 02607-1 above. Payment will constitute full compensation for all costs for uncovering and/or adjusting each manhole to grade or higher including, but not limited to, labor, equipment, transportation, tools, and all other related procedures and materials necessary to produce the results specified in Section 02607. Replacement MH frame & cover castings, when required, will be provided by the County at no cost to the Contractor. The Contractor will advise the Program Manager in writing prior to proceeding. There shall be no distinctions made for diameter of the manhole or its material composition. No separate payment shall be made for resetting existing manhole frames and covers. This work shall be considered an integral part of raising manholes. Manholes located in paved areas will require a concrete collar in accordance with DeKalb Standard Drawing S-006. No separate payment will be made for the concrete collar. Maintenance of traffic and associated traffic control measures required for the work shall be included in the unit price.
- J. (Bid item 02607-05) Replace Manhole Frame and Cover (Standard, Waterproof): Measurement for payment will be per each (EA) for replacement of manhole frame and

cover, completed and accepted. This work includes replacing manhole frames and covers that need to be replaced with the associated pavement or landscape repair made necessary by the work. Manholes located within paved areas will require a concrete collar in accordance with DeKalb Standard Drawing S-006. Payment will constitute full compensation for all costs associated with removing the existing manhole frame and cover, regardless of type, and replacing it with a new manhole frame and cover and other ancillary work. The costs include, but is not limited to, labor, equipment, transportation, tools, removal and replacement of asphalt as needed, and all other related procedures and materials necessary to produce the results specified in Section 02607. Replacement MH frame and cover will be provided by the County at no cost to the Contractor. Maintenance of traffic and associated traffic control measures required for the work shall be included in the unit price. Note, this item will not apply to Manhole Height Adjustments requiring the replacement of new frame and covers.

- K. (Bid Item 02609-01) Manhole Frame Sealing, Measurement for payment will be per each (EA). Payment will constitute full compensation for all costs for installing a manufactured or applied internal or external flexible seal to frame joints including, but no limited to, labor, equipment, transportation, tools, and all other related procedures and materials.
- L. (Bid Item 02900-01) Rebuild Invert and Bench, Measurement for payment will be per each (EA). Payment will constitute full compensation for all costs for rebuilding the invert and bench including, but not limited to, labor, equipment, transportation, tools, and all other related procedures and materials.
- M. Cleaning & Verification, 18" - >36": This item is associated with Sonar/TISCIT work. Cleaning will be classified by pipe size and the Average Cross-Sectional Area Blockage and will be determined by the actual measured (Pre-TISCIT) volume of deposits and other debris found in the pipe:
 - a. $\leq 15\%$ Blockage: Where the volume of debris/deposits/in the pipe segment calculated over the length of the total line segment equates to that of a line segment holding 15% blockage for that length (MH to MH);
 - b. 15% - 25% Blockage: Where the volume of debris/deposits/in the pipe segment calculated over the length of the total line segment equates to that of a line segment holding 15% blockage for that length but less than or equal to that calculated over the total length of the line segment holding 25% blockage for the length (MH to MH);
 - c. >25% Blockage: Where the volume of debris/deposits/in the pipe segment calculated over the length of the total line segment exceeds that of a line segment holding 25% blockage for the length of pipe (MH to MH);
 - d. If the entire length of pipe cannot be assessed, the cleaning work order will be based on the level as calculated for the length of pipe assessed.

Cleaning will not be considered complete and accepted until a Post-TISCIT verification (PACP standard) is performed indicating that deposits/obstructions are not in excess of 5%. No separate payment will be made for Mobilization/demobilization that might be required to perform the Heavy Cleaning and to continue CCTV inspection. Maintenance of traffic and associated traffic

control measures required for the work shall be included in the unit price. Costs shall include, but not limited to, labor, equipment, transportation, setup, tools, and all other related procedures and materials necessary to complete the Heavy Cleaning in accordance with Specification Section 02956.

1. (Bid Item 02956-01) Cleaning & Verification <15% Average Cross Section Area Blockage, 18"-24" Diameter.
 2. (Bid Item 02956-02) Cleaning & Verification <15% - 25% Average Cross Section Area Blockage, 18"-24" Diameter.
 3. (Bid Item 02956-03) Cleaning & Verification >25% Average Cross Section Area Blockage, 18"-24" Diameter.
 4. (Bid Item 02956-04) Cleaning & Verification <15% Average Cross Section Area Blockage, 24"-36" Diameter.
 5. (Bid Item 02956-05) Cleaning & Verification <15% - 25% Average Cross Section Area Blockage, 24"-36" Diameter.
 6. (Bid Item 02956-06) Cleaning & Verification >25% Average Cross Section Area Blockage, 24"-36" Diameter.
 7. (Bid Item 02956-07) Cleaning & Verification <15% Average Cross Section Area Blockage, >36" Diameter.
 8. (Bid Item 02956-08) Cleaning & Verification <15% - 25% Average Cross Section Area Blockage, >36" Diameter.
 9. (Bid Item 02956-09) Cleaning & Verification >25% Average Cross Section Area Blockage, >36" Diameter.
- N. Construction Exit/Entrance: Measurement for payment will be per each (EA) entrance/exit suitably installed and maintained per the *Manual for Erosion and Sediment Control of Georgia*, latest edition (designated as Co) with width reduced to 14'. Payment will constitute full compensation for all costs associated with access entrances/exits, including installation, maintenance, repair, removal, disposal, and restoration to original grade. Depending upon activity, Construction Exit/Entrance may not be required with the Construction Access Road.
1. (Bid Item 02110-01): Installation and Removal of Construction Exit/Entrance
- O. 12' Wide Easement Access Road: Measurement for payment will be per linear foot (LF) of Access Road suitably installed and maintained per the *Manual of Erosion and Sediment Control of Georgia* latest edition (designated as Cr) modified by width and no "construction entrance". Payment shall constitute full compensation for all costs associated with installation, maintenance, repair, and removal of the Access Road. Access Road Construction shall be as approved by the Program Manager. The

Contractor is reminded that off-road equipment is required for cleaning and assessment under this contract.

1. (Bid Item 02110-02): Easement Access Road – 12’ Width, Installation and Removal
 2. (Bid Item 02110-03): Easement Access Road – 12’ Width, Installation only
- P. Easement Clearing, Light & Medium: Measurement for payment will be per square yard (SY) for the type of classification category of clearing as agreed to by the Program Manager. Light clearing can be achieved with hand equipment or bush hog; medium will use more of the same but larger equipment and add wood chipper(s). Payment will constitute full compensation for easement clearing, including, but not limited to labor, equipment, transportation, tools, and other related procedures and materials necessary to remove vegetation and other debris on or near the surface of the ground in the construction area to produce the results specified in Section 02110. Easements will be cleared of debris or obstructions impeding access to work areas. Maintenance of traffic and associated traffic control measures required for the work shall be included in the unit price. The Contractor and Program Manager will inspect the site and agree upon the level of clearing and the appropriate pay item prior to the work.
1. (Bid Item 02110-04) Easement Clearing, Light (Bush Hog)
 2. (Bid Item 02110-05) Easement Clearing, Medium (Bush Hog & Chipper)
- Q. (Bid Item 02110-06) Easement Clearing, Heavy (Timbering Equipment): Measurement for payment will be per caliper inch for the type classification category of cleaning. The classification of per caliper inch will be measured at four (4) feet from the base of the tree. Heavy clearing may include similar equipment as with Light or Medium clearing but also need “timbering” equipment such as skidders or dozers. Payment will constitute full compensation for all associated costs including, but not limited to, labor, equipment, transportation, tools, and other related procedures and materials necessary to remove vegetation and other debris on or near the surface of the ground in the construction area to produce the results specified in Section 02110. Easements will be cleared of debris or obstructions impeding access to work areas. Maintenance of traffic and associated traffic control measures required for the work shall be included. The Contractor and Program Manager will inspect the site and agree upon the level of clearing and the appropriate pay item prior to the work. Where required, Erosion & Sediment Control BMP’s will be paid as a separate item.
- R. Erosion and Sedimentation Control (suitably installed and maintained per the *Manual for Erosion and Sediment Control of Georgia*, Latest Edition) and other ancillary items: Measurement for payment for the activity with which the Erosion Control Item(s) is associated shall constitute full compensation for all costs associated with Erosion and Sediment Control Best Management Practices, including installation, maintenance, repair, and removal. Quantities for payment shall be based upon actual quantity authorized by the County. Erosion and sedimentation control measures shall comply with the requirement of Sections 02110 and 02276 of these Specifications; the Georgia Erosion and Sedimentation Act of 1975, as amended; the *Manual for Erosion and Sediment Control of Georgia*, latest edition; and local soil erosion and

sedimentation control ordinances. Payment for various Erosion and Sedimentation Control devices installed and maintained will be as follows:

1. Riprap: Measurement for payment will be per square yard (SY) for riprap. Payment shall constitute full compensation for all costs associated with installation, maintenance, and repair of the Riprap. Payment will include filter fabric underlayment at a minimum 18" inch depth, or as directed by the Program Manager. When crossing a stream or ditch, the quantity eligible for payment shall be limited to 10 feet upstream and 10 feet downstream of top of disturbed area and from five feet from the top of bank, across a creek or ditch, banks and bottoms, to five feet beyond top of bank. Any other areas at creeks or ditches disturbed by the Contractor requiring riprap shall be riprapped at no cost to the County.
 - a. (Bid Item 02273-01): Riprap Type II (Installed)
 - b. (Bid Item 02273-02): Riprap Type III (Installed)
2. (Bid Item 02276-01) Tree Protection Fence: Measure for payment will be per linear foot (LF) for the tree protection fence suitably installed and maintained per the *Manual of Erosion and Sediment Control of Georgia*, latest edition. Payment shall constitute full compensation for all costs associated with tree protection fencing, including installation, maintenance, repair, and removal.
3. (Bid Item 02276-02) Check Dam (Hay Bales): Measurement for payment will be per each (EA) of check dam installed and maintained. Payment shall constitute full compensation for all costs associated with material, grading, installation suitably installed and maintained in accordance with *The Manual for Erosion and Sediment Control of Georgia*, Latest Edition, No separate payment will be made for maintenance, repair, and removal.
4. (Bid Item 02276-03) Inlet Sediment Trap: Measurement for payment will be per each (EA) for inlet sediment traps suitably installed and maintained in accordance with the Manual for Erosion and Sediment Control of Georgia, Latest Edition. Payment shall constitute full compensation for all costs associated with grading, installation, maintenance, repair, and removal. Contractor shall be responsible for installing the number of sedimentation traps to adequately capture silt, thus minimizing silt leaving disturbed sites.
5. Temporary Creek Crossing, Installed and maintained: Install, maintain and remove a temporary stream crossing utilizing culvert(s) for passage of construction vehicles across a watercourse. Measurement for payment will be made per linear foot (LF) complete temporary creek crossing suitably installed and maintained in accordance with the *Manual for Erosion and Sediment Control of Georgia*, Latest Division (designated as Sr-C) and removed. Payment shall constitute full compensation for all costs associated with grading, installation, maintenance, repair, and removal.
 - a. (Bid Item 02276-04): Temporary creek crossing $\geq 12"$ and $\leq 15"$ diameter
 - b. (Bid Item 02276-05): Temporary creek crossing $\geq 18"$ and $\leq 24"$ diameter
 - c. (Bid Item 02276-06): Temporary creek crossing 36" diameter
 - d. (Bid Item 02276-07): Temporary creek crossing 42" diameter

6. Tree/Shrubbery Replacement: Measurement for payment will be per each (EA) tree or bush removed and/or replaced for either native or ornamental species. Payment will be per the 3-gallon or 5-gallon bid item and will constitute full compensation for all associated costs for removing and replacement of the designated size of tree(s) and/or shrubbery on private property, including, but not limited to, labor, equipment, transportation, tools, and other related procedures and materials necessary. Payment will constitute full compensation for removing and replacing trees or shrubbery on private property. Replacement may include removal and replanting or replacing with new (as directed by the Owner/Program Manager) in accordance with Section 02276.
 - a. (Bid Item 02276-08): 3-gallon (installed complete)
 - b. (Bid Item 02276-09): 5-gallon (installed complete)
7. Chain Link Fence Removal & Replacement: Measurement for payment will be per linear foot (LF) of chain link fence removed and reset or replaced. Payment shall constitute full compensation for all costs associated with removing, resetting, and/or replacing fence, including materials, installation, maintenance, repair, and debris removal and other ancillary items. Payment will constitute full compensation for removing and replacing chain link fence, in kind, on public or private property in accordance with Section 02276.
 - a. (Bid Item 02276-10): Chain link fence (4 ft height)
 - b. (Bid Item 02276-11): Chain link fence (6 ft height)
 - c. (Bid Item 02276-12): Chain link fence (8 ft height)
8. Wood Fence Removal & Replacement: Measurement for payment will be per linear foot (LF) of wood fence removed, reset and/or replaced. Payment shall constitute full compensation for all costs associated with remove & replace fence, including materials, installation, maintenance, repair, and debris removal and other ancillary items. Payment will constitute full compensation for removing, resetting and/or replacing wood fence, in kind, on public or private property in accordance with Section 02276.
 - a. (Bid Item 02276-13): Wood fence (4ft height)
 - b. (Bid Item 02276-14): Wood fence (6ft height)
 - c. (Bid Item 02276-15): Wood fence (8ft height)
9. Unsuitable Soil Replacement (select backfill)- Measurement for payment will be per cubic yard (CY) compacted in place as defined below. All costs for hauling off the unsuitable material, hauling and placing imported fill material shall be included in the unit price. Payment will be made on a basis of cubic yards (CY) compacted in place. When allowed by the Owner, in non-paved areas the compaction may be less than ninety-five percent (95%) however not less than ninety percent (90%) of the maximum dry density. In non-paved areas unsuitable soil for final backfill shall be replaced at the Owner's direction. This pay item includes from the top of the pipe bedding zone to final grade. Separate payment will be made for surface restoration. Payment for materials testing shall be made separately.
 - a. (Bid Item 02324-01): Crusher Run (per CY)
 - b. (Bid Item 02324-02): Imported Fill (per CY)

10. (Bid Item 02485-01) Sodding: Measurement for payment will be made per square yard (SY) of sod installed and accepted. Payment shall constitute full compensation for all costs associated with fine grading, fertilizing, and sodding, including ancillary work (including watering if necessary), on previously landscaped areas on public or private property in accordance with Section 02485. Disturbed areas shall be sodded only when directed to do so by the Program Manager.
 11. (Bid Item 02486-01) Seeding: Measurement for payment will be made per square yard (SY) of seed and straw in place and accepted. Payment shall constitute full compensation for all costs associated with fine grading, fertilizing, and seeding, including ancillary work, previously landscaped areas on public or private property in accordance with Section 02486. Grass seeding shall match in kind the existing adjacent grass of previously landscaped areas. Soil preparation and/or topsoil shall be included.
 12. Silt Fence: Measurement for payment will be made per linear foot (LF) for Type C silt fence single or double row as required, suitably installed and maintained in accordance with the *Manual of Erosion and Sediment Control of Georgia*, Latest Edition. Payment shall constitute full compensation for all costs associated with Silt Fence, including, but not limited to installation, maintenance, repair, and removal.
 - a. (Bid Item 02542-01): Silt Fence – Type C, Single row
 - b. (Bid Item 02542-02): Silt Fence – Type C, Double row
- S. Hydrant Meter/Water Consumption Charges: The Contractor will pay all fees associated with the acquisition, monthly charges, and water consumption associated with the Contract. The Contractor will report the water usage to the Project Manager monthly.
- T. Sanitary Landfill: The Contractor will pay all disposal fees associated with the utilization of the County's Seminole Road Landfill. The Contractor will report the monthly tare weight totals for Seminole Road Landfill to the Project Manager monthly.

END OF SECTION

SECTION 01030
SPECIAL PROJECT PROCEDURES

PART 1 – GENERAL

1.01 SECTION INCLUDES

This section includes responsibilities and requirements of the Contractor specific to this project.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

3.01 INSTALLATION

- A. The Contractor shall provide labor and material in a timely manner and of sufficient quantities to result in the performance of, but not limited to, the following:
1. Daily containment and removal of all sanitary debris, work debris and trash resulting from any work activities identified within the Contract Documents. Disposal locations for any sanitary debris and/or hazardous materials shall be legally certified to accept these materials and approved prior to disposal. Manifests of hauling and disposal of such material shall be submitted to the Program Manager by the Contractor. Hauling and disposal costs will be borne by the Contractor.
 2. The following shall apply regarding Contract Documents:
 - a. The Contract Documents are complementary; what is required by one is as binding as if required by all.
 - b. Bring any discrepancies between the drawings and specifications to the attention of the Owner's Representative immediately.
 - c. Except as may be otherwise specifically stated in the Contract Documents, or as otherwise directed by the Owner's Representative, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and the provisions of any standard, other specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents).
 - d. The Contractor shall assume that the most stringent shall apply
 3. Coordinate with all trades and other County or Program Manager work that may occur at or near the project location as generally described below.
 4. It is this Contractor's responsibility to advise the Program Manager as to any discrepancies in the work of others prior to starting the work.
 5. All field engineering and layout required for this work shall be the responsibility of this Contractor.

6. All protection of work in progress and finished work until the project is completed and final acceptance is granted by the Program Manager, including the work of others when it affects work in this project or becomes part of this project, shall be the responsibility of this Contractor.
7. The Contractor agrees to attend meetings promptly and their company will be represented with an authorized field representative and an authorized office representative capable and responsible for committing to delivery, manpower and completion dates for their work orders
8. The Contractor agrees all forms, schedules, narratives, and reports (including technical data reports and forms) required by the County and Program Manager will be completed as required of these Specifications or as otherwise directed. Failure to submit these in an acceptable manner and completed on time could result in a delay in payment.
9. The Contractor agrees all Change Order work will be agreed upon in writing and signed by the Program Manager and the County before this work will begin.
10. The Contractor agrees to properly monitor and protect all materials and County assets from damage resulting from Contractor's work activities or weather and assumes responsibility to replacement of such materials at their cost. This cost will be assessed by back charge or other means allowed by the Contract Documents.
11. The Contractor agrees to work within the defined work hours of the County being typically 8:00 a.m. to 5 p.m. Monday through Friday, except for defined holidays, or other hours as directed by the County or Program Manager to adhere to the requirements of the Work, including:
 - a. Work within a public Right-of-Way
 - b. Compliance with local jurisdiction and State DOT requirements for defined work hours and days.
 - c. Work related to Public Outreach and Notification.
12. The Contractor agrees to perform all necessary overtime as ordered to get their work back on schedule if necessary.
 - a. If due to this Contractor's failure to perform in a timely manner, premium time is required by any other Contractor(s) to bring the project back to the original schedule, the cost of such premium time shall be borne solely by the Contractor. Contractor is subject to repayment of additional cost incurred by the Owner due to Owner's staff's overtime or premium time necessary to monitor the Contractor's efforts to bring the Work back on schedule or complete a task that requires work outside of normal work hours.
 - b. Such overtime shall be governed by the requirements and restrictions of the Contract Documents and any applicable jurisdictional permits, and shall not violate any noise ordinances or pose any danger or undue nuisance to the public.
13. Perform punch list work in a timely manner or be subject to Owner overhead costs. Punch list items, and completion of such items, will be created and completed as stipulated in this Specification.

- a. Contractor shall first review the Work and develop a punch list.
 - b. Contractor shall provide a copy to the Owner's Representative
 - c. Contractor shall complete the work on his punch list and provide the Owner's Representative with a signed off copy
 - d. Owner's Representative will review the Work and if determined to be reasonably complete will develop a punch list - If in the opinion of the Owner's Representative, the Work is determined not to be reasonably complete, the Contractor shall be advised to bring the Work closer to a point of completion that warrants a punch list by the Owner's Representative.
 - e. Contractor shall complete the items on the list provided by the Owner's Representative. At an agreed upon schedule the Owner's Representative and the Contractor shall review the progress and the completion of each punch list item.
 - f. Owner overhead costs will be established and provided to the Contractor.
 - g. Owner overhead costs will be assessed if punch list items are not completed on the agreed upon schedule and reoccurring inspections are required.
 - h. Overhead cost will be based on total job related costs of the Owner and will be assessed against the retainage.
14. The Contractor agrees to provide certificates of insurance prior to their mobilization. Prior to commencing work provide a current copy of the workman's compensation and liability insurance certificate. Contractor will maintain insurance current and provide proof throughout the project.
 15. The Contractor assumes responsibility for insurance coverage on all their equipment and tools against theft and damage. No claims will be registered against the County for loss or damage of same. The Contractor will not lien the project for payment of any claims on equipment loss or damage due to vandalism or any other form.
 16. The Contractor will abide by all OSHA requirements and/or instruction from the Program Manager and/or supervising and/or competent field personnel to make a safe work area. OSHA requirements to be the minimum safety level accepted. The Contractor shall maintain all responsibility for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work.
 17. All vehicles at the work site shall be the property of the Contractor and marked with an identifiable company sign. Personal vehicles shall not be parked at the specific work sites.
 18. Contractor agrees to respond to all Contractor change notifications within 24 hours and further to provide the Program Manager and/or County with the complete change estimate cost data within 7 calendar days.
 19. Contractor shall provide fulltime onsite, dedicated, qualified, and suitable supervision of their work.

- a. Notify Owner's Representative of name, qualifications and contact information for person designated to perform onsite supervision
 - b. Notify Owner's Representative of change of onsite supervisor immediately. No change shall be permitted without Owner's written permission.
 - c. Person designated to perform onsite supervision shall have no other responsibilities.
20. Contractor agrees to perform work in accordance with agreed upon schedule and will provide any necessary measures required to achieve and maintain this schedule at no additional cost to the County, Program Manager and County's Representative.
 21. Contractor agrees to provide all required submittals and receive approvals relative to crew supervisory personnel, manpower safety and training certifications, and equipment specifications prior to performing any field work. The Contractor will not occupy any assigned job site without a properly badged workforce and having other permissions including an approved Traffic Control Plan.

B. RESPONSIBILITY FOR OVERFLOWS/SPILLS AND DAMAGE TO PROPERTY AND UTILITIES:

1. It shall be the responsibility of the Contractor to schedule and perform the Work in a manner not causing or contributing to incidences of sanitary sewer overflows (SSOs) as defined in the latest Consent Decree.
2. In the event the Contractor's activities cause or contribute to SSOs, the Contractor shall immediately take appropriate action to contain and/or stop the overflow; cleanup the spillage, and disinfect the area affected by the SSO. Simultaneously, the Contractor will notify the County's Dispatch Center, the County, and the Program Manager to provide information concerning location, cause, volume of the SSO, and assessment whether the spill entered a stream or storm drain. The Contractor shall be familiar with the details of spill response referred to in the Sanitary Sewer Overflow Contingency and Emergency Response Plan (CERP) approved by County. This document can be found on Department of Watershed Management website under the Consent Decree Program or upon request to the County or Program Manager.
3. The Contractor shall indemnify and hold harmless the County and the County's Representatives (including the Program Manager) for any fines or third-party claims for personal or property damage arising out of an SSO that is fully or partially the responsibility of the Contractor, including the legal, engineering, and administrative expenses of the County and County's Representatives (including the Program Manager) in defending such fines and claims.
4. Any damage to public or private property due to the work performed by the Contractor is the sole responsibility of the Contractor. Any damage to County or private utilities caused by the Contractor's equipment or operation shall be repaired in a manner approved by the County/Program Manager at the Contractor's expense. Any damage

caused by the Contractor to utilities or property belonging to other entities shall be repaired by the Contractor to the satisfaction of the utility/property owner at the Contractor's sole expense. Any equipment stuck or left in the sewer line/lateral shall be retrieved by the Contractor within twenty-four (24) hours. The Contractor is expected to use due caution when cleaning and assessing the sewer line segments and equipment stuck in the line due to the Contractor's negligence will require that equipment be recovered at the sole expense of the Contractor. If the equipment becomes lodged during the course of normal activities and not as a result of Contractor negligence or misuse, the removal will be paid per the price bid for external point repair. If the equipment becomes lodged during the course of normal activities due Contractor negligence or misuse, the removal will be the financial responsibility of the Contractor. Should the reason for the lodged equipment be undetermined, the County will share 50% of the cost of retrieval with the Contractor. The Contractor is to notify the Program Manager and County prior to initiating retrieval. Any damage to the Contractor's equipment is the Contractor's sole responsibility. If the equipment is stuck or left in the sewer line/lateral causes an SSO, then the Contractor is liable for the SSO and all associated damages.

5. The County (and the Program Manager) reserves the right to make any repairs or retrieve any equipment and charge the Contractor accordingly.

C. RELOCATIONS

1. Relocate (including all associated work) structures, such as:
 - a. light poles,
 - b. fences,
 - c. piping,
 - d. conduits,
 - e. and drains interfering with the positioning and execution of the Work.
2. Work so ordered will be paid for at the Contract unit prices, if applicable, or as extra work under the Allowance Bid Item. Reference Section 01015 Part 3 – Execution Installation 3.01 G. Protection and Relocation of Existing Structures and Utilities.
3. Effective and suitable temporary provisions necessary for public safety resulting from such relocations, shall be provided by the Contractor at no additional cost to the Owner

D. EXISTING UNDERGROUND PIPING, STRUCTURES, AND UTILITIES

1. The attention of the Contractor is drawn to the fact that during any earth disturbing activity, the possibility exists of the Contractor encountering various water, gas, telephone, electrical, or other utility lines not indicated. The Contractor shall exercise extreme care before and during any land disturbing activity to locate and flag these lines so as to avoid damage to the existing lines. Should damage occur to an existing line, the Contractor shall repair or pay for repairs to the line to the satisfaction of the County and at no cost to the County. If the County

requires the use of their own forces to repair the damaged lines, the Contractor shall pay for all repair costs.

2. The locations of existing underground piping structures and utilities are shown without express or implied representation, assurance, or guarantee that they are complete or correct or that they represent a true picture of underground piping to be encountered.
3. The existing piping and utilities that interfere with any assessment or construction to facilitate assessments shall be rerouted as shown, specified, or required. Before any piping and utilities not shown on the Drawings are disturbed, the Contractor shall notify the Program Manager of the location of the pipeline or utility and shall reroute or relocate the pipeline or utility as directed.
4. The Contractor shall exercise care in locating existing piping and utilities. All utilities, which do not interfere with complete work, shall be carefully protected against damage. Any existing utilities damaged in any way by the Contractor shall be restored or replaced by the Contractor at its expense as directed by the Program Manager.

E. HAZARDOUS LOCATIONS

1. The existing wet wells, manholes and related areas may be considered hazardous locations, in that explosive concentrations of sewage gas may be present. Compliance with 29 CFR 1910 and 1926 is required at all work locations.

F. WATER FOR CONSTRUCTION PURPOSES

1. Water as required for the work identified in the Contract will be furnished by the County if readily available connections are present and only as approved by the Program Manager. There shall be installed in each and every connection to the County's potable water supply, a backflow preventer and calibrated metering device meeting the requirements of the County. The Contractor is expected to pay all fees associated with the meter usage (monthly charge, consumption fee). The Contractor will report monthly water consumption to the Program Manager on a monthly basis.

G. SANITARY LANDFILL

1. Sanitary Landfill facilities located at the County's Seminole Road Landfill will be provided to the Contractor for the proper disposal of cleanings and other debris generated through the work. The Contractor is responsible for the proper removal and disposal of any debris and sedimentation in the existing sewers, laterals, and manholes, etc., attributable to his work under this Contract. The debris and liquids are to be disposed of properly in accordance with all applicable laws. The County/Program Manager will furnish a letter to the County Sanitation Department stating the contractor is authorized to dispose of the non-hazardous materials at the Seminole Road Landfill. Debris and liquids type and quantities are to be tracked in the daily Contractor diary. The

Contractor is expected to pay all disposal fees associated with the landfill. The Contractor will report the monthly tare weights for Seminole Road Landfill usage to the Program Manager on a monthly basis.

H. CITYWORKS

1. The Contractor will be required to provide updates to work orders received via the County's Cityworks asset management platform as work progresses. The Contractor can choose to update the daily progress at the end of the workday or at the beginning of the following workday, prior to starting the work. It is recommended to update the work order while the work is being done in field. The intent is for the Contractor's work progress performed during the day to be entered and viewable to the Program Manager by the start of the Contractor's next work day. The Contractor shall provide field and office staff names and email addresses to the Program Manager for login access to the Cityworks platform, and Contractor will be responsible for providing a computer or tablet with internet access for use of the system. The Program Manager will provide access to the site, technical support, and training of up to three hours of instruction detailing how the Contractor shall receive and populate the work orders. The Contractor will provide appropriate employees for training at no cost to the County.

I. MOBILE MAPPING TOOL

1. The Contractor will be required to provide daily updates to a live web mapping tool to document the location and progress of the smoke testing work. The tool will display the County's sewer system and asset identification numbers as well as the work area limits. The Contractor shall provide their own tablet or laptop with internet connection and shall download the free app "Collector for ArcGIS" by ESRI Collector (latest version is 18.0.3 compatible with AGOL 10.3) application if using a tablet. Each crew shall be equipped with mobile mapping capabilities to update the work progress during the day. The Contractor can choose to update the day's progress at the end of the day or the next day prior to beginning work. The intent is for the Contractor's work progress performed during the day to be entered and viewable to the Program Manager by the start of the Contractor's next work day. The Contractor shall provide an email address so that the Program Manager may set up a login for Contractor access to the web mapping tool. The Contractor will be able to perform simple edits to the web map such as placing points/symbols on assets on which work has been performed. Symbols will primarily represent the type of work accomplished. The Program Manager will provide the mobile mapping tool to the Contractor, including access and technical support. The Contractor shall provide any necessary hardware. The Program Manager will provide up to two hours of instruction on how the contractor shall populate the live web mapping tool.

J. DAILY CCTV/TISCIT/CLEANING VERIFICATION PRODUCTION REPORTS

1. For tracking purposes, the Contractor will provide Daily Production Logs for crews involved in CCTV, TISCIT, and verification of cleaning as soon

as the Contractor's QA/QC process is completed but no later than one work week (5-days) after the work is completed. These reports of raw data will be utilized to check progress toward completion of the various areas assigned.

K. SCHEDULE

1. For inspection purposes the Contractor will provide a Daily Schedule for crews providing the starting location and service output for the various crews working. This schedule will be submitted to the County early each workday (as soon as routing is determined by the Contractor and before 8:00 AM as a minimum) so as to assist the County in making Inspector assignments.
2. In addition, the Contractor will provide a two week look ahead schedule, every two weeks for the duration of the Contract to be discussed at the Bi-Weekly Progress Meetings. This schedule should indicate planned staffing and crew activity activities associated with the Contract during each two- week period.
3. The Contractor is expected to perform a field review of the work assigned and provide the County with a schedule for completion of that assignment. This schedule must take into account field conditions found on inspection, the need for jurisdictional permits, jurisdictional police officers, rights-to-enter, access issues (fences, dogs, people, terrain, brush, et al) and the Contractor's plan to remedy the conditions so as to expedite the work.

L. DATA DELIVERABLE REQUIREMENTS

1. The Contractor is expected and required to perform quality control on all deliverables before submitting to the Program Manager/County. This may include, but is not limited to, ensuring all data naming conventions as described in the specifications are met and consistent, all media files listed in the submitted databases are included, and any work that could not be completed is addressed. The Program Manager will provide a PACP/MACP QC tool System Condition Risk Enhancement Assessment Model (SCREAM), to the Contractor at the start of the contract to support those aspects of the Contractor's QC. The Program Manager will provide two hours of instruction detailing how the tool is populated and used. The Contractor will address any issues identified by the QC tool before submitting deliverable to the Program Manager. The submittal shall also include the SCREAM QC results with each weekly submittal. Contractors QC activities will be discussed at project meetings. Failure to meet data requirements may result in a delay of payment.
2. CCTV and Sonar/TISCIT Data:
 - a. This data will be submitted weekly; The data will include in the file name, the name of the area assignment and the date of assessment for the last entry.
 - b. The data will not be consolidated with previous data submittals

- c. Prior to submitting the data, the Contractor will QC the databases, perform the Quality Control check from the SCREAM tool provided and copy the program manager with the SCREAM tool Quality Control results.
3. Data submittals will include a transmittal letter noting databases delivered in the submittal.

END OF SECTION

SECTION 01041
PROJECT COORDINATION

PART 1 – GENERAL

1.01 SECTION INCLUDES

The work under this Section includes the requirements of the Contractor to use standard methods of construction planning, coordination, inspection, scheduling and cost value documentation necessary for the proper and complete performance of the Work.

1.02 RELATED SECTIONS

This Section applies to the work of every division and every section of these Specifications.

1.03 QUALIFICATIONS AND REQUIREMENTS

- A. Management of the Project shall be through the use of standard methods suitable to the County of construction planning, inspection, scheduling and cost value documentation.

1.04 RESPONSIBILITY FOR COORDINATION

- A. Carefully coordinate work with all other contractors and/or subcontractors to ensure proper and adequate interface of the work of other trades and subcontractors with the work of every section of these Specifications.
- B. The Contractor shall coordinate operations with all utility companies in or adjacent to the area of Contractor's work. The Contractor shall require said utilities to identify in the field their property and provide drawings as necessary to locate them.
- C. The Contractor shall schedule the Contractor's Work so the Contractor does not interrupt the operation of any existing facility, including water mains and sewers. In the event certain tie-ins or other operations make it absolutely necessary to interrupt the operation of existing facilities, the Owner of such utility or facility will be notified and such work will be done at a time and in a manner acceptable to the County/Program Manager.
- D. The Contractor shall coordinate with all property owners and governing authorities impacted by the execution of work activities as to not prevent access or cause service interruptions to critical public institutions such as hospitals, schools, police and fire services, etc. and any other businesses deemed necessary for public welfare and safety. The Contractor shall notify the Program Manager in a timely manner of any related coordination efforts required prior to commencing work activities that may cause impacts. For off road work which includes land disturbance, even on an easement, the County requires that the Contractor notify the land owner of the property on which the Contractor intends to occupy and obtain a right-to-enter from that owner prior to beginning work. Failure to provide ample notification to the Owner's Representative will not justify claim for delays.
- E. The County owns and maintains a series of flow monitors and associated equipment throughout the sewer collection system. As such, the Contractor shall immediately

notify the Program Manager whenever the Contractor is no less than five (5) business days Work away from a manhole where flow monitoring equipment is installed. The Program Manager will work with the County to have the equipment removed prior to the Contractor performing any assessment or rehabilitation on the manhole or connecting sewer mains in which flow monitoring equipment is located. Upon successful completion of the Contractor's Work, the Contractor shall notify the Program Manager within twenty-four (24) hours to have the flow monitoring equipment properly re-installed and calibrated. Should the Contractor locate flow monitoring equipment in manholes or locations deviant from the proved locations, the Contractor shall immediately notify the Program Manager of the discrepancy and no Work shall be completed by the Contractor until the County is able to successfully remove the equipment to allow Work to continue.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

3.01 PREPARATION

A. Inspection

1. Prior to performing any work under a section, the Contractor shall carefully investigate and confirm existing conditions that could affect the Work as well as inspect the installed work of other trades and verify all such work is complete to the point where the work under the section may properly commence.
2. The Contractor shall verify all materials, equipment and products to be installed under a section may be installed in strict accordance with the original design and pertinent reviewed shop drawings and the workers are qualified to install such items.

B. Discrepancies

1. In the event of discrepancy, immediately notify the Program Manager.
2. Do not proceed with construction in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 REQUIREMENTS

- A. The Contractor shall coordinate the work with the County/Program Manager so the construction will not restrain or hinder the operation of existing water or wastewater facilities. If at any time, any portion of the water or wastewater facilities are scheduled to be out of service, the Contractor must obtain prior approval from the County as to the date, time, and length of time that such facilities are out of service.
- B. Connections to the existing facilities, temporary service interruptions and/or alteration of existing facilities will be made at times when the piping, asset, or facility involved is not in use, or at times, as established by the County, when the piping,

asset, or facility involved can be conveniently interrupted for the period needed to execute the work activity involved as established by the County/Program Manager.

- C. After having coordinated the work with the County/Program Manager, the Contractor shall notify the Program Manager of the time, time limits, and methods of each connection or alteration and have the approval of the Program Manager before any work is undertaken on the connections or alterations.
- D. Before any roadway or facilities are blocked off, the County's/Program Manager's approval shall be obtained to coordinate operations for water and wastewater facilities and assets, and any signage, plating, bypass pumping, sinking of bypass conduits, ramping, stream crossings, or any other temporary accommodation work shall be implemented by the Contractor as directed by the Program Manager.

3.03 PUBLIC NOTIFICATION

- A. Public notification is critical and compliance with the public notification criteria is a prerequisite for the Work, especially when performing Work on sewers in easements which pass through private properties. 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 Work, such as CCTV or Cleaning. Expedited Work may only require 24 hours notice before conducting Work upon approval by County. The Contractor shall distribute the door hangers to the property owners (residential, commercial and institutional) in the affected area(s). 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's commencement. The Contractor must notify Public Outreach before notification to the property owners. If the Work is delayed, the Contractor must re-distribute door hangers.
 - 2. The Contractor is responsible for utilizing the "Right of Entry" (ROE) Protocol as a guide to obtain the ROE and/or Permission form from property owners.
 - d. The Contractor is responsible for distributing pre-approved "Right-of-Entry" (ROE) forms if land disturbance will occur on the owner's property. Secured signatures from affected property owners on the ROE forms are needed prior to conducting Work activities.
 - e. The Contractor is responsible for distributing pre-approved Permission forms and securing signatures from affected property owners, if access is needed to an owner's property and no land disturbance will occur. The Permission form is needed prior to conducting Work.
 - f. The Contractor will utilize the ROE/Permission Form Cover letter to accompany both the ROE and/or Permission form.

- B. The Contractor shall keep a daily log of the distribution of the door hangers. This shall be maintained and submitted to the County and/or Program Manager upon request.
- C. The Contractor shall also utilize the Mobile Mapping tool to update the status of the distribution of door hangers, and the ROE and/or Permission form needed at a particular address.
- D. The Contractor shall alert the appropriate County, Program Manager and/or personnel of their work locations on a daily basis.
- E. The Contractor will provide and place “Right-of-Way” signs in prominent locations where the Work 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 at a minimum of 12 inches above grade by integral metal frames. Wording on the signs shall be similar to the following:

CLEANING AND/OR ASSESSMENT WILL BE CONDUCTED ON “date” and “time.” Contact “person” with “company” at “phone number” for additional information.

END OF SECTION

**SECTION 01045
CUTTING AND PATCHING**

PART 1 – GENERAL

1.01 SECTION INCLUDES

This section includes the Contractor's responsibility for all cutting, fitting, and patching, including excavation, backfill, surface restoration and all other aspects of the work that involves any interface between existing and new conditions required to complete the work or to:

- A. Complete new Work.
- B. Make several parts fit together properly.
- C. Uncover portions of the Work to provide for installation of ill-timed work.
- D. Remove and replace defective work.
- E. Remove and replace work not conforming to requirements of Contract Documents.
- F. Remove samples of installed work as specified for testing.

1.02 RELATED SECTIONS

- A. Section 01010: Summary of Work.
- B. Division 2 Specifications: Site Work.

1.03 SUBMITTALS

- A. Submit a written request/detailed description of proposed work to the Program Manager well in advance of executing any cutting or alteration affecting:
 - 1. Work of the County or any separated contractor.
 - 2. Structural value or integrity of any element of the Project.
 - 3. Integrity or effectiveness of weather exposed or moisture resistant elements or systems.
 - 4. Efficiency, operational life, maintenance or safety of operational elements.
 - 5. Visual qualities of sight exposed elements.
- B. Requests shall include:
 - 1. Identification of the Project.
 - 2. Description of the affected work.
 - 3. The necessity for cutting, alteration or excavation.

4. Effect on work of County or any separate contractor, or on structural or weatherproof integrity of Project.
 5. Description of proposed work:
 - a. Scope of cutting, patching, alteration, or excavation.
 - b. Trades/subcontractors who will execute the work.
 - c. Products proposed to be used including applicable data sheets.
 - d. Extent and method of refinishing to be done.
 - e. Plan to protect existing below and/or above grade structures, pipelines, etc.
 - f. Any other information required by the Program Manager.
 6. Alternatives to cutting and patching.
 7. Cost proposal, when applicable.
 8. Written permission of any separate contractor whose work will be affected.
- C. Submit written notice to Program Manager designating the date and the time the work will be uncovered.

PART 2 – PRODUCTS

2.01 MATERIALS

Comply with specifications, standards, and manufacturer's published instructions for each specific product involved. Materials shall comply with DWM standards.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Inspect and document existing conditions of Project, including elements subject to damage or to movement during cutting, patching, alteration or excavation work.
- B. After uncovering work, inspect conditions affecting installation of products, or performance of work.
- C. Report unsatisfactory or questionable conditions to Program Manager in writing. Do not proceed with work until Program Manager has approved further instructions.
- D. Provide all necessary and adequate devices and methods of temporary support and protection, as necessary, to assure structural and operational integrity or safety of any existing utility, facility or property affected by the Work. Obtain written approval of

all proposed methods of protection and support from impacted Owners before impacting property or implementing action.

- E. All damage or injury caused by Contractor's work or failure to adequately protect the property of others shall be repaired and corrected to the satisfaction of the applicable Owner, at no additional cost to the County.
- F. Provide and maintain protection from the elements all utilities, facilities or property potentially exposed by cutting, patching, alteration, or excavation Work, and maintain excavations free from water.
- G. Inspect, monitor and document conditions of all utilities, facilities or property subject to damage or to movement during all aspects of the cutting, patching, alteration, or excavation Work.

3.02 INSTALLATION

- A. Execute cutting and demolition by methods preventing damage to other work and will provide proper surfaces to receive installation of repair.
- B. Execute excavating and backfilling by methods required by these Specifications, preventing settlement or damage to other work or property.
- C. Employ only qualified, approved Installers or Fabricators to perform cutting and patching.
- D. Execute fitting and adjustment of products/materials to provide a finished installation complying with specified products, functions, tolerances, and finishes.
- E. Restore work cut or removed and install new products to provide completed work in accordance with the requirements of the Contract Documents.
 - 1. Typical Patching Detail: The Contractor is to perform pavement repairs associated with external point repairs in paved areas in accordance with DeKalb County DWM Standard Drawing #S-016 Typical Patch and Resurfacing. This Section may be modified to include the installation of dyed concrete for the Class "A" Concrete cap and raising the cap to the level of the roadway riding surface. This revision is subject to the approval of the Program Manager.
 - 2. Typical Backfill and Allowable Trench Width Detail: The Contractor is to perform pipe backfill associated with external point repairs in accordance with DeKalb County DWM Standard Drawing #S-018 Typical Backfill and Allowable Trench Width Detail.
 - 3. Typical Lateral Connection Detail: Where required the Contractor is to perform service line reconnections within external pipe repair assignments in accordance with DeKalb County DWM Standard Drawing #S-017 Sanitary Sewer Lateral Connection Detail
 - 4. See DeKalb County Department of Watershed Management *Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards*-latest edition for Standard Drawings.

- F. Fit work airtight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.
- G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
 - 1. For continuous surfaces, refinish to nearest intersection.
 - 2. For an assembly, refinish entire unit.

END OF SECTION

**SECTION 01056
GPS DATA COLLECTION**

PART 1 – GENERAL

1.01 WORK FOR THIS SECTION

- A. The purpose of this work is to establish the position of asset points and new work in the sanitary sewer collection system using the Global Positioning System (GPS); establish the minimum quality of data; and, specify how the data will be delivered. The GPS position will be established for newly identified sanitary sewer system assets and corrected in the event of existing incorrectly mapped assets. GPS position will also be gathered for locations as noted in all other Sections of these Specifications.

- B. GPS capture is required as described below.
 - 1. For all new assets located in the field or assets currently mapped incorrectly, Level 1 survey shall be performed. This includes all coordinates of all points X, Y & Z to the nearest 1 cm. When +/- 1 cm vertical/elevation relative accuracy tolerance is required RTK GPS. The relative horizontal and vertical accuracy shall conform to the 1 cm accuracy standard per NGS Guidelines .
 - 2. For all other assets not included in Level 1, Level 2 survey shall be performed. This includes all coordinates of all points X, Y & Z to the nearest 3 meters. When +/- 1 meter vertical/elevation relative accuracy tolerance is required RTK GPS. The relative horizontal and vertical accuracy shall conform to the 3 m accuracy standard.
 - 3. When GPS capture cannot be achieved on manholes, due to canopy or building interferences, the position will be obtained by conventional survey methods tied to the stated reference system or other applicable methods. at the accuracy listed above.

1.02 SUBMITTALS

- A. The Contractor shall provide to the Program Manager in writing the following information prior to the set deadline, or at the indicated frequency, whichever is applicable.

<u>Type of Submittal</u>	<u>Time/Frequency of Submittal</u>
Digital Data related to New Assets	Weekly
Digital Data and revisions related to Existing Assets	Weekly

1.03 RELATED SECTIONS

- A. The Work of the following Sections apply to the Work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of the Work.
 - 1. 01510: Sanitary Sewer Main Television & Sonar Inspection
 - 2. 02956: Sanitary Sewer Cleaning

1.04 EXPERIENCED WORKERS

- A. Supervisor of the field crews shall have received proper training in this function and have a minimum of three years' experience in performing such work including safe working practices, etc.
- B. Crew Leaders/Field Supervisors obtaining GPS data shall have received proper training in this function and have a minimum of one year's experience in performing such work including safe working practices, etc.
- C. The Contractor shall provide the Program Manager with written documentation indicating all Crew Leaders/Field Supervisors responsible for obtaining GPS data have received the proper training and, where required, the requisite experience.
- D. The Contractor shall provide a detailed account of satisfactory GPS experience during the last three years. Those references shall include contact, agency, telephone number and address.

1.05 REFERENCE COORDINATE SYSTEM

- A. The horizontal (X&Y) position of points will be referenced to the Georgia State Plane West NAD-83 coordinate system (NAD_1983_StatePlane_Georgia_West_FIPS_1002_Feet).

1.06 PROVIDED BY County/Program Manager

- A. A map of each area of work will be provided by the Program Manager from the County's existing GIS map. The map will contain, when available, streets with names, aerial imagery, sewer manholes with asset IDs and sewer lines with existing GIS information available.

1.07 CALIBRATION

- A. Calibration shall be carried out in accordance with the GPS equipment manufacturer's instructions. Additional calibrations may be required during the course of the working day for large fluctuations of temperature and/or humidity, also in accordance with the manufacturer's instructions and tolerances.

1.08 INTERFERENCE

- A. Contractor must obtain a GPS position of sanitary point structures regardless of the overhead conditions or other nearby obstructions interfering with satellite signals, at no additional cost. Coverage conditions will not allow all positions to be obtained by

setting directly over the point to be obtained. Contractor may use conventional surveying methods to obtain the position of the point.

PART 2 – PRODUCTS

(not used)

PART 3 – EXECUTION

3.01 GENERAL

- A. The Contractor shall furnish all labor, tools, materials, software and equipment necessary for capturing the position of all points specified.

3.02 PREPARATION

- A. Mission Planning: Contractor shall plan the collection of GPS data, using the appropriate software, to optimize the accuracy and speed of data collection while minimizing the impact and interference on traffic and other activities.

3.03 DATA

- A. The inventory database deliverable(s) for newly discovered assets or existing mapped assets with incorrect existing position shall be submitted as an ESRI Personal or File Geodatabase with each feature type represented in a different feature class (manholes, mains, etc.). Each attribute for manholes and mains is to be populated as provided in the attribute templates provided below. The data must be in the correct datum capable to be integrated into County’s ESRI ArcGIS system which is the County’s standard GIS software.
- B. Manholes Attributes Template

ID	Northing	Easting	Top of Cover Elevation	Depth	Material	Invert Elevation

- C. For assets with only incorrect coordinate location information but already located within the mapped inventory, only the corrected coordinates will be provided by the Contractor. Necessary data will be logged so that uncorrected positions can be post-processed and coordinated with DWM GIS division, at the discretion of the County and Program Manager, to obtain more accurate positions.
- D. For assessment activities, including CCTV, and any other activity described in these Specifications, coordinates will be gathered per the instruction procedures of each respective assessment Specification Section. The GPS data collection for these

activities as well as others should adhere to the coordinate system, accuracy level, and all additional procedures outlined in this Specification Section.

3.04 DELIVERABLES

- A. Map corrections to the printed map will be illustrated on the printed map with red markings and delivered at the completion of each week. Supplemental sketches will be provided, as necessary, to clearly depict the actual site conditions.
- B. Coordinate and attribute data will be provided in GIS digital format as described in these Specifications on a weekly basis or as directed by the Program Manager.

END OF SECTION

SECTION 01060
REGULATORY REQUIREMENTS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Contractors general responsibilities for adhering to all county, state, and federal regulatory divisions rules, regulations, and laws even when plans do not indicate required permitting actions required for the project.
- B. Permits and Responsibilities: The Contractor shall, without additional expense to the County, comply with any applicable federal, state, County and municipal laws, codes and regulations, in connection with the execution of the Work.
- C. The Contractor shall take proper safety and health precautions to protect the Work, the workers, the public and the property of others.
- D. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the Work, except for any completed unit of work thereof which may heretofore have been accepted.
- E. Business Licenses: The Contractor shall provide the County, on the proper form, proof of being licensed to do business within DeKalb County; proof of proper business licenses shall also be provided by the Contractor for any and all subcontractors coming under the jurisdiction of this Contract.

1.02 ROADWAY PERMITTING

- A. The Contractor is responsible for obtaining road opening permits from the DeKalb County Department of Public Works Transportation Division at (770)492-5222, including providing any required restoration bonds.
- B. The Contractor is responsible for supplying all data and/or supporting documentation to the County when the County is obtaining road opening permits or traffic interruption requests required by the GDOT. The Contractor is not permitted to make any type of cuts on roadways requiring a permit from the GDOT until such time as the permit is provided and prominently displayed on-site. All documents necessary for said application must be provided by the Contractor to the County and Program Manager. The Contractor is responsible for inputting schedule and other required information into the State's web-based system.
- C. Traffic control shall be in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), latest edition.

1.03 EPD stream buffer Permits Activities

- A. Buffers on state waters are valuable in protecting and conserving land and water resources, therefore buffers should be protected. The buffer variance process will apply to all projects legally eligible for variances and to all state waters having vegetation wrested from the channel by normal stream flow, provided adequate erosion control measures are incorporated in the project plans and specifications

and are implemented. The following activities do not require application to or approval from the Division:

1. stream crossings for water lines or stream crossing for sewer lines occurring at an angle, as measured from the point of crossing, within 25 degrees of perpendicular to the stream and cause a width of disturbance of not more than 50 feet within the buffer; or
2. where drainage structures must be constructed within the twenty-five (25) foot buffer area of any state water not classified as a trout stream; or
3. where roadway drainage structures must be constructed within the twenty-five (25) foot buffer area of any state waters or the fifty (50) foot buffer of any trout stream.

1.04 ACOE Permits for MISCELLANEOUS Activities

- A. Section 404 of the Clean Water Act requires all dredge and fill activities affecting the Nation's waters, including wetlands and other special aquatic sites to be permitted by a Nationwide Permit (NWP), Regional Permit, or Individual Permit, unless otherwise exempted.
- B. All Department of Army Corps of Engineers (ACOE) Permits shall be obtained by the County. The Contractor shall be responsible for complying with all required permits and shall perform restoration activities where temporary dewatering of areas is required.
- C. The ACOE has the authority to review project work within the Nation's water and to issue individual permits or approve the use of Nationwide and Regional Permits. The Environmental Protection Agency (EPA), Georgia Environmental Protection Division (EPD) and other natural resource agencies provide a key role in the review and establishing conditions of the permits.
- D. Work in jurisdictional waters, jurisdictional wetlands and bank stabilization activities shall not commence until all permits have been issued.
- E. Some NWPs require project proponents to notify ACOE district engineers prior to commencing NWP activities. These notifications are called pre-construction notifications (PCNs), and they provide district engineers with opportunities to confirm whether or not the proposed activities qualify for NWP authorization. For most NWPs, the district engineer has to respond to a notification within 45 days of receipt of a complete PCN (see General Condition 31). If, after reviewing the PCN, the district engineer determines the proposed activity qualifies for NWP authorization, the district engineer issues an NWP verification letter to the project proponent. The NWP verification may contain special conditions ensuring the NWP activity results in

minimal individual and cumulative effects on the aquatic environment and the Corps public interest review factors.

1.05 Quality Assurance

- A. Contractor shall perform all work under this Section in accordance with all pertinent Rules and regulations including, but not necessarily limited to, those stated herein and these Specifications, the more stringent provisions shall govern.
- B. The Contractor shall allow access to ACOE, EPA, EPD, and other enforcing personnel should they wish to visit the work sites. This includes assisting with transportation as may be required along easements, if necessary.

PART 2 – PRODUCTS

2.01 Materials

- A. Materials required to comply with these regulations shall include bank stabilization materials, materials for construction of temporary roads or crossings, sandbags and rebar for reconstruction of beaver dams, mats for temporary road access.
- B. Mats consist of wooden, rubber or metal structures capable of distributing the weight of heavy equipment to prevent soil displacement in wetland conditions.

PART 3 – EXECUTION

3.01 GENERAL

Provide all materials and promptly take actions necessary to achieve effective compliance with regulations in accordance with Section 404 of the Clean Water Act, the enforcing agency (ACOE), other enforcing personnel, and these Specifications.

3.02 EPD STREAM BUFFER PERMIT CONDITIONS

Variance applications will be reviewed by the Director only where the applicant provides reasonable evidence that impacts to the buffer have been avoided or minimized to the fullest extent practicable and only in the following cases:

- A. The project involves the construction or repair of a structure which, by its nature, must be located within the buffer. Such structures include dams, public water supply intake structures, detention/retention ponds, wastewater discharges, docks including access ways, boat launches including access ways, and stabilization of areas of public access to water; or
- B. The project will result in the restoration or enhancement to improve water quality and/or aquatic habitat quality; or
- C. Buffer intrusion is necessary to provide reasonable access to a property or properties; or
- D. The intrusion is for gravity-flow sewer lines that cannot reasonably be placed outside the buffer, and stream crossings and vegetative disturbance are minimized; or

- E. Crossing for utility lines, including but not limited to gas, liquid, power, telephone, and other pipelines, provided the number of crossings and the amount of vegetative disturbance are minimized; or
- F. Recreational foot trails and viewing areas, providing impacts to the buffer are minimal; or
- G. The project involves construction of one (1) single family home for residential use by the owner of the subject property and, at the time of adoption of this rule, there is no opportunity to develop the home under any reasonable design configuration unless a buffer variance is granted. Variances will be considered for such single-family homes only if construction is initiated or local government approval is obtained prior to the effective date of this rule; or
- H. For non-trout waters, the proposed land disturbing activity within the buffer will require a permit from the United States Army Corps of Engineers under Section 404 of the federal Water Pollution Control Act Amendment of 1972, 33 U.S.C. Section 1344, and the Corps of Engineers has approved a mitigation plan to be implemented as a condition of such a permit; or
- I. For non-trout waters, a plan is provided for buffer intrusion showing, even with the proposed land disturbing activity within the buffer, the completed project will result in maintained or improved water quality downstream of the project; or
- J. For non-trout waters, the project with a proposed land disturbing activity within the buffer is located in, or upstream and within ten linear miles of, a stream segment, or,
- K. Listed as impaired under Section 303(d) of the federal Water Pollution Control Act Amendment of 1972, 33 U.S.C. Section 1313(d) and a plan is provided showing the completed project will result in maintained or improved water quality in such listed stream segment and the project has no adverse impact relative to the pollutants of concern in such stream segment; or
- L. For non-trout waters, the proposed land disturbing activity within the buffer is not eligible for a permit from the United States Army Corps of Engineers under Section 404 of the federal Water Pollution Control Act Amendment of 1972, 33 U.S.C. Section 1344, includes required mitigation in accordance with current EPD “Stream Buffer Variance Mitigation Guidance” document, and involves:
 - 1. piping, filling, or re-routing of non-jurisdictional Waters of the U.S.; or
 - 2. stream buffer impacts due to new infrastructure projects adjacent to state waters (jurisdictional and non-jurisdictional Waters of the U.S.). This criterion shall not apply to maintenance and/or modification to existing infrastructure, which are covered under 391-3-7.05(2)(a).
 - 3. If the buffer impact will be temporary, the buffer variance request shall include the following information at a minimum:
 - a. A site map including locations of all state waters, wetlands, floodplain boundaries and other natural features, as determined by field survey.
 - b. A description of the shape, size, topography, slope, soils, vegetation and other physical characteristics of the property.

- c. A dated and numbered detailed site plan showing the locations of all structures, impervious surfaces, and the boundaries of the area of soil disturbance, both inside and outside of the buffer. The exact area of the buffer to be impacted shall be accurately and clearly indicated.
 - d. A description of the project, with details of the buffer disturbance, including estimated length of time for the disturbance and justification for why the disturbance is necessary.
 - e. A calculation of the total area and length of buffer disturbance.
 - f. A letter from the issuing authority (if other than the Division and as applicable) stating it is aware of the project.
 - g. An erosion, sedimentation and pollution control plan, where applicable.
 - h. Proposed mitigation, if any, for the buffer disturbance and a restoration and re-vegetation plan, if applicable.
 - i. Any other reasonable information related to the project the Division may deem necessary to effectively evaluate the variance request. Division shall determine if this information is needed within 20 business days of receipt.
 - j. Application shall be on forms provided by the Division.
4. If the buffer impact will be permanent, the buffer variance request shall include all of the information in Sections (3)(a) thru (j) above, with the exception of (3)(h). A buffer variance request with permanent impact shall also include the following additional information:
- a. For non-trout waters, a copy of the permit application, supporting documentation, and proposed mitigation plan, if applicable, as submitted to the United States Army Corps of Engineers under Section 404 of the federal Water Pollution Control Act Amendment of 1972, 33 U.S.C. Section 1344, if applicable.
 - b. A buffer mitigation plan addressing impacts to critical buffer functions, including water quality, floodplain, watershed and ecological functions based on an evaluation of existing buffer conditions and predicted post construction buffer conditions pursuant to Section (7)(c) herein.
 - c. A plan for stormwater control once site stabilization is achieved, where applicable.
 - d. For variance requests made under Sections (2)(i) and (2)(j), the application shall include the following water quality information:
 - i. For variance requests under Section (2)(i), the application must include documentation that post-development conditions of the project will meet the four primary (water quality, downstream channel protection, overbank flood protection, and extreme flood protection) performance requirements in the Georgia Stormwater Management Manual or the equivalent.
 - ii. If the proposed variance is in, or within 10 linear miles of and upstream of, a stream segment listed as impaired under Section 303(d) of the federal Water Pollution Control Act Amendment of 1972, 33 U.S.C. Section 1313(d), the application must include predicted pollutant loading under

pre- and post-development conditions as estimated by models accepted by the Division. In addition, the applicant must document how the proposed project is in compliance with the TMDL implementation plan, if available, as required in Subsection 391-3-7-.05(5)(i).

5. Upon receipt of a completed application in accordance with Sections 391-3-7-.05(3) or 391-3-7-.05(4), the Division shall consider the completed application and the following factors in determining whether to issue a variance:
 - a. The shape, size, topography, slope, soils, vegetation and other physical characteristics of the property; and
 - b. The locations of all state waters on the property as determined from field inspection; and
 - c. The location and extent of buffer intrusion; and
 - d. Whether reasonable alternative project designs, such as the use of retaining walls, are possible which do not require buffer intrusion or which require less buffer intrusion; and
 - e. Where the buffer impact is temporary, the buffer restoration plan is low or no maintenance, and the plan provides net gain in buffer value/function (i.e. water quality, floodplain, watershed, ecological perspectives), the application will be approved unless the Director declines the application based on the exceptional existing buffer value/function; and
 - f. Whether issuance of the variance is at least as protective of natural resources and the environment, and including wildlife habitat; and
 - g. The current condition of the existing buffer, to be determined by:
 - i. The extent the existing buffer vegetation is disturbed;
 - ii. The hydrologic function of the buffer;
 - iii. Stream characteristics such as bank vegetative cover, bank stability, prior channel alteration, or sediment deposition; and
 - h. The extent the encroachment into the buffer may reasonably impair buffer functions.
 - i. The value of mitigation activities conducted pursuant to this rule, particularly Subsections 391-3-7-.05(7)(c) and 391-3-7-.05(7)(d) herein, and shall take regional differences into consideration on-site or downstream, to be determined by development techniques or other measures contributing to the maintenance or improvement of water quality, including the use of low impact designs and integrated best management practices, and reduction in effective impervious surface area; and
6. The long-term water quality impacts of the proposed variance, as well as the construction impacts. For applications made under Subsections 391-3-7.05(2)(i) or 391-3-7-.05(2)(j), the following criteria, reflecting regional differences in the state, shall be used by the Director to assist in determining whether the project seeking a variance will, when completed and with approved mitigation, result in maintained or improved water quality downstream of the project and minimal net impact to the buffer:

- a. Division will assume the existing water quality conditions are commensurate with an undeveloped forested watershed unless the applicant provides documentation to the contrary. If the applicant chooses to provide baseline documentation, site and/or stream reach specific water quality, habitat, and/or biological data would be needed to document existing conditions. If additional data are needed to document existing conditions, the applicant may need to submit a monitoring plan and have it approved by the Division prior to collecting any monitoring data. Existing local data may be used, if available and of acceptable quality to the Division.
 - b. The results of the predicted pollutant loading under pre- and post-development conditions as estimated by models accepted by the Division indicate existing water quality conditions will be maintained or improved.
 - c. Projects for which a land disturbing activity is proposed within the buffer of a 303(d) listed stream, or upstream and within 10 linear miles of a 303(d) listed stream, the results of the model demonstrate the project has no adverse impact relative to the pollutants of concern in such stream segment.
7. Within 60 days of receipt of a complete buffer variance application, the Division will either provide written comments to the applicant or propose to issue a variance. When the Division proposes to issue a variance, it will send out a public advisory to all citizens and groups who request to receive the advisories. The applicant will then publish a notice in the legal organ of the local jurisdiction. The public advisory and public notice shall describe the proposed buffer modification, the location of the variance, where the public can go to review site plans, and where comments should be sent. The public shall have 30 days from the date of publication of the notice in the legal organ to comment on a variance proposal.
8. In all cases in which a buffer variance is issued, the following conditions shall apply:
- a. The variance shall be the minimum reduction in buffer width necessary to provide relief. Streams shall not be piped if a buffer width reduction is sufficient to provide relief.
 - b. Disturbance of existing buffer vegetation shall be minimized.
 - c. Required mitigation shall offset the buffer encroachment and any loss of buffer functions. Where lost functions cannot be replaced, mitigation shall provide other buffer functions that are beneficial. Buffer functions include, but are not limited to:
 - i. temperature control (shading);
 - ii. streambank stabilization;
 - iii. trapping of sediments, if any;
 - iv. removal of nutrients, heavy metals, pesticides and other pollutants;
 - v. aquatic habitat and food chain;
 - vi. terrestrial habitat, food chain and migration corridor; and
 - vii. buffering of flood flows.

- d. Mitigation should be on-site when possible. Depending on site conditions, acceptable forms of mitigation may include but are not limited to:
 - i. Restoration of the buffer to a naturally vegetated state;
 - ii. Bioengineering of channels to reduce bank erosion and improve habitat;
 - iii. Creation or restoration of wetlands;
 - iv. Stormwater management to better maintain the pre-development flow regime (with consideration given to downstream effects) that exceeds the requirements of applicable ordinances at the time of application;
 - v. Reduction in pollution sources, such as on-site water quality treatment or improving the level of treatment of septic systems;
 - vi. Other forms of mitigation that protects or improves water quality and/or aquatic wildlife habitat;
 - vii. An increase in buffer width elsewhere on the property;
 - viii. Mitigation required under a Clean Water Act Section 404 or Nationwide permit issued by the U.S. Army Corps of Engineers;
 - ix. Those described in the most recent publication of the Georgia Stormwater Management Manual.
 - e. Forms of mitigation which are *not* acceptable include:
 - i. Activities already required by the Georgia Erosion and Sedimentation Act, such as the minimal use of best management practices;
 - ii. Activities, already required by other federal, state and local laws, except as described in 391-3-7.05(7)(d) above. Corps of Engineers mitigation is acceptable.
 - f. The Division will not place a condition on a variance requiring a landowner to deed property or the development rights of property to the state or to any other entity. The landowner may voluntarily preserve property or the development rights of property as a mitigation option with the agreement of the Division.
9. If a variance issued by the Director is acceptable to the issuing authority, the variance shall be included as a condition of permitting and therefore, becomes a part of the permit for the proposed land disturbing activity project. If a stream buffer variance is not acceptable to the issuing authority, the issuing authority may issue a land disturbing permit without allowing encroachment into the buffer.
10. A general variance is provided for piping of trout streams with an average annual flow of 25 gpm or less.
11. To obtain this general variance in Section 391-3-7.05(9) for encroaching on the buffer of a trout stream, the applicant must submit information to the issuing authority or EPD if there is no issuing authority demonstrating that the average annual flow in the stream is 25 gpm or less. There are two acceptable methods for making this determination.

- a. The USGS unit area runoff map may be used to determine the threshold acreage producing an average annual flow of 25 gpm or less.
 - b. The applicant may submit a hydrologic analysis certified by a Registered Professional Engineer or Geologist presenting information sufficient to estimate the average annual flow of each stream to be piped is 25 gpm or less with a high level of certainty.
12. Any stream piping performed in accordance with this general variance in Section 391-3-7.05(9) shall be subject to the following terms:
- a. The total length of stream piped in any one property shall not exceed 200 feet.
 - b. Any project involving more than 200 ft. of piping will require an individual variance for the entire project. The general variance may not be applied to a portion of a project, e.g., it is not permissible to pipe 200 ft. of a stream under the general variance and seek an individual variance for an additional length of pipe.
 - c. The downstream end of the pipe shall terminate at least 25 ft. before the property boundary.
 - d. The applicant for a Land Disturbing Activity Permit shall notify the appropriate issuing authority of the precise location and extent of all streams piping as part of the land disturbing activity permit application. The issuing authority (if other than the Division) shall compile this information and convey it to the Division annually.
 - e. Where piping of a stream increases the velocity of stream flow at the downstream end of the pipe, appropriate controls shall be employed to reduce flow velocity to the predevelopment level. Plans for such controls must be submitted as part of the land disturbing activity permit.

3.03 ACOE PERMIT CONDITIONS

- A. General: NWP including, but not limited to, 3, 13, 14, and 33 apply to activities anticipated on this project. Each permit contains specific criteria that must be satisfied to be in compliance with the permit. In addition, 15 general permit conditions cover all Nationwide Permits. Both specific criteria and general permit conditions are applicable to this project.
- B. NWP 3 (Maintenance)
 - 1. Application: For all serviceable structures of fill requiring rehabilitation and/or replacement, including raising manholes.
 - 2. Permit Conditions: Use best management practices such as construction mats, proper erosion and sedimentation control and high-flotation tires on heavy equipment.
- C. NWP 13 (Bank Stabilization)
 - 1. Application: For all rehabilitation/replacement activities along stream banks and other areas.
 - 2. Permit Conditions:

- a. No material is placed in excess of the minimum needed for erosion protection.
- b. The bank stabilization activity is less than 500 feet in length without approval by the ACOE.
- c. The activity will not exceed an average of 1 cubic yard per running foot placed along the bank below the plane of the ordinary high water mark or the high tide line.
- d. No material is placed in any special aquatic site, including wetlands.
- e. No material is of the type, or is placed in any location, or in any manner, so as to impair surface water flow into or out of any wetland area.
- f. No material is placed in a manner to be eroded by normal or expected high flows.

D. NWP 14 (Road Crossings)

- 1. Application: For all rehabilitation/replacement activities requiring road crossings of wetlands and streams.
- 2. Permit Conditions
 - a. The width of fill is limited to the minimum necessary for the actual crossing.
 - b. The crossing is culverted, bridged, or otherwise designed to prevent the restriction of, and to withstand, expected high flows, and to prevent the restriction of low flows and the movement of aquatic organisms. The width of the fill is limited to the minimum necessary for the actual crossing.
 - c. The fill placed in the waters of the United States is limited to a filled area of no more than 1/3 acre. Furthermore, no more than a total of 200 linear feet of the fill for the roadway can occur in special aquatic sites, including wetlands.
 - d. The crossing, including all attendance features, both temporary and permanent, is part of a single and complete project for crossing a water of the United States.

E. NWP 33 (Temporary Construction, Access and Dewatering)

- 1. Application: For temporary dewatering and access road construction activities.
- 2. Permit Conditions
 - a. Temporary fill must be entirely removed to upland areas, or dredged material returned to its original location, following completion of the construction activity, and the affected areas must be returned to pre-construction conditions.
 - b. Cofferdams or other structures cannot be used to dewater wetlands or other aquatic sites so as to change their use.
 - c. The permittee has notified the ACOE District Engineer prior to use of this permit. The notification must include a restoration plan.

3.04 Restoration

- A. All wetland areas, streams, creeks and other areas containing bodies of water shall be restored as specified below:
1. Beaver Dam Removal and Replacement: The approved permitted activity may include breaching of a beaver dam at locations provided in the permit application. The location of the prescribed breach must not be changed without prior coordination with the Construction Manager or appointed liaison. Explosives are prohibited for beaver dam removal. If beaver dams are required to be breached, all beaver dams removed shall be restored as specified herein.
 - a. Restoration shall be done with sandbags filled $\frac{3}{4}$ full with materials from the site; preferably sandy soils.
 - b. Sandbags shall be placed in a staggered fashion to prevent a common seam from developing.
 - c. Number 4 steel reinforcement bar shall be used to fortify sandbag dams.
 - d. Reinforcement bar shall be driven a minimum of 2 feet below substrate and spaced per construction detail.
 - e. Bottom row of sandbags shall be embedded a minimum of 6 inches below ground surface, or until resting on compacted substrate, whichever is deeper.
 - f. Top elevation of sandbags should be determined by surveying the water elevation prior to removal of the dam.
 - g. All excavation and fill activities should be conducted by non-mechanical means. Bobcat-type tractors may be used to transfer construction supplies.
 - h. Dam shall be designed to allow flow over its middle section with the downstream channel lined with a row of sandbags.
 - i. Quality Assurance: After construction, the restored dam will be inspected by the Program Manager or an appointed liaison to ensuring the proper restoration techniques were employed. Afterwards, the beaver dam will be monitored for one growing season to ensure success. The Contractor will be responsible for reconstruction of any failed dam.
 2. Temporary Access Roads and Crossings
 - a. Must comply with any applicable permits.
 - b. Temporary construction roads may be constructed by earthen fill or crushed rock, or a combination of the two for wetland or stream crossings.

- c. Temporary construction roads for stream crossings must be constructed with materials able to withstand expected high flows.
 - d. Prior to placing fill within a wetland or stream, filter fabric should be placed beneath the fill area. The fabric will facilitate removal of the temporary fill materials.
 - e. All materials placed in a wetland or stream must be removed to an upland area following construction.
 - f. If culverts are required for a crossing, they must be designed to withstand and to prevent the restriction of expected high flows, and also to prevent the restriction of low flows and movement of aquatic organisms. Culverts must be removed and stream banks stabilized following the construction.
- B. Existing stream banks and buffers surrounding bodies of water must be restored to at least existing conditions status with the exception of cleared easements and access for sanitary sewer asset inspection, operation and maintenance.

END OF SECTION

SECTION 01070
ABBREVIATIONS AND SYMBOLS

PART 1 – GENERAL

1.01 SECTION INCLUDES

This section includes a list of applicable abbreviations for terminology, technical societies, organizations, and bodies relevant to the work. Whenever reference is made to the furnishing of materials or testing thereof to conform to the standards of any technical society, organization, or body, it shall be construed to mean the latest standard, code, specification or tentative specification adopted and published at the time of advertisement. Such standards are made a part hereof to the extent which is indicated or intended.

1.02 DEFINITIONS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACOE	Army Corps of Engineers
ACPA	American Concrete Pipe Association
AI	Asphalt Institute
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APA	American Plywood Association
APHA	American Public Health Association
APWA	American Public Works Association
ARC	Atlanta Regional Commission
AREA	American Railway Engineering Association
ASA	American Standards Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials

AWWA	American Water Works Association
BMP	Best Management Practice
CCTV	Closed Circuit Television
CD	Consent Decree
CERP	Contingency and Emergency Response Program
CFR	Code of Federal Regulations
CIPP	Cured-In Place Pipe
CMMS	Computerized Maintenance Management System
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
dB	Decibel
DIP	Ductile Iron Pipe
DIPRA	Ductile Iron Pipe Research Association
DT	Dye Testing
DVD	Digital Video Disc
DWM	DeKalb County Department of Watershed Management
EAP	Emergency Action Plan
EDA	Economic Development Administration
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
EPD	Georgia Environmental Protection Division
ESRI	Environmental Systems Research Institute
FCC	Federal Communications Commission
FHWA	Federal Highway Administration
FS	Federal Specifications
GA-DOA	Georgia Department of Agriculture
GDOT	Georgia Department of Transportation

GFCI	Ground Fault Circuit Interrupters
GIS	Geographic Information System
GPM	Gallons per Minute
GPS	Global Positioning System
GSWCC	Georgia Soil and Water Conservation Commission
HD	Hard Drive
HDD	Horizontal Directional Drilling
HDPE	High Density Polyethylene
HECP	Hydraulic Erosion Control Products
ICRI	International Concrete Repair Institute
I/I	Infiltration and Inflow
IPBA	International Pipe Bursting Association
JSA	Job Safety Analyses
LACP	Lateral Assessment and Certification Program
LF	Linear Foot
LSBE	Local Small Business Enterprise
MACP	Manhole Assessment and Certification Program
MARTA	Metropolitan Atlanta Rapid Transit Authority
MBMA	Metal Building Manufacturers Association
MSS	Manufacturers Standardization Society of the Valve and Fitting Industry
MUTCD	Manual on Uniform Traffic Control Devices
NACE	National Association of Corrosion Engineers
NAD	North American Datum
NASSCO	National Association of Sewer Service Companies
NBS	National Bureau of Standards
NCPI	National Clay Pipe Institute
NEC	National Electric Code

NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NGS	National Geodetic Survey
NPDES	National Pollutant Discharge Elimination System
NRMA	National Ready-Mix Association
NTP	Notice to Proceed
NWP	Army Corps of Engineers Nationwide Permit
OSARP	Ongoing Sewer Assessment and Rehabilitation Program
OSHA	Occupational Safety and Health Administration
PACP	Pipeline Assessment & Certification Program
PASARP	Priority Areas Sewer Assessment and Rehabilitation Program
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PCN	Army Corps of Engineers Preconstruction Notification
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride Pipe
PSA	Project Safety Coordinator
QA/QC	Quality Assurance / Quality Control
RCRA	Resource Conservation and Recovery Act
RECP	Rolled Erosion Control Products
RFI	Request for Information
RTK	Real Time Kinematic
SBC	Southern Building Code
SDS	Safety Data Sheet
SOP	Standard Operating Procedures
SSO	Sanitary Sewer Overflow
SSPC	Steel Structures Painting Council

ST	Smoke Testing
TAI	The Asphalt Institute
TCM	Traffic Control Manager
TISCIT	Totally Integrated Sonar and CCTV Inspection Technique
TMDL	Total Maximum Daily Load
TWIC	Transportation Worker Identification Credential
UBC	Uniform Building Code
UL	Underwriters Laboratories
USC	United States Code
USDC	United States Department of Commerce
USDOT	United States Department of Transportation
USGS	United States Geological Survey
WCTS	Wastewater Collection and Transmission System
WPCF	Water Pollution Control Federation

END OF SECTION

SECTION 01200
PROJECT MEETINGS

PART 1 – GENERAL

1.01 SECTION INCLUDES

This section includes general requirements for project-related meetings with the County and Program Manager required throughout the project life cycle including, but not limited to: pre-construction meetings, progress meetings, pre-installation meetings, and inspection tours.

1.02 RELATED SECTIONS

- A. Section 01010: Summary of Work
- B. Section 01300: Submittals

1.03 RESPONSIBILITY

- A. The Program Manager will determine the agenda for and chair the meetings described below; and also shall prescribe the documentation and format of that documentation for the meetings to be presented. The Contractor will furnish information needed by the Program Manager when requested.
- B. Periodic progress meetings and specially called progress meetings throughout the progress of the Work shall be held at times to be determined by the Program Manager, but at least on a monthly basis.
- C. The Contractor shall have the following specific responsibilities:
- D. Assist the Program Manager by providing information needed for the meeting
 - 1. Comment on, recommend items for discussion, and/or approve the proposed meeting agenda
 - 2. Provide appropriate personnel at the meeting to discuss items associated with the agenda
 - 3. Review, comment on and/or approve minutes of the meeting

- E. Representatives of contractors, subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.
- F. The County/Program Manager shall attend progress meetings to ascertain the work is expedited consistent with the Contract Documents and the project schedules.

1.04 KICK-OFF MEETING

- A. The Program Manager will schedule this meeting within 5 days of the issuance of the Notice to Proceed.
- B. The location of the meeting will be designated by the Program Manager.
- C. The following parties shall attend the meeting:
 - 1. County
 - 2. Program Manager
 - 3. Contractor's Superintendent and/or Representative
 - 4. Subcontractors as appropriate to the agenda
 - 5. Other agency representatives (EPD, EPA, DWM, etc.) as appropriate to the agenda
 - 6. Representatives of suppliers and manufacturers as appropriate to the agenda
 - 7. Others as requested by the County or Contractor
- D. Suggested Agenda:
 - Distribution and discussion of:
 - 1. List of major subcontractors and suppliers
 - 2. Projected Project Schedules (includes 2-week look ahead schedule for crews and schedule for newly assigned areas)
 - 3. Critical work sequencing (includes report of site conditions and associated needs associated with field review of new assignments as well as conditions effecting current work)
 - 4. Major equipment deliveries and priorities
 - 5. Data QA/QC
 - 6. Project Coordination (includes the need for permitting and Community Outreach assistance)
 - 7. Designation of responsible personnel
 - 8. Procedures and processing of:
 - a. Field decisions
 - b. Proposal requests
 - c. Submittals
 - d. WCD/Field Orders/Change Orders
 - e. Applications for Payment
 - 9. Adequacy of distribution of Contract Documents
 - 10. Procedures for maintaining Record Documents
 - 11. Temporary utilities

12. Safety and first aid procedures
13. Security procedures

1.05 PROGRESS MEETINGS

- A. Scheduling: Meetings shall be conducted at least bi-weekly throughout the assessment/construction phase or at other intervals directed by the Program Manager. Meeting frequency may be reduced at the request of the Program Manager.
- B. Location of the meetings: DeKalb Watershed Management office or other location designated by the Program Manager.
- C. Attendance:
 1. County/User group representative(s), as appropriate
 2. Program Manager's representative (at its option)
 3. Resident Project Representative
 4. Contractor's Program Manager, Superintendent, and Data Manager are required to attend. Other representative(s) will be required to attend as appropriate. If key personnel from the Contractor are not present, the County Manager reserves the right to call additional meetings to address this issue.
 5. Subcontractors and suppliers as appropriate to the agenda
 6. Others as appropriate
- D. Suggested minimum agenda:
 1. Review and approval of minutes of previous meeting
 2. Actual vs. scheduled progress since previous meeting
 3. Planned activities for the next two weeks
 4. Problems with and revisions to schedule
 5. Corrective measures and procedures to regain projected schedule
 6. Contract and/or Record Document clarifications
 7. Field observations, problems, and conflicts
 8. Quality control
 9. Actual and potential changes and their impacts
 10. Review proposed changes for:
 - a. Effect on Schedule and on completion date.
 - b. Effect on other components of the Project.
 11. Safety issues

1.06 INSPECTION TOURS

- A. Formal inspection tours shall be made of the job progress for the County and any other officials as the occasion warrants and as scheduled by the Program Manager.
- B. If requested by the Program Manager, the Contractor shall be prepared to show and explain work completed and in progress throughout the Project to the inspection parties.

PART 2 – PRODUCTS

(not used)

PART 3 – EXECUTION

(not used)

END OF SECTION

SECTION 01300
SUBMITTALS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Provisions in this Section and the applicable General Requirements are mandatory procedures for preparing and submitting equipment data sheets, shop drawings, product data, samples, assessment reports, procedures, schedules, certifications or any other submittals to be prepared and submitted as required of the Contract Documents or as directed by the Program Manager.
- B. Submissions shall be in orderly sequence and timed to cause no delay in the Work.
- C. Delays occasioned by requirement of submissions of any required submittal data not in accordance with Contract Documents are Contractor's responsibility and will not be considered valid justification for extension of Contract Time.
- D. Project delays or delays in the purchasing of materials or equipment occasioned by the requirement for resubmission of submittal data initially rejected by the Program Manager and/or the County, or are not originally in accordance with the Contract Documents upon review by the Program Manager and/or County, are the Contractor's sole responsibility and will not be considered valid justification for time extensions.
- E. No portion of the Work requiring the review of submittal data shall commence until each such submittal has been reviewed by the Program Manager and/or County, and the action required on the returned submittal does not require a correction and resubmittal (i.e., "Reviewed" or "Revise and Resubmit," or similar notation); and further, each supplier/fabricator/manufacturer and installer shall have possession of such final reviewed submittal prior to commencing its portion of the Work. Work commenced without compliance with the above will be subject to rejection and immediate removal and replacement at no additional cost to the County.
- F. At the time of submission the Contractor shall clearly delineate any deviations in the submittals or samples from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to the Program Manager for review and approval. Each such variation or deviation shall be clearly and decisively delineated, in detail so they are obvious to the reviewer. The Program Manager's review and approval of any variations or deviations shall not relieve Contractor from responsibility for any variation or deviation from the requirements of the Contract Documents unless Contractor has complied with the requirements of the Contract, and Owner's Representative has given written approval of each such variation or deviation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. If the deviations are deemed acceptable, suitable action may be taken for proper adjustment. Otherwise, the Contractor will not be relieved of the responsibility

for executing the work in accordance with the drawings and specifications even though such shop drawings have been reviewed by the Program Manager.

1.02 DEFINITIONS

- A. Samples: Physical examples prepared to illustrate materials, equipment or workmanship and to establish standards by which work will be judged as complying with contract requirements. Samples of trench materials submitted for acceptance testing shall be provided and will be used for comparison purposes of actual materials provided.
- B. Shop drawings: Drawings, diagrams, illustrations, schedules and performance charts, prepared to illustrate a portion of work in detail.
- C. Product data: Dated, printed literature of a product manufacturer which describes product and installation procedures.
- D. Submittals: General term including samples, shop drawings and product data, as applicable.
- E. Certificate of Conformance or Compliance: A document certified by a competent authority that the supplied good or service meets the required specifications. Also called certificate of compliance.
- F. Action Submittal: A submittal requiring Owner/Owner's Representative approval prior to commencing Work or ordering of applicable products and/or materials.
- G. Informational Submittal: A submittal submitted for informational purposes only. No Owner/Owner's representative approval is required. Submittal to be in conformance with the Contract Documents.

1.03 RELATED SECTIONS

- A. SECTION 01015 - CONTROL OF WORK

PART 2 – PRODUCTS

(not used)

PART 3 – EXECUTION

3.01 SUBMITTAL REQUIREMENTS

- A. Within 2 weeks of receiving the Notice-To-Proceed, the Contractor shall submit to the County, a complete schedule of submittals and submittal log for review and approval. The Contractor shall submit either Action or Informational submittals on a timely basis as indicated in the schedule to not delay the Work. Such data shall be in

sufficient detail to enable the County to identify the particular project and to form an opinion as to its conformity to the Specifications.

- B. Provide to the Program Manager as stipulated in individual work activities Specification.
- C. Submittals shall be digitally submitted in PDF format in color with all pages legible when reprinted on 8.5" x 11" paper.
- D. Each submission must be accompanied by a consecutively numbered letter of transmittal, listing the contents of the submission and identifying each item by reference to Specification Section or Drawing number. The Submittal shall contain a Submittal Identification Number.
- E. Submittals shall contain:
 - 1. The date of submission and the dates of any previous submissions.
 - 2. The Project title and the County's Project Number.
 - 3. Contract identification.
 - 4. The names of Contractor, Supplier, and Manufacturer, as applicable.
 - 5. Identification of the submittal/product, with the Specification Section number.
 - 6. Field dimensions clearly identified as such.
 - 7. Relation to adjacent or critical features of the work or materials.
 - 8. Applicable standards, such as ASTM or Federal Specification numbers.
 - 9. Identification of deviations from Contract Documents.
 - 10. Identification of revisions on re-submittals.
 - 11. An 8 inch by 3 inch blank space for Contractor and Program Manager stamp.
 - 12. Contractor's stamp shall be initialed or signed, certifying approval of the submittal and to the coordination of the information within the submittal with the requirements of the work and of Contract Documents.
- F. Shop drawings shall be accompanied by all required certifications and other such supporting materials, and shall be submitted in such sequence or in such groups so all related items may be reviewed together. When shop drawings cannot be reviewed because the submission is not complete, or because related shop drawings or items have not been received, such shop drawings will be returned without action or will be held until the lacking materials are received. Any delay to the project resulting from the submission of incomplete shop drawing data shall be the responsibility of the Contractor and shall not constitute grounds for a project time extension.
- G. Other special requirements may be listed in the Technical Specifications and/or given to the Contractor by the Program Manager. The Contractor shall provide such information or meet such requirements at no additional cost to the Owner.

3.02 SAMPLE PREPARATION

- A. Provide six (2) copies of submittals to the Owner' Representative.
- B. Prepare samples in sizes, shapes and finishes in accord with provisions of individual specification sections.

- C. Samples furnished under this section are not to be confused with full-size, on-the-site “Mock-Ups” called for in some specification sections.
- D. Unless otherwise indicated, the number of samples submitted shall be the number required by contractor, plus two to be retained by Owner’ Representative.
- E. The Contractor shall submit four samples, with tags and properly identified, for each item requiring samples.

3.03 SHOP DRAWING PREPARATION

- A. Shop drawing submittals shall comply with the following:
 - 1. Number sheets consecutively.
 - 2. Indicate working and erection dimensions and relationships to adjacent work.
 - 3. Show sectional views, where applicable.
 - 4. Indicate material, gauges, thicknesses, finishes, and characteristics compliance required by the Contract.
 - 5. Indicate anchoring and fastening details, including information for making connections to adjacent work.
- B. Form: Submit one (1) original drawing of full size to scale and two (2) copies. Digital submissions will be in AutoCAD 2000 format and PDF format including submittal forms and submit one (1) single PDF.
- C. Shop drawings shall be provided for any portion of the Work that would necessitate the need for such detailed plans as may be required for the material/product review or prosecution of the work, whether or not included in the Drawings. All necessary shop drawings shall be furnished by and through the Contractor. They shall include layout, plan and profile, shop details, erection plans, and bending diagrams for reinforcing steel, etc. Review by the Owner’s Representative must be obtained before any work involving these plans may be performed. Plans for other aspects of the work may also be required, and such cases shall be subject to review by the Owner’s Representative.

3.04 PRODUCT DATA PREPARATION

- A. Include product manufacturer’s dated, printed material with product description, storage and handling instructions and installation instructions indicated. Data not related to project shall be deleted. Storage and handling instructions shall be approved and on site before materials are shipped.

3.05 CONTRACTOR'S REVIEW

- A. Review all submittals before forwarding to the Program Manager and stamp to indicate conformance with requirements of the Contract Documents.
- B. Determine and verify field measurements and construction, materials, catalog numbers and similar data. Coordinate each submittal with requirements of work and Contract Documents.
- C. Where work is indicated "By Others", Contractor shall indicate subcontractor responsibility for providing and coordinating such work.
- D. Contractor agrees the submittals processed by the Program Manager are not Change Orders, the purpose of submittals by Contractor is to demonstrate the Contractor understands design concept, he demonstrates his understanding by indicating materials he intends to furnish and install, and by detailing fabrication, assembly, and installation methods he intends to use.
- E. Contractor represents, by submitting samples, shop drawings, and product data he has complied with provisions specified above. Submissions made without Contractor's approval indicated thereon will be returned without being reviewed for compliance with this requirement.
- F. Date each submittal and indicate name of Project, Program Manager, Contractor and Subcontractor, as applicable, description or name of equipment, material, or product and location where material or product is to be used.
- G. Accompany submittal with transmittal letter containing project name, Contractor's name, number of submittals, titles and other pertinent data. Transmittal shall outline variations or deviations, if any, in submittals from requirements of Contract Documents.

3.06 PROGRAM MANAGER'S REVIEW

- A. Program Manager will review submittals within 10 working days.
- B. Program Manager's review is only to determine general conformance with design concept of project and with information in Contract Documents. Program Manager's determination regarding an individual item shall not extend to the entire assembly in which the item functions.
- C. Program Manager's review of submittals shall not relieve Contractor of responsibility for any deviation from requirements of Contract Documents unless Contractor has informed Program Manager in writing of such deviation at time of submission and Program Manager has given written acknowledgment of the specific deviation.

Program Manager's review shall in no way relieve Contractor from responsibility for errors or omissions in submittals.

- D. Program Manager will return submittals to the Contractor marked with appropriate comments as defined below:
 - 1. "Reviewed" indicates the drawings have been reviewed for conformance with design and no exceptions are taken. Proceed with the work.
 - 2. "Revise and Resubmit" indicates the annotations are to be confirmed in a resubmittal of the affected drawing. However, subject to prior arrangement with the Engineer, the Contractor may proceed with the work as annotated during the interim required for resubmittal.
 - 3. "Rejected" indicates drawing to be revised and resubmitted for further review prior to proceeding with the work.
 - 4. "Furnish as Corrected" indicates Contractor is to move forward with minor corrections as indicated. A resubmittal to the Program Manager is not required before purchasing and/or proceeding. A final submittal with corrections will be submitted to the Program Manager upon completion.
- E. Program Manager will return one (1) copy in PDF format for printing and distribution by Contractor.

3.07 RESUBMISSION

- A. Make corrections and changes indicated for unacceptable submissions and resubmit in same manner as specified above. Resubmission for review shall be made by Contractor within 10 working days of documented receipt of returned submittals by Contractor.
- B. In resubmission transmittal direct specific attention to revisions other than corrections requested by Program Manager on previous submissions, if any.
- C. Shop drawings and product data:
 - 1. Revise initial drawings or data, and resubmit as specified for the initial submittal.
 - 2. Indicate any changes made other than those requested by the Owner's Representative
- D. Samples:
 - 1. Submit new samples as required for initial submittal.

3.08 DISTRIBUTION

- A. Contractor is responsible for obtaining and distributing copies of submittals to his Subcontractors and material suppliers after as well as before final approval.
- B. Contractor shall maintain a file of processed submittals for the duration of the project, including a complete set in the field or field office.

C. Distribute shop drawings and product data reviewed by the Owner's Representative to:

1. Job Site file
2. Subcontractors
3. Supplier or Manufacturer
4. As requested by Owner

END OF SECTION

SECTION 01310
CONSTRUCTION SCHEDULE
(To be used for work orders)

PART 1 - GENERAL

1.01 SUMMARY

Section includes progress documentation requirements.

1.02 SUBMITTALS

A three-week look ahead schedule will be provided within 14 days of the Kick-off meeting and continued throughout the length of the Contract. The Schedule will be updated and presented at the Bi-Weekly Progress Meeting.

1.03 FORM OF SUBMITTALS

A. Schedules - General:

1. Schedules are assignment related and will be generated only as requested by the Program Manager.
2. Provide legend of symbols and abbreviations for each schedule.
3. Use the same terminology as that used in the contract documents.

B. Format - Bar Chart:

1. Provide individual horizontal bars representing the duration of each major activity.
2. Coordinate each element on the schedule with other construction activities.
3. Show activities in proper sequence, including submittals, equipment delivery, materials delivery, installation, and testing.
4. Include cost bar at top of chart showing estimated cost of Work performed at the date of each application for payment.
5. Use vertical lines to mark the time scale at not more than 1-week intervals.
6. Use sheets of sufficient number and width to show the full schedule clearly.
7. Use of Critical Path Methodology while developing the schedule. Tasks on the critical path shall be indicated in RED.

C. Copies: Submit a minimum of two copies.

PART 2 – PRODUCTS

2.01 SOFTWARE / PROGRAMS

Schedules shall be prepared in Primavera P6 or, with County approval, Microsoft Project.

PART 3 - EXECUTION

3.01 CONSTRUCTION SCHEDULE

- A. Prepare and submit construction schedule.
- B. Provide construction schedule in the form of bar charts.
- C. The County will promptly review the schedule and notify the Contractor of acceptability. If schedule is not satisfactory, the Contractor shall revise and resubmit within 3 days.
- D. Make and distribute copies of accepted schedule to the County, to subcontractors, and to other entities whose Work will be influenced by schedule dates.
- E. Update the schedule whenever changes occur or are made, or when new information is received, but not less often than at the same intervals at which applications for payment are made. Payments may be withheld if schedule updates are not submitted as required.
- F. The initial schedule and update information shall be provided by the Contractor. This information is a representation of the best efforts of the Contractor and its subcontractors as to how they envision the Work to be accomplished. Similarly, progress information to be provided by and through the Contractor shall be an accurate representation of its or its subcontractors' or suppliers' actual performance. The schedule shall remain an accurate reflection of the Contractor's actual or projected sequencing of Work. Once accepted, adherence to the established schedule shall be obligatory upon the Contractor and its subcontractors for the Work under this Contract. The County may require the Contractor to revise the schedule if, in its judgment, the schedule does not accurately reflect the actual execution of the Work, or is in violation of any provision on this scheduling specification. The Contractor shall revise the schedule as often as is required or necessary during the course of performance of the Work without additional cost to the County.

3.02 PROGRESS OF WORK

- A. The Work shall be started on the date indicated in the Notice to Proceed coinciding with the baseline construction schedule and shall be executed with such progress as may be required to prevent delay to other contractors or to the general completion of the project. The Work shall be executed at such times and in or on such parts of the project, and with such forces, material, and equipment, as to assure completion of the Work in the time established by the Contract. Additionally, the Contractor shall

schedule and direct Work so to provide an orderly progression of the Work to completion within the specified Contract Time.

- B. The Contractor agrees that whenever it becomes apparent from the current accepted monthly schedule update, that delays to the project have resulted and these delays are through no fault of the County, and hence, that the Contract completion date will not be met, or when so directed by the County, the Contractor shall take some or all of the following actions at no additional cost to the County.
1. Increase construction Work force in such quantities and crafts as shall substantially eliminate the backlog of Work.
 2. Increase the number of working hours per shift; shifts per working day, or days per week; the amount of construction equipment, etc., or any combination of the foregoing to substantially eliminate the backlog of Work.
 3. Schedule activities to achieve maximum practical concurrence of accomplishment of activities, and comply with the revised schedule.
 4. The Contractor shall submit for reviewing a written statement of the steps it intends to take, to remove, or arrest the delay to the schedule. If the Contractor fails to submit a written statement of the steps it intends to take or fails to take such steps as required by the Contract, the County may direct the level of effort in workforce (trades), equipment, and Work schedule (overtime) to remove or arrest the delay to the project in the accepted schedule, and the Contractor shall promptly provide such level of effort at no additional cost to the County. In addition, should schedule delays persist; the Contractor's bond agent shall be asked to attend meetings to update the schedule.
- C. Failure of the Contractor to comply with the requirements of this provision shall subject it to, at the County's sole discretion, withholding, in partial or in total, payments otherwise due the Contractor for Work performed under this Contract. The Contractor agrees that any withholding of moneys is not a penalty for noncompliance, but is an assurance for the County that funds shall be available to implement these requirements should the Contractor fail to do so, since failure of the Contractor to comply with these requirements shall mean that the Contractor failed to execute the Work with such diligence as to ensure its completion within the time for completion.

END OF SECTION

SECTION 01320
PROGRESS REPORTS & VIDEOS

PART 1 – GENERAL

1.01 SECTION INCLUDES

This Section includes administrative and procedural requirements for documenting the progress of assessment during performance of the Work, including the following:

- A. Contractor's Construction Schedule
- B. Submittals Schedule
- C. Daily Reports
- D. Pre & Post Work Site Videos

1.02 RELATED SECTIONS

- A. Section 01300 - Submittals
- B. Section 01310 - Scheduling of Work
- C. Section 01420 - Inspection of Work
- D. Section 01700 - Project Closeout

1.03 SUBMITTALS

A. DAILY REPORTS

1. The Contractor's Superintendent shall prepare and submit Daily Reports throughout the project, from Notice to Proceed to Final Acceptance. Daily Reports shall be kept in an orderly manner, available for inspection or review when requested by the County and Program Manager. Copies of Daily Reports shall be accumulated and submitted to the Program Manager on a weekly basis, on a regular day and time to be determined by the Program Manager. Failure to submit Daily Reports or to comply with the format requirements below is cause for the County to retain additional monies due the Contractor from the monthly Application(s) for Payment until such time as the reports have been brought up to date by the Contractor.
2. Each Report shall include the following information at a minimum:
 - a. Manpower by subcontractor, trade, and skill level
 - b. Weather and temperatures (summary of conditions)
 - c. List of visitors to the jobsite
 - d. Specific work performed with locations

- e. Digital Pictures of the work performed, with descriptions of each picture
 - f. Situations or circumstances which could delay the Work or give cause for a time extension or additional cost
 - g. Instructions requested (and of whom)
 - h. Materials received
 - i. Major equipment arrival/departure
 - j. Total days accrued under the terms of the Contract Documents
 - k. Accidents and incidents
 - l. Safety issues
 - m. Meetings
 - n. A copy of a delivery receipt of all deliveries, to the project on that day, of equipment and/or materials
 - o. A copy of all field reports from testing activities that were performed
 - p. Other significant events at the jobsite
3. Daily Production Log: The Contractor shall prepare and submit Daily Production Logs for the CCTV/Cleaning and TISCIT assessment upon completion of the internal QA/QC for the work, but not to exceed one work week (5-days) in duration.
- a. Daily Production Log – CCTV: The Contractor shall prepare and submit Daily Production Logs for the CCTV assessment. Each Report shall include the following information at a minimum:
 - 1) Project Name
 - 2) Date
 - 3) Upstream MH Asset ID
 - 4) Downstream MH Asset ID
 - 5) Pipe Size
 - 6) Feet Completed
 - 7) Light Cleaning
 - 8) Heavy Cleaning
 - 9) Address
 - 10) Completed Y/N
 - 11) Comments
 - 12) Direction (U/D)
 - 13) Operator
 - 14) Reverse (Y/N)
 - b. Daily Production Log – TISCIT: The Contractor shall prepare and submit Daily Production Logs for the TISCIT assessment
 - 1) Each Report shall include the same fields as the Daily Production Log-CCTV with the exception of Light and Heavy Cleaning,
 - c. Daily Schedule: Provide location and activity for all crews to be utilized in scheduling inspections.
4. The Contractor shall take the necessary action required to specifically alert the Program Manager to potential items impacting the progress of the Work. Such items shall be clearly highlighted in the report.

5. All Daily Reports shall be typed.
6. Contractor must adhere to reporting requirements in this Specification Section as well as any other reporting requirements listed in other Specification Sections, specifically those related to reporting associated with assessment activities.

B. VIDEOS

1. Accompanying each work order and prior to the beginning of any work, the Contractor shall take a pre-site work video of the site work area to record existing conditions. Video shall show all conditions which might later be subject to disagreement. These conditions shall be shown in sufficient detail to provide a basis for decisions. The video shall be submitted in external hard drive format, with a log of the items taped prior to assessment activities. No request for payments will be processed until the pre-site work video has been submitted and approved by the Program Manager. 2 copies each are required for close-out. Failure to capture sufficient and irrefutable detail necessary to defend against a claim will render the Contractor responsible for correcting any such claim at his own expense.
2. Following completion of the work, another recording shall be made showing the same site work areas and features as in the pre-site work video. Post-site work video shall be made prior to final acceptance and before submitting a request for final payment. Video shall be submitted in external hard drive format, with a log of the items taped, with the final payment application. 2 copies each are required for close-out.
3. At the conclusion of the Project, the Contractor shall have all videos generated for the project consolidated and copied onto an external hard drive and prepare a Table of Contents for the drive. A copy of the external hard drive and Table of Contents for the external hard drive shall be transmitted to the Program Manager with the request for final payment. 2 copies each are required for close-out.

PART 2 – PRODUCTS

(not used)

PART 3 – EXECUTION

(not used)

END OF SECTION

SECTION 01335
PUBLIC OUTREACH (SMALL PROJECTS)

PART 1 - GENERAL

1.01 SCOPE

Public outreach related to the Project shall be directed and led by the County's DWM Public Outreach Office (DWMPOO), through a public communications and outreach specialist (PCOS) assigned by the County. The Contractor shall assist and support the County's PCOS by ensuring that a nominated Contractor employee is available and trained to support the outreach efforts as specified herein.

1.02 STAFFING

- A. The Contractor shall designate a public outreach contact (POC) on the construction crew to continuously coordinate and provide information regarding customer service issues at the project site to the County's construction manager, who will notify DWMPOO and PCOS.
1. The POC shall have responsibility for coordinating with the PCOS in receiving, logging, tracking, responding, and resolving customer/citizen complaints and Claims, providing notices to and personal interaction with affected customers/citizens at the site regarding project impact and projected work schedules.
 2. The POC shall have the responsibility of reporting to the PCOS any unforeseen construction incidents with the potential to impact community quality of life and updating and coordinating with PCOS to implement appropriate responses and/or, notifications to and personal interactions with affected customers/citizens.
 3. The POC shall participate in an orientation session presented by DWMPOO focusing on established protocols and procedures for conducting on-site public outreach activities during construction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PUBLIC INFORMATION KICK-OFF MEETING (AT DWM DISCRETION)

- A. Prior to commencement of Work under the Contract and following the preconstruction meeting, the Contractor, the PCOS, and the County shall attend a meeting hosted by the Program Manager. At this meeting, the Contractor's responsibilities and the relationship with the DWMPOO and PCOS and the functions and responsibilities of the POC employed by the Contractor, according to Section 1.02 A, will be discussed. The Contractor's POC and backup individual(s) shall be

identified to the DWM's call center, DWMPOO and PCOS, with 24/7 contact telephone numbers provided.

3.02 RESPONSIBILITIES OF THE POC

- A. The duties of the Contractor's POC shall be as defined below and may be expanded by the Program Manager.
 - 1. Coordinating with PCOS for the logging, tracking, and resolving customer/citizen complaints and Claims, when received by the Contractor, and providing periodic updates and reports as specified.
 - 2. Working with PCOS to develop and implement a plan for providing notice to affected customers/citizens in the event there are scheduled service outages or other Work elements required for the performance of Work under the Agreement that are scheduled that shall have an impact on the neighborhood or property owners, and executing the plan once approved by DWMPOO.
 - 3. Attending and participating in scheduled Project progress meetings for discussion, updates, review of complaints log and potential resolution to customer/citizen complaints, Claims, review of schedules, and other matters, as required.
 - 4. Planning, attending and participating in periodic public meetings and working with the DWMPOO to promote and prepare necessary Project information in advance of these meetings.
- B. In the event Work is required on private property where an easement has been acquired, the POC shall assist the PCOS in notifying the property owner at least fourteen (14) days in advance of commencement of the Work, in writing, with a copy provided to the DWMPOO. In no case will customers/citizens be contacted by Contractor without DWMPOO approval of both the communication plan and of any literature provided to customers/citizens.
- C. Prior to commencement of work in neighborhoods, the POC shall work with the PCOS to notify the customers/citizens fourteen (14) to thirty (30) days in advance. In no case will customers/citizens be contacted by Contractor without DWMPOO approval of both the communication plan and of literature provided to customers/citizens. In addition, 72 hours prior to actual commencement of the work, the POC shall notify the customers/citizens via door hangers as hereinafter provided for in this Section. Such notices shall be coordinated with the Program Manager and Public Outreach Office.
- D. The PCOS shall be responsible for managing those notifications within the context of the Project schedule and the approved Project procedures, in coordination with the POC. The POC shall assist the County Site staff with the resolution of public outreach-related items that might delay or disrupt the Project work.
- E. In the event the POC is away from Work, the Contractor shall designate a second individual, who shall be fully familiar and aware of the duties and prosecution of the Work, to handle the outreach coordination responsibilities and functions.
- F. The POC shall assist the PCOS in coordination of communications related to street closures, detours, and traffic pattern changes with the Contractor's field

management staff, the County's construction manager, and the Department of Public Works or the GDOT.

- G. In the event there is an emergency involving the public or a situation where media inquiries and responses are possible, the POC shall notify the County's PCOS immediately. The PCOS will then coordinate with the County's public relations/media relations manager for appropriate action. Under no circumstance and at no time shall the Contractor or any of its employees, Subcontractors or vendors of the Contractor make comments to the media regarding the Project.

3.03 ISSUES MANAGEMENT TRACKING

- A. The County shall develop, implement, and maintain an organized and comprehensive issues management strategy for tracking customer/citizen complaints, Claims, and inquiries. Related information shall be updated on a daily basis by the PCOS with input from the Contractor's POC. Tracking information and responses shall be coordinated with the DWMPOO.
- B. Information recorded shall include, but not be limited to, the following:
 - 1. Date complaint/claim/inquiry received
 - 2. Name, address and telephone number of individual filing complaint/claim/inquiry
 - 3. Nature of complaint/claim/inquiry
 - 4. Address where problem is located if different than above
 - 5. Action required, date, action taken, date action completed
 - 6. Follow-up with person who filed under number two (2) above, to verify satisfaction or status
 - 7. Documents associated with actions taken
 - 8. Any information regarding resolution with the Contractor's, Subcontractor's, or vendor's insurance company shall be fully documented
- C. In no case will customers/citizens be contacted by Contractor without DWMPOO approval of both the communication plan and of literature provided to customers/citizens.

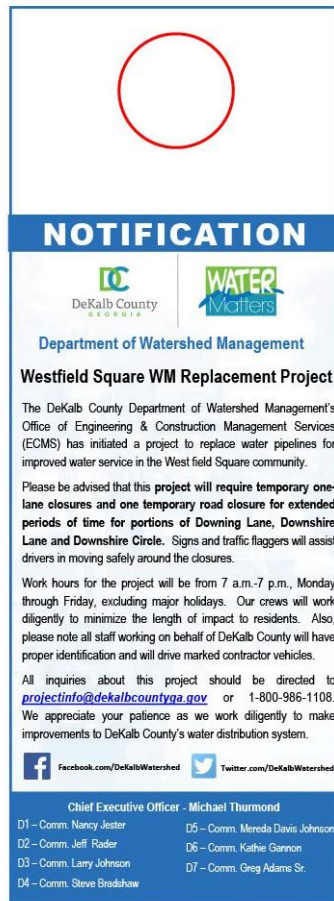
3.04 DOOR HANGERS

The Contractor shall produce door hangers required for notice to customers/citizens and residents from the template provided by the County's DWMPOO (see example at the end of this Section) as specified above in paragraph 3.02. Door hangers shall be utilized for notification in event of, but not limited to, the following events:

- A. Planned service disruption/outages
- B. Road closures/detours/traffic pattern changes
- C. Access/entrance to property
- D. Work startup
- E. Smoke testing
- F. Blasting

The PCOS shall be notified twenty-four (24) hours in advance of any door hanging activity by the Contractor.

Sample 1. Door Hanger



3.05 IMPACTED AREA ADDRESS DATABASE

- A. The Contractor shall provide the PCOS with a database of addresses and phone numbers (and names if available) of Project-affected residences, businesses, and

facilities at least three (3) weeks prior to Project startup. The database will be used by the DWMPOO for regular citizen communications and notifications.

- B. The Contractor shall copy the PCOS on correspondence and Right-of-Entry Agreements with citizens and property owners.

3.06 SCHEDULE

- A. The Contractor shall provide the PCOS with a copy of the detailed Project schedule following approval by the County.
- B. Biweekly, the Contractor shall provide a list of properties:
 - 1. That shall be affected by the Contractor's activities within the upcoming four (4) weeks.
 - 2. Where work is ongoing in the right of way in front or in the back of the property.
 - 3. Where site restoration activities are ongoing.
- C. The Contractor shall inform the PCOS through the weekly progress meetings and in writing of Project schedule changes or changes in disruptive work, such as blasting and road closures that would have significant impact on citizens or require prior citizen notification.

3.07 MEDIA RELATIONS AND JOB SITE INQUIRIES

- A. As specified above in paragraph 3.01, only authorized persons with the County shall release information in response to media inquiries. The Contractor's field personnel shall keep Project information cards available that shall be provided to media and citizens if inquiries are made onsite. Media and citizen inquiries shall be directed to the PCOS via the Project information email or phone line.
- B. Project information cards shall be produced from the template provided by the public outreach team.

3.08 NOTIFICATIONS

The Contractor shall provide the following notifications to the DWMPOO to facilitate its communication with affected citizens through hand-distributed flyers or mailers:

- A. Anticipated work start date - notify at least four (4) weeks prior to start of construction so that PCOS can send out mailers or door hangers two (2) weeks prior and/or distribute notification letters seventy-two (72) hours before construction begins.
- B. Service disruptions - notify PCOS at least two (2) weeks in advance so that door hangers can be produced and distributed at least seventy-two (72) hours prior to the start of disruption.
- C. Full Road Closure - notify PCOS at least three (3) weeks in advance so that door hangers or notification letters can be produced and distributed at least seventy-two

(72) hours prior to the start of closure, preferably two (2) weeks before closure goes into effect.

- D. Significant work in a neighborhood: Blasting, directional drilling, trenchless installation, and open cut shall require letter or door hanger notification of the PCOS at least seventy-two (72) hours in advance.
- E. The Contractor shall provide the following door hanger notifications and the personnel to deliver them, at a minimum:
 - 1. Service disruptions: notice to citizens seventy-two (72) hours prior to disruption.
 - 2. Full street or partial closure: Notify fire, police, other emergency services, and other authorities seventy-two (72) hours prior to street closure, preferably two (2) weeks in advance for full closure.
 - 3. Significant work in neighborhoods: such as Blasting, directional drilling, and trenchless installation, or open cut, etc.: Notify citizens via door hangers or letters seventy-two (72) hours in advance.
- F. The Contractor shall be fully responsible for notification to emergency-related services for detours, closures (partial or full) or traffic pattern changes and shall be detailed in their traffic control plan and implemented through the Contractor's traffic control manager and per permitting requirements.
- G. The Contractor shall be fully responsible for distributing notifications a minimum of seventy-two (72) hours in advance of service outages for schools, nursing homes, hospitals, medical clinics, assisted living facilities, or other types of facilities. Contractor shall make personal contact with facility representatives no later than sixty (60) minutes prior to the outage.
- H. The Contractor shall at all times coordinate with the PCOS and call center to provide detailed schedules and street locations for service disruptions or street closures to verify that DWM customer service call center is well equipped to provide adequate response to citizen inquiries.

3.09 RESOLUTION OF COMPLAINTS AND CLAIMS

- A. Failure of the Contractor to resolve any legitimate complaint or Claim filed resulting from the Work performed under this Contract, following notice in accordance with the General Requirements, shall result in resolution of the complaint or Claim by the County. The Contractor shall be charged for the associated cost in accordance with the applicable General Requirements of the contract. No additional payment shall be made to the Contractor for costs associated with complaint or Claim resolution, same being incidental to the various contract items that are Bid. Failure to manage the issues and items adequately to minimize public complaints and impacts shall be the cause for increasing the retainage, withholding payment, or notice and termination of the Contractor for cause when more than ten (10) percent of the noticed complaints or Claims past thirty (30) days are without decisive resolution and scheduling of recovery Work.

END OF SECTION

SECTION 01410
TESTING LABORATORY SERVICES

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This Section includes testing the Program Manager 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 Program Manager 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 Program Manager 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 Program Manager 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 Program Manager 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 Program Manager 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 Program Manager 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 Program Manager 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 International (ASTM)

1.03 DELIVERY, STORAGE & HANDLING

Promptly process and distribute all required copies of test reports and related instructions to ensure 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 Program Manager, 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 Program Manager. The test lab may provide test reports and related instructions directly to the Contractor provided the Program Manager 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 Program Manager 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 Program Manager 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 Program Manager. 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 Program Manager 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 safeguard 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 01420
INSPECTION OF WORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

This section includes guidelines for the inspection of contract work.

1.02 QUALIFICATIONS AND REQUIREMENTS

- A. The Program Manager shall have the right of access to and inspection of the work at all times. Materials, equipment, and products shall be subject to the Program Manager's review as specified herein. Safe access must be provided to the Program Manager, with the understanding that no Work which cannot be safely accessed will not be paid for until safe access is provided for full and complete review of the Work.
- B. The Program Manager is not responsible for construction means, methods, sequences, or procedures or for safety precautions and programs in connection with the work. The Program Manager is not responsible for supervision of the work and shall not give instruction to the Contractor's personnel as to methods of executing the work. The Program Manager is not responsible for the Contractor's failure to carry out the work in accordance with the Contract Documents.
- C. Any government representative or other individual identified by the Program Manager shall have safe access to the work wherever it is in preparation or progress. The Contractor shall provide proper facilities for such access and inspection.

1.03 RESPONSIBILITY OF THE CONTRACTOR

- A. The Contractor is responsible for all materials, equipment, methods, and procedures in execution of the work.
- B. The Contractor shall correct, to the satisfaction of the Program Manager, any work or material found to be defective or of deficient quality. Such corrections shall be made by the Contractor at no additional expense to the Owner.

1.04 RIGHT OF ENTRY

Representatives of DeKalb County, the Environmental Protection Division of the Georgia Department of Natural Resources, and the U.S. Environmental Protection Agency and others, as may be identified by the Program Manager, shall have safe and suitable access to the work whenever it is in preparation or progress. The Contractor shall provide proper facilities for such access and inspection.

END OF SECTION

SECTION 01510

SANITARY SEWER MAIN TELEVISION AND SONAR INSPECTION

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This section includes guidelines and requirements for closed circuit television (CCTV) and SONAR 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 rehabilitation work, cleaning, etc. as required.

1.02 REFERENCES

- A. Codes, Specifications, and Standards
 - 1. NASSCO – National Association of Sewer Service Companies – Pipeline Assessment Certification Program (PACP) Reference Manual, Version 7.0.3, January 2018 or latest version.
- B. Manual on 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 7.0.3, Section 2 for related information)

1.03 RELATED SECTIONS

- A. Section 01056 – GPS Data Collection
- B. Section 01320 - Progress Reports & Videos
- 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 for verification of existing internal pipe conditions including pipe materials, pipe size, pipe grade, connections, cracks, leaking joints, seepage and roots. Contractor shall furnish all labor, materials, equipment, tools, and other incidental services for closed circuit television inspection (CCTV).
 - 1. “Pre-CCTV” Inspection: Utilized to determine causation for a sanitary Sewer Overflow. This activity is the same as CCTV with the exception of cleaning which is not required. The submittals are the same as CCTV but as the pipe is not cleaned, the coding will be for only those defects

that are visible. There is a high probability that the segment cannot be successfully completed, thus a reverse setup will be required. Flow control is a requirement.

2. "Post-CCTV" Inspection: Utilized to assess the pipe condition and clean the associated Pre-CCTV assignment. Pre and Post-CCTV inspections are coupled, with the Post not being required if the Pre-CCTV does not need cleaning. "Post-CCTV" Inspections are the same operationally as CCTV Inspections.
- 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 that connects to the computer via a high-speed interface cable. The interface cable allows the external hard drive to communicate with the computer so that data may be passed back and forth. The Contractor will deliver all inspection standard exchange databases, digital reports and media to the County/Project Manager on an external hard drive that is compatible with the County and Project Manager's equipment and software and will be of adequate storage to contain all deliverables as outlined in the Specifications.
 - D. SFTP Data Transfer: The SFTP is a Secured File Transfer Protocol that will allow secure data transfer from a remote location by way of a unique key file. The Contractor will deliver all inspection standard exchange databases, digital reports, and media to the County/Project Manager via the SFTP site as outlined in the Specifications. The Project Manager will provide the key file and detailed instructions on how to establish a connection.
 - E. Sonar/Totally Integrated Sonar and CCTV Inspection Technique (TISCIT): Operation necessary to complete a simultaneous CCTV and sonar inspection for verification of existing internal conditions. Both the CCTV and sonar will be displayed together on the audiovisual documentation. Contractor shall furnish all labor, materials, equipment, tools, and other incidental services for the sonar/TISCIT inspection.
 - F. Buried Manhole: A manhole where the manhole cover (lid) is not visible at ground surface. Buried manholes usually require removing the material covering the manhole lid and raising the manhole frame and cover (lid). All buried manholes on the sanitary systems shall be reported for raising following their location discovery by the Contractor (Reference Specification Section 02607). Subsequently, the raised manholes shall be inspected.
 1. Note that manholes located as indicated on the County's mapping system and covered with a small layer of forest litter and/or a thin layer

of soil or grass and where the location is apparent does not represent a “buried” manhole for “Locate & Expose” purposes.

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, or submitted electronically, 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. This video submittal is expected to represent the standard quality that the Contractor will provide throughout the Contract for all video submittals from all crews.
 - 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 unique name that are 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 that the direction of the inspection and inspection date be included as well.

- D. Camera specification sheet
- E. Sonar/TISCIT survey equipment specification sheet
- F. References: Contact names and telephone numbers
- G. List of staff and equipment to be used on this Project
- H. Supervisor and field crew leader's contact information including name and mobile telephone numbers
- I. Confined space entry certification that staff to be used on this project have been properly trained should confined space entry be required
- J. Contractor's Safety Plan
- K. Training and inspection plan a minimum of 7 days prior to the first inspection
- L. 14 day look ahead schedule weekly based on Program Manager's work priority schedule
- M. Public notification door hanger based on Program Manager's provided example
- N. Inspection (See Documentation Section for additional information);
 - 1. Initial first day's inspections within 24 hours after first day's work is completed.
- O. 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)
- P. Traffic control plan
- Q. 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 County with written documentation (certification) that the supervisor, field crew leader and all crewmembers responsible for these work orders 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 for the Field Crew Supervisor shall be documented in the Contractor's Bid submittal. Field Crew Leader qualifications will be reviewed and approved (if appropriate) by the Program Manager.
- F. 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 that is 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.

PART 2 – PRODUCTS

2.01 CCTV/SONAR PERFORMANCE

- A. The Contractor shall furnish the following, but not limited to: the mobile (off-road) television/sonar 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; Easement machine necessary to perform cleaning of lines.
- 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/sonar 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 Program Manager 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/sonar cables and/or lines used to measure the CCTV camera's/sonar 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 shall carry or have access to flow control plugs as required to accommodate the diameter range in which inspection is to occur. 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" and "Heavy Cleaning". See the definition of "Light Cleaning" and "Heavy Cleaning" in Sanitary Sewer Cleaning Specification 02956 for details.
- H. Television/Sonar 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 County 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 County'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/Sonar Head Prime Position:

The CCTV camera/sonar 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/sonar 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/Sonar 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 pipeline 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 without lens fogging and any conditions that may be encountered in the inspection environment. Camera lens will be free of scratches and other faults that may reduce the video quality. The operator will take precautions to clean the lens of all foreign matter prior to inserting the camera and will attempt to reduce the amount of water on the lens during the survey/cleaning process.
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/Sonar:

All CCTV and/or sonar work will use color CCTV/sonar reproduction.

O. CCTV Side Scanning Camera:

The Program Manager will consider high resolution digital CCTV 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.

P. Sonar Survey Requirements:

1. Sonar assessment will provide for a continuous output on external hard drive format of all sewers surveyed, supported by complete defect code sheets. Additionally, silt levels will be assessed as a percentage depth of sewers at a minimum of twenty-five (25) foot intervals for each pipeline surveyed in addition to locations where the silt layer varies from the previous by 5% or more.
2. Where combined CCTV and sonar imagery is used the output will display combined CCTV and sonar images of the sewer being surveyed. The sonar image will be superimposed on the real CCTV image as a combined operation.

Q. The survey/inspection vehicle for general public streets or accessible 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.

- R. 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.
- S. The vehicle will be suitable for carrying the survey team and laborers and the equipment necessary to safely perform the work.
- T. 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 – EXECUTION

3.01 GENERAL

- A. The following guidelines concerning the use of CCTV and sonar 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 diameter at the start of the survey. A case-by-case determination will be made whether to use CCTV where the depth of flow is more than twenty-five (25%) percent level but no greater than forty (40%) percent of overall sewer diameter at any time throughout the length. The use of flow control (plugging, flow restriction and/or bypassing pumping) to reduce flow to 25% or less is required.
 - 2. Generally CCTV combined with sonar will be used for internal condition assessment where depth of flow of sewage varies from twenty-five (25%) percent to seventy-five (75%) percent of overall sewer diameter for sewers greater than or equal to eighteen (18) inches in diameter. Where the sewer is less than eighteen (18) inches in diameter and depth of flow of sewage exceeds twenty-five (25%) percent but is less than seventy-five (75%) percent of overall sewer diameter one of the following actions may be taken based on the Contractor and Program Manager's agreement: (a) continue using CCTV (where depth of flow is only marginally greater than twenty-five (25%) percent of overall diameter) or (b) use sonar (by damming or plugging the sewer so that the depth of flow exceeds seventy-five (75%) percent of overall diameter) or (c) use plugging and/or bypassing to reduce flow to 25% or less.
 - 3. Generally sonar alone will be used where depth of flow in the sewer exceeds seventy-five (75%) percent of overall diameter and the level of the flow will be artificially increased, without the risk of flooding, to ensure that the pipe is completely surcharged.
- 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: 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 that will allow compliance 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 closed-circuit television. 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 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/sonar inspection (tractor mounted) 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, such that 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 that restrict flow and cause inspection to be interrupted. Assure that 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. Televisе 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 County 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 Program Manager may, on occasion, accept a physical inspection that does not adhere to minimum standards if adverse conditions are encountered and re-inspection is not advised.
- U. At the end of each day, update the status of what sewer segments were inspected using the web-based mobile device. Refer to Section 01030 – Special Project Procedures.

3.02 CCTV/SONAR INSPECTION

- A. Data Transfer: Upon completion of CCTV inspection, transfer inspection data to an external hard drive (HD) of sufficient capacity and compatibility with County'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 County
 - 2. Project title
 - 3. Date of submittal
 - 4. Inspection company
 - 5. Deliverable number
 - 6. Project work order 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 segment inspection. 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:
 - [Upstream
Manhole]_[DownstreamManhole]_[MMDDYYYY]_[Incremental
Number].mpg
 - e. The "IncrementalNumber" shall be used if multiple inspections are performed for the same line, such as a reverse inspection setup. IncrementalNumber is to ensure no two videos are the same. The number can be the video ID if the software doesn't already have a random number generator.

- f. The County, 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 County.
 - 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 County 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 PACP Version 6 or newer Access Standard Exchange database consolidated per work order since previous submittal. Creating a database per inspection is not acceptable. Each submittal standard exchange database shall be cumulative containing inspections conducted during interim period since previous submittal.
 - 2. Provide PACP standard exchange database of collected data including anticipated inspection header field attribute information as shown in **Attachment A** to this Section.
 - 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/sonar 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 device that enables 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. Regardless, each set-up will be recorded as a separate inspection and the header and observed defects recorded appropriately. Video digits will be recorded so that 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 digitally 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 County's GIS.

3.03 DELIVERABLES

- A. Digital PACP Standard Exchange database shall be submitted on external hard drive to the Program Manager. The database must contain all the data required by this specification.
- B. Final Television/Sonar 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.

3.04 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 which pass 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. Expedited Work may only require 24 hour notice before conducting Work upon approval by County. The Contractor shall distribute the door hangers to the property owners (residential, commercial and institutional) in the affected area(s). 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. The Contractor must notify Public Outreach before notification to the property owners. If

CCTV inspection is delayed, the Contractor must re-distribute door hangers.

2. 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 County and/or Program Manager upon request.
- C. The Contractor shall alert the appropriate County 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.

3.05 QUALITY ASSURANCE/QUALITY CONTROL

- A. Prior to assessment data submission to the Program Manager, the Contractor shall perform a Quality Control (QC) check of the inspection documentation using the QC database, System Condition Risk Enhanced Assessment Model (SCREAM), provided by the Program Manager. The queries are developed by the Program Manager and provided to help the Contractor locate data gaps and errors prior to submitting the respective assessment access database. The Program Manager will provide at minimum two hours of training on use of the QC database tool for the Contractor. The Contractor shall correct any data conflict, missing data, or other questionable entry identified by the SCREAM QC reports prior to submitting the CCTV inspection data to the Program Manager. The Contractor shall provide a copy of the QA/QC tool Quality Control Check output to the Program Manager with the submittal. See Special Project Procedures, Specification section 01030, paragraph L, titled "Data Delivery Requirements".
- B. The Program Manager will periodically request the Contractor to review the QC results with the Program Manager.
- C. CCTV video of insufficient quality may result in the line segment being re-CCTV'd at the Contractor's expense, depending upon circumstances. The video must be of sufficient quality to allow a review of the operator's assessment. The Contractor is directed to the initial approved CCTV submittal for quality check.
- D. The Program Manager will perform random review checks of the Contractor's submitted data. Should accuracy or qualitative levels of any of the data fall below those deemed acceptable to the Program Manager; the data submittal will be refused and returned to the Contractor for correction. The Contractor will be required

to correct or re-do inspections until the Program Manager is satisfied with the quality of the work.

- E. The Contractor shall complete work on each asset as described herein. Refer to the Measurement and Payment Section (Section 01025) on documentation requirements to be provided with each pay request.
- F. **Measurement Units:** All dimensions will be in feet and tenths of a foot and/or feet and inches depending upon the technology performed. Measurement of sewers will be to the nearest tenth of a foot.
- G. CCTV Photographs:
 - 1. 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.
- H. 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.

Attachment A - PACP Standard Exchange Database Anticipated Inspection Header Form Attribute Guidance Table (CCTV)

NOTE: All input to be as noted in the PACP Program description with the following additions as noted in the FIELD REQUIRED and Description columns.

NUMBER	FIELD	FIELD REQUIRED	DESCRIPTION/INSTRUCTIONS
1	Surveyed by	Y	
2	Certificate Number	Y	NASSCO PACP # of Surveyor – e.g. U-907-4396
3	Reviewed By	N	
4	Reviewer Certificate No	N	
5	Owner	N	DeKalb DWM
6	Customer	N	DeKalb DWM
7	P/O Number	Y	DeKalb DWM Contract number
8	Work Order Number	Y	DeKalb DWM Work Order number assigned
9	Media Label	Y	
10	Project	Y	SSES OSARP_TIERED Contractor Project Number
11	Date	Y	
12	Time	Y	
13	Sheet Number	Y	
14	Weather	Y	
15	Pre-Cleaning	Y	
16	Date Cleaned	Y	Date when sewer was cleaned prior to survey if applicable, YYYYMMDD
17	Flow Control	Y	
18	Purpose of Survey	N	
19	Direction of Survey	Y	
20	Inspection Technology Used	N	
21	Inspection Status	Y	
22	Consequence of Failure	N	
23	Pressure Value	N	
24	Drainage Area	Y	Sewershed Name – e.g., Nancy Creek or SSO Spill Address – e.g., 123 Main Street
25	Pipe Segment Ref	Y	USMH__DSMH - Pipe Facility ID

NUMBER	FIELD	FIELD REQUIRED	DESCRIPTION/INSTRUCTIONS
26	Street (Name & Number)	Y	
27	City	Y	
28	Location Code	N	
29	Location Details	N	
30	Pipe Use	Y	
31	Height (Diameter)	Y	
32	Width	Y	
33	Shape	Y	
34	Material	Y	
35	Lining Method	Y	
36	Coating Material	Y	
37	Pipe Joint Length	N	
38	Total Length	N	
39	Length Surveyed	Y	
40	Year Constructed	N	
41	Year Renewed	N	
42	Upstream MH Number	Y	Client provided designation for upstream manhole (e.g. 15-304-s122)
43	USMH Rim to Invert	Y	
44	USMH Rim to Grade	Y	
45	USMH Grade to Invert	Y	
46	USMH Northing	N	
47	USMH Easting	N	
48	USMH Elevation	N	
49	Downstream MH Number	Y	Client provided designation for downstream manhole (e.g. 18-325-s289)
50	DSMH Rim to Invert	N	
51	DSMH Rim to Grade	N	
52	DSMH Grade to Invert	N	
53	DSMH Northing	N	GPS Coordinate Northing - NAD83 State Plane Georgia West
54	DSMH Easting	N	GPS Coordinate Easting - NAD83 State Plane Georgia West
55	DSMH Elevation	N	

NUMBER	FIELD	FIELD REQUIRED	DESCRIPTION/INSTRUCTIONS
56	MH Coordinate System	N	
57	MH Vertical Datum	N	
58	GPS Accuracy	N	
	Video Location	Y	For digital recordings, path of video file relative to corresponding data file

Y – Required by NASSCO and/or DeKalb County

END OF SECTION

SECTION 01520
SEWER FLOW CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED SECTIONS

- A. Section 01300 – Submittals
- B. Section 01510 – Sanitary Sewer Main Television and Sonar Inspection
- C. Section 02535 – Gravity Flow Sanitary Sewers
- D. Section 02956 – Sanitary Sewer Cleaning

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 QUALIFICATIONS

- A. Qualification documentation will be submitted as required of the Contract Documents.

- B. The Contractor must meet all of the following criteria to be considered qualified to propose and/or bid on the subject contract:
1. The Contractor, or their subcontractor, must document they, not their parent company, related company, or the experience of an individual/s, have been in this line of business a minimum of five (5) years.
 2. The Contractor, or their subcontractor, must document they, not their parent company, related company, or the experience of an individual/s, have performed gravity sewer bypass/diversion pumping for the sizes of sewer mains and flows expected under this contract in the past two (2) years. This documentation shall include locations, references (including names and phone numbers), pipe sizes, pump sizes and pumping rates. This documentation must include a minimum of ten (10) different projects and must cover the range of sizes of sewer mains and flows expected under this contract.

1.05 SUBMITTALS

- A. Seven (7) calendar days prior to any bypass/diversion pumping activity the Contractor shall submit two (2) hard copies and one electronic copy of the complete and detailed plan to the Program Manager for review and approval as required of Section 01300, Submittals. 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 or equal to 12-inch diameters. Once the Contractor has received written approval from the Program Manager for the smaller than or equal to 12-inch sewer main plan, the Contractor may use the plan without re-submittal. The Contractor is completely responsible for the design, installation, and operations of an effective bypass system. The Program Manager's review is for general conformance only and does not relieve the Contractor of any responsibility.
- B. The bypass/diversion pumping plan submittal shall have sufficient detail to show the following:
1. Lowest overflow point upstream of the bypass/diversion.
 2. Pump stations upstream of the bypass/diversion.
 3. Staging area for pumps.
 4. Sewer plugging method and types of plugs.
 5. Number, size, material, location and method of installation of suction piping 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.
- C. For bypass plans associated with sewer mains larger than 12-inches in diameter, a Georgia certified Professional Engineer must sign and seal the bypass/diversion plan.
- D. The Contractor will provide an emergency response plan for each bypass/diversion pumping system. The plan will be followed in the event of failure of the bypass/diversion pumping system. The plan shall address, at a minimum, protocol for Owner contract, names and phone numbers for twenty-four (24) hour emergency contact 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 Program Manager. The Contractor shall have field personnel onsite while performing bypass operations at all times. The bypass operation shall never be left unattended or unsupervised.
- E. The Contractor must identify all pump stations and the lowest overflow point upstream of the plugging/block and/or bypass/diversion pumping. The Contractor may be required, at no additional cost to the Owner, to station personnel at upstream pump stations and overflow points.
- F. The Contractor shall notify the Program Manager 48 hours prior to commencing any plugging/block and/or bypass/diversion pumping.
- G. 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 (e.g., specialty cleaning, by-pass equipment, etc.).
4. **Submittals:** To the County's Program Manager.
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).
11. **Daily Work:** Work attempted and work accomplished.

1.06 EXPERIENCE

- A. Experience documentation will be submitted as required of the Contract Documents. The Contractor shall provide the Program Manager 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 two (2) 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 crew members shall enter confined spaces without the necessary certified training.
- E. All on-site personnel must be badged by the County.

1.07 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.

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

- A. Reference Specification Section 01030 – Special Project Procedures.

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 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. Steel pipe is permitted for flow diversion.
- C. 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.

- D. 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.
- E. 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.
- F. Irrigation type piping is not allowed.
- G. 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 Program Manager or as indicated in the approved bypass pumping plan.
- H. 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.
- I. If required the Contractor must provide air relief (air relief valves, etc.) on bypass/diversion pumping discharge piping to ensure proper operation.
- J. 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.
- K. Maintain sufficient equipment and materials on site to ensure continuous and successful operation of bypass and dewatering systems.
 - 1. Keep standby pumps fueled and operational at all times.
 - 2. Maintain sufficient number of valves, tees, elbows, connections, tools, sewer plugs, piping, and other parts or system hardware on-site to ensure immediate repair or modification of any part of system as necessary.
- L. Unless specified otherwise in these Specifications or approved by the Program Manager, 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.

- M. 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 Program Manager.
- B. Ensure all levels of sewage flow are continuously and effectively handled.
- C. The Contractor shall use ingenuity and skill to develop a bypass/diversion pumping plan.
- D. 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.
- E. At no cost to the County and Program Manager, 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 Program Manager 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 clean 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.
- F. All materials used for bypass/diversion pumping shall be pre-approved by the Program Manager prior to commencing pumping activities. Materials later determined to be unacceptable shall be replaced with acceptable materials at no additional cost to the Owner.
- G. 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 Program Manager.
- H. 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 Program Manager the system can accommodate the surcharging without any adverse impact.
- I. 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.

- J. 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.
- K. 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 of each section of newly laid sewer before removing the flow diversion from service and placing the newly installed or rehabilitated section into service.
- L. All pipe materials utilized in wastewater flow control shall be in good condition, and free of defects, and leaks. The Contractor, at no cost to the County and Program Manager, 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 Program Manager. 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 accepted industry standards for sound attenuated temporary pumping systems.

3.02 DEPTH OF FLOW

- A. In performing television inspection, joint testing, and/or sealing and other sewer rehabilitation work, the Contractor shall control the depth of flow in the sewer within the following guidelines:

Maximum Pipe Flow Depth

Television Inspection		Joint Testing and Sealing	
Pipe Size	% Pipe Dia.	Pipe Size	% Pipe Dia.
6"-12"	15	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 Program Manager.

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 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 recommended by the Contractor and approved by the Program Manager. The Contractor shall supply the necessary pumps, conduits, and other equipment to 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 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 Program Manager to determine the capacity of the downstream existing system. The Contractor shall request this determination fourteen (14) calendar days prior to the planned bypass/diversion pumping.
- C. The Contractor shall be responsible for 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 at all times. The County will reimburse the Contractor for hourly costs associated with providing manpower, materials and

equipment necessary to continually operate the bypass system at the price bid per hour. The Contractor will provide the Program Manager the minimum personnel requirements for operating the system for review and approval prior to manning the system for continued operation. The payment will be per LF for installation and maintenance and per hour for operation.

- 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 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 to a minimum. Bypass pumping may, at times, have to remain in operation for an extended period of time in situations when the work is stopped and workers have left the site. The Contractor shall be responsible for maintaining, monitoring, managing and implementing a successful pump bypass operation during such occurrences. Compensation for this occurrence is addressed the in Measurement and Payment (paragraph G).

3.05 FLOW CONTROL PRECAUTIONS

- A. Where the wastewater flow is plugged/blocked, the Contractor shall be responsible for taking sufficient precautions to protect public health. The sewer lines shall also be protected from damage. The following shall apply:
 - 1. No wastewater shall be allowed to back up into any homes or buildings.
 - 2. No wastewater shall overflow any manholes, cleanouts, or any other outlet.
 - 3. Customers upstream of the flow control area shall be able to use all their water and sewer utilities without interruption.
 - 4. If any of the above occur or are expected to occur, the Contractor shall provide bypass/diversion pumping to alleviate one or all of the conditions. Additionally, the Contractor shall observe the conditions upstream of the plug and be prepared to immediately start bypass/diversion pumping, if needed.
- B. Any sump pumps, bypass pumps, trash pumps, or any other type of pump, pulling wastewater or any type of material out of the manhole or sewer, shall discharge the material into another manhole, or appropriate vehicle or container approved by the

Program Manager. Under no circumstances shall this material be discharged, stored, or deposited on the ground, swale, road, or open environment.

- C. The Contractor shall take appropriate steps to ensure all pumps, piping, and hoses carrying raw wastewater are protected from traffic. Traffic control shall be performed in accordance with the requirements of the governing agency.
- D. Prior to any wastewater flow control operations the Contractor will identify the pump stations and lowest overflow point upstream of the planned plugging/blocking or bypass/diversion. During operations the Contractor will monitor the pump stations and lowest points to ensure overflow does not occur.
- E. In the event, during any form of "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 Program Manager. The Contractor shall be responsible for any cleanup of solids and stabilization of the area affected. This work shall be performed at the Contractor's expense with no additional cost to the County or Program Manager. The Contractor shall also be responsible for notifying the Program Manager and complying with any and all regulatory requirements for cleaning up the spill at no additional cost to the County. The Contractor shall be responsible for any fines assessed by regulatory agencies including the Georgia Environmental Protection Division (EPD).
- F. During wastewater flow control operations, the Contractor shall take proper precautions to prevent damage to existing sanitary sewer facilities, flooding, or damage to public or private property.
- G. The Contractor shall make repairs, replacements or rebuilds, as directed by the Program Manager, to any portion of the sewer system damaged during any plugging or bypass/diversion pumping operation. All such repairs, replacements, and rebuilding shall be paid for by the Contractor.
- H. The Contractor shall make such provisions, as are necessary, for handling all flows in existing sewers, connections, and manholes by pipes, flumes, or by other approved methods at all times, when his operations would, in any way, interfere with normal functioning of those facilities.
- I. The Contractor shall be responsible for the removal of any debris and sedimentation in the existing sewers, laterals, and manholes, etc., 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.
- J. 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 the County on all security matters and must promptly comply with any project security arrangements established by the County 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 County's facilities.
- J. The Contractor shall only allow entry to authorized persons with proper County-approved identification. All Contractor and Subcontractor employees will be required to have personnel working at these facilities photographed for a County-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 the County. 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 County 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 Form 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

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 Form A.
- E. The Contractor shall require each employee to sign the Employee Acknowledgment of Project Site Rules Log included in Form 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.

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 Contractor'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 Contractor'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 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 County 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:
 1. Neglect of duty, absenteeism, security or safety problems and sleeping on the job
 2. Disorderly conduct, use of abusive or offensive language, quarreling, intimidation by words, actions or fighting.
 3. Theft, vandalism, immoral conduct or any other criminal action.
 4. Selling, consuming, possessing, or being under the influence of intoxicants, alcohol or illegal substances, which produce similar effects while on duty.
 5. Involved in a vehicle accident while on the County's property or driving the County's equipment. No employee, Contractor, or Subcontractor will be extended privileges to drive the County's equipment on the County'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 County.

- 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 **(Forms A & C)**.

1.09 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.

PART 2 - (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.

2.01 General Requirements

- A. 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.
- B. Contractors and subcontractors working on (DWM) projects, sites and facilities must have their assigned badge on their person at all times.
- C. All contractors and subcontractors personnel without a current badge will not be allowed to continue to work at a (DWM) project, site or facility.
- D. 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.
- E. Although a contractor may only be required to visit our sites/property on an infrequent basis, badging is still a requirement.
- F. 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.
- G. 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.

2.02 Training Requirements

- A. Contractor and subcontractor employees are required to attend safety training prior to receiving a badge.
- B. The **Contractor** is responsible for conduction and/or arrangement of their employee's training.
 - 1. 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.
 - 2. 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.
 - 3. 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,"
 - 4. 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.

5. Contractor's training should include general construction safety and the specific safety concerns/hazards employees may encounter at the Watershed Management construction site.
6. 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.
7. Contractor and subcontractor employees are required to read, understand and agree to abide by DeKalb County Project Site Rules. See Forms A & C.

2.03 Verification of Training

- A. 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 Form E.**
- B. (DWM) Verification of Training Document will be sent to VOTD@DeKalbcountyga.gov prior to the contractor's employee badging date of appointment.
- C. The contractor's/subcontractor's employee shall review and verify that the information on their individual (DWM) Verification of Training document is correct.
- D. 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."

2.04 Verification of Identity Requirements

- A. The contractor and subcontractor employees must provide documentation to DeKalb County to verify their identity and authorization to work.
- B. DeKalb County only accepts **Form I-9** acceptable documents with accompanying photo.
- C. **Form I-9** acceptable documents must be from List A and List B
- D. Examples:
 1. ID cards issued by federal, state, local governmental agencies
 2. TWIC (Transportation Worker Identification Credential)
 3. Driver License or Identification card issued by a state motor vehicle department with a photo that clearly identifies the individual.

2.05 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.

2.06 Badging office address is as follows:

**DeKalb County Watershed Management,
Safety Division
1641 Roadhaven Drive, Stone Mountain, GA 30083**

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

2.07 Badge Expiration Date

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

2.08 Transfer Contractors

- A. If a worker changes companies or projects, the badge must be surrendered, and a new badge will be issued if needed.
- B. If applicable, the new employer will provide the employee certification that the safety training is completed.
- C. Only those employees registered in the badging system are eligible to receive a badge,
- D. After verification by the safety representative, the badging database will be updated, and a new badge issued.

2.09 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.

2.010 Additional Training Requirements:

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

2.011 Badge Replacement

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

2.012 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 DWM 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.

This section is intentionally left blank. Forms will follow.

Form A

VISITOR 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:

Form 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
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Form 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:

Form 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
<i>Signature of Company Representative:</i>			<i>Date Signed:</i>

Form 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 01545
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 interferes with or impedes 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.
- C. The County requires a uniformed police officer from the jurisdiction in which the traffic control is required to perform traffic control through signalized intersections. The cost associated with coordinating with and employing the officer will be included in other items bid.

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.

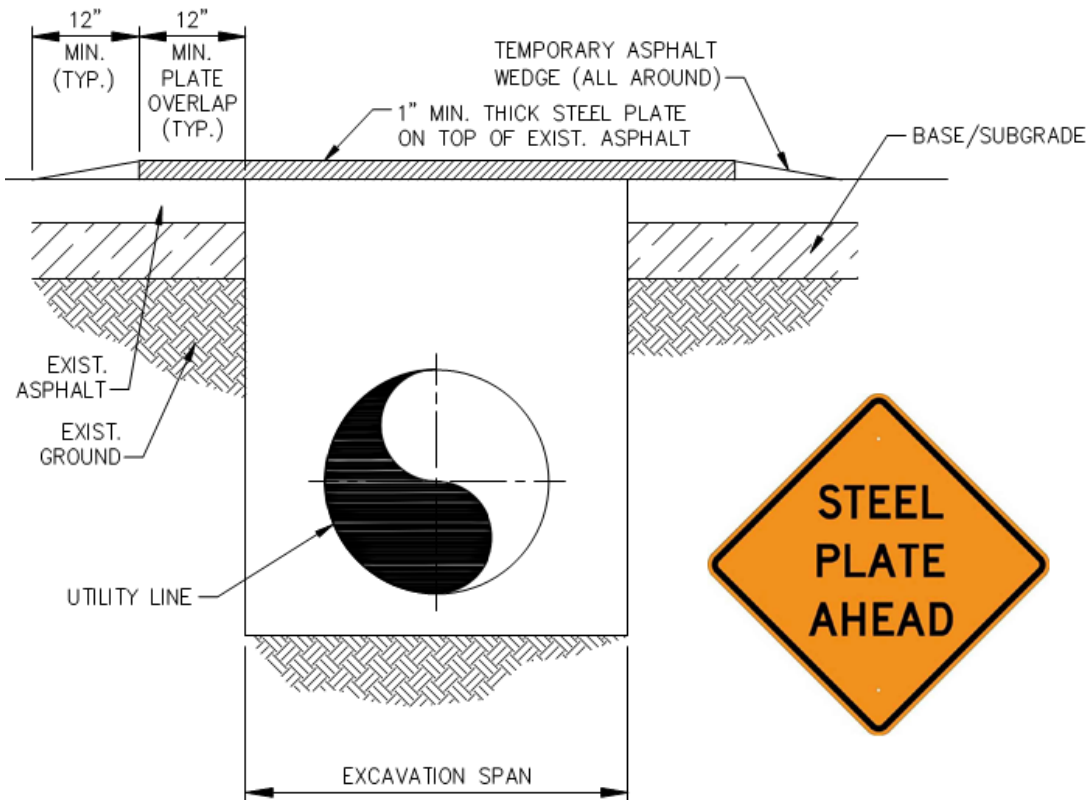
3.010 PROCEDURES FOR TRAFFIC DETOUR ROUTE PLAN

- 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.

3.011 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 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section includes requirements of material and equipment incorporated into the work including, but not limited to:
 - 1. Contractor to conform to applicable specifications and standards.
 - 2. Materials and equipment are to comply with size, make, type and quality specified, or as specifically approved in writing by the Owner.
 - 3. Manufactured and Fabricated Products:
 - a. Design, fabricate and assemble in accord with the best engineering and shop practices.
 - b. Manufacturer like parts of duplicate units to standard size and gages, to be interchangeable.
 - c. Two or more items of the same kind shall be identical, by the same manufacturer.
 - d. Products shall be suitable for service conditions.
 - e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
 - 4. Contractor is not to use material or equipment for any purpose other than what it is designed or is specified for.

1.02 RELATED SECTIONS

- A. General Conditions of the Contract.
- B. Section 01000: Bid Tab
- C. Section 01010: Summary of Work.
- D. Section 01300: Submittals.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Arrange deliveries of Products in accord with construction schedules; coordinate to avoid conflict with work and conditions at the site.
 - 1. Deliver Products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
 - 2. Immediately upon delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals and the Products are properly protected and undamaged.

- B. Provide equipment and personnel to handle Products by methods to prevent soiling or damage to Products or packaging.
- C. Store Products in accord with manufacturer's instructions, with seals and labels intact and legible.
 - 1. Store Products subject to damage by the elements in weathertight enclosures.
 - 2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
- D. Exterior Storage:
 - 1. Store fabricated products above the ground, on blocking or skid, to prevent soiling or staining. Cover products subject to deterioration with impervious sheet coverings to provide adequate ventilation to avoid condensation.
 - 2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
- E. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure the Products are maintained under specified conditions and free from damage or deterioration.
- F. Protection After Installation: Provide substantial coverings as necessary to protect installed Products from damage from traffic and subsequent construction operations. Remove when no longer needed.

1.04 SUBMITTALS

- A. Unless noted otherwise in the Specifications, for a period of 10 days after Contract Date, Owner's Representative will consider written requests from Contractor for substitution of products specified as "or equal." For substitution requests for products specified as "or equal" in the construction documents received prior to 10 days before the Bid Date, the Owner's Representative will review and respond in writing to all Bidders concerning the products acceptability.
- B. The Owner's Representative will consider substitution requests for products specifically identified by manufacturer, name, and/or catalog number in the construction documents included with the bid.
- C. The Bidder shall submit a separate substitution request for each product, supported with complete data, with drawings and samples as appropriate, including (as applicable):
 - 1. Complete description of the product, equipment, system, process, or function.
 - 2. Complete list of system components and dimensional and weight information on separate components and assemblies.
 - 3. Drawings, catalog information and cuts.
 - 4. Manufacturer's specifications, including materials, description and paint system.

5. Performance data and pump curves.
6. Horsepower and efficiency of all motors supplied.
7. Outside utility requirements for each component.
8. List of parameters controlled, monitored, or alarmed.
9. Addresses and phone numbers for the nearest parts warehouse capable of providing full parts replacements and/or repair services.
10. Addresses and phone numbers of nearest service centers and a listing of manufacturer's representative's services available at these locations.
11. List of the three most recent installations where similar products by the manufacturer or manufacturer's representative are currently in service; include contact name, telephone number, mailing address, and the names of the engineer, owner, and installing contractor. If three installations do not exist, the list should include all that do exist, if any.
12. Comparison of the qualities of the proposed substitution with that specified.
13. Detailed information on structural, electrical, mechanical, and all other changes or modifications necessary to adapt the product to the arrangement shown and/or functions described on the contract documents.
14. Any additional space requirements necessary to provide the minimum clear space around the product as shown.
15. Submittal requirements specified herein in the individual product specifications.
16. Effect on the construction schedule.
17. Any required license fees or royalties.
18. Availability of maintenance service, and source of replacement materials.

1.05 RESPONSIBILITY FOR ADHERING TO MANUFACTURER'S INSTRUCTIONS

- A. When Contract Documents require the installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to Owner's Representative.
 1. Maintain one set of complete instructions at the job site during installation and until completion.
 2. Keep digital copies available for distribution in PDF format.
- B. Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformance with specified requirements.
 1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Owner's Representative for further instructions immediately.
 2. Do not proceed with work without clear instructions from the Owner's Representative.
- C. Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

PART 2 PRODUCTS

2.01 PRODUCT OPTIONS

A. Products List:

Within 10 days after Contract Date or as indicated in the specifications, whichever is less, submit to Owner's Representative a complete list of major products proposed to be used, with the name of the manufacturer and the installing subcontractor.

B. Contractor's Options:

1. For Products specified only by reference standard, select any product meeting the standard.
2. For Products specified by naming several products or manufacturers, select any one of the products or manufacturers named complying with the specifications.
3. For Products specified by naming one or more Products or manufacturers and "or equal", Contractor must submit a request for substitutions for any Product or manufacturer not specifically named.
4. For Products specifically identified herein by a manufacturer's name, model, or catalog number and the words "or equal" or "or approved equal" do not follow the manufacturer's name, only such items may be used in the Base Bid, except as hereinafter provided:
 - a. Products of the Contractor's choice may be offered as substitutions to such specified products, either in the spaces provided for same in the Bid form or, if no space is provided, on the Bidder's letterhead attached to each copy of the Bid Form.
 - b. Substitute products must be accompanied by full descriptive and technical data for products proposed, together with statement of amount of cost addition or deduction from the base bid if alternate is accepted.
 - c. The Contractor must judge the substitute product is of comparable character to the specified item. Unless otherwise specified within this division, the Owner's Representative will not approve or disapprove any substitute products before the bids are opened.
 - d. Any changes to other trades as a result of the use of substitute products will be the responsibility of the Contractor submitting these products. The Bidder shall include in his bid all additional construction and re-design costs associated with that substitute product including but not limited to mechanical, electrical, plumbing, fire protection, civil, architectural, structural, and instrumentation changes.
 - e. In the event the Owner's Representative does not allow the product for use as a substitute, then the product item as specified shall be furnished for the amount indicated in the Base Bid.
 - f. It is the Contractor's responsibility to show all work in design parameters to prove product substitution is equal or superior than specified.

- g. In the event the Owner's Representative allows the product for use as a substitute, the proposed substitute product shall be furnished and the Base Bid shall be adjusted accordingly.

2.02 PRODUCT SUBSTITUTIONS

A. General:

1. Allowance of substitute products does not constitute a waiver of the specifications.
2. Substitute products may be deemed equal provided the "equal" product is the same or better than the product specified in function, performance, reliability, quality, and general configuration.
3. Determination of "equal" in reference to the project design requirements will be made solely by the Owner's Representative.
4. No substitute equipment will be considered unless, in the opinion of the Owner's Representative, it conforms to the Contract Drawings and Specifications in all respects, except for make, manufacturer and minor details.
5. Should the Bidder propose substitute products, he shall notify the Owner's Representative in writing, after the award of the contract and prior to initiating construction, of all dimensional, mechanical, electrical, instrumentation, and structural changes and/or requirements for the substitute product, including relationships between the substitute product and other products or facilities and shall reimburse the Owner's Representative through the Owner for any associated redesign and/or construction drawings or specifications modifications.
6. Reimbursement for the Engineer's redesign work and any other costs resulting from substitutions shall be at the Contractor's expense.

B. Contractor's Representations:

A request for a substitution represents the Contractor:

1. Has investigated the proposed Product and determined it is equal to or superior in all respects to that specified.
2. Will provide the same warranties or bonds for the substitution as for the Product specified.
3. Will coordinate the installation of an accepted substitution into the work, and make such other changes, as may be required, to make the work complete in all respects.
4. Waives all claims for additional cost, under his responsibility, which may subsequently become apparent.

C. Owner's Representative will review requests for substitutions with reasonable promptness, and notify Contractor, in writing, of the decision to accept or reject the requested substitution.

PART 3 EXECUTION

(Not Used)

END OF SECTION

**SECTION 01700
PROJECT CLOSEOUT**

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Comply with requirements for administrative procedures stated in this Section and as required of the Contract Documents in closing out the Work. Closeout procedures are summarized in this Section.

1.02 RELATED SECTIONS

- A. Conditions of the Contract, fiscal provisions, legal submittals and additional administrative requirements.

1.03 QUALIFICATIONS AND REQUIREMENTS

- A. Contract requirements shall be met when assessment work orders and related activities have successfully produced, in order, completion of these three closeout stages:
 - 1. Substantial Completion
 - 2. Final Completion
 - 3. Final Payment Agreement
- B. The Contractor shall provide all written notices and supporting documentation as described below when requesting Substantial Completion and Final Completion, respectively. Partial submittals of the required documents shall not represent a valid request, and the Program Manager shall not be liable for any delays in the Substantial and Final Completion dates arising there from.

1.04 SUBMITTALS

The Contractor shall provide to the Program Manager the following documents, in PDF and hard copy, in the quantity of one original and two copies unless otherwise noted. Note, with the exception of Subparagraphs G, H, and I below, the submittal for approval shall have already been made prior to Substantial Completion. Submittal under this Paragraph would be for a final submittal should revisions or additional copies be required of previously submitted documentation.

- A. Evidence of Compliance with all requirements of governing authorities:
 - 1. Evidence of Compliance with all requirements of governing authorities to include Certificates of Inspection.
- B. Assessment record documents (reports, final data, etc.), as required of the Contract Documents.

- C. **Subcontractor List:** A complete listing of all subcontractors and their suppliers, indicating business addresses, telephone numbers, contact names, and items supplied by each.
- D. **Manufacturer List:** A listing of manufacturers of major materials, equipment and systems installed in the Work, and local contact addresses and phone numbers.
- E. **Warranties:** All warranties transferred to the County.
- F. **Payment of Debts and Claims and Consent of Surety:** The Contractor shall submit adequate evidence the Contractor has paid all obligations to date arising out of the Contract. Contractor shall also submit written consent of its Surety to final payment.
- G. **Release of Claims and Liens:** The Contractor and each subcontractor shall also submit a certified Release of Claims and Liens, indicating the releases for waivers submitted are complete to the best of its knowledge and information upon receipt of final payment. Example form attached.
- H. Certificate of Insurance for Products and Complete Operations.
- I. No partial submittals of the above items are to be made to the Program Manager. All items of each category are to be collected by the Contractor and delivered at one time to the County, together with a letter of transmittal listing all items. Where items are to be delivered to the Program Manager or the County's Representative, the Contractor shall include a copy of the transmittal letter listing all enclosures, signed by the respective representative acknowledging receipt.
- J. Record Drawings
- K. Consent of Surety to Final Payment: As required in General Conditions
- L. Releases from Agreements
- M. Final Application for Payment
- N. Extra Materials/Spare Parts: As required by individual Specification sections

1.05 REINSPECTION FEES

- A. When the Program Manager performs re-inspections due to failure of the work to comply with the claims of status of completion made by the Contractor:
 - 1. The County will compensate Program Manager for such additional services.
 - 2. The County will deduct the amount of such compensation from the Final Payment to the Contractor.

1.06 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the Program Manager.
- B. Statement shall reflect all adjustments to the Contract Price:
 - 1. The original Contract Price.
 - 2. Additions and deductions resulting from:
 - a. Previous Change Orders.

- b. Allowances.
 - c. Unit Prices.
 - d. Deductions for uncorrected work.
 - e. Penalties and Bonuses.
 - f. Deductions for liquidated damages.
 - g. Deductions for re-inspection payments.
 - h. Other adjustments.
3. Total Contract Price as adjusted.
 4. Previous payments.
 5. Sum remaining due.
- C. Program Manager will prepare a final Change Order reflecting approved adjustments to the Contract Price not previously made by Change Orders.

1.07 APPLICATION FOR PAYMENT

- A. Contractor shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

3.01 SUBSTANTIAL COMPLETION

- A. Reference the Definitions, regarding Substantial Completion.
- B. When the Work is substantially complete, the Contractor shall submit to the Program Manager:
1. A written notice the Work, or designated portion thereof, is substantially complete.
 2. An original Certificate of Occupancy for the Project (as applicable).
 3. A list of items to be completed or corrected (hereinafter referred to as a "Punch List").
 4. All executed work orders signed and accepted by the Program Manager.
 5. Project closeout documents, warranties, and certificates for review and approval.
- C. Within 10 business days of such notice, the Contractor and Program Manager will make an inspection to determine the status of completion.
- D. The Punch List submitted by the Contractor will be reviewed in detail, with items added or deleted to indicate Work to be corrected or completed.
1. The Program Manager reserves the right to issue a revised Punch List based on Contract Documents.

2. The Program Manager will reproduce and distribute all necessary copies of any revised Punch List to the Contractor and ensure the items requiring correction or completion are given prompt attention by the Contractor.
 3. The Program Manager may withhold the issuance of the Certificate of Substantial Completion until corrections required by said Punch List are made or all parties are satisfied they will be made.
- E. Should the Program Manager determine the Work is not substantially complete:
1. The Program Manager will promptly notify the Contractor in writing, giving the reasons therefore.
 2. The Contractor shall remedy the deficiencies in the Work, and then send a second written notice of Substantial Completion to the Program Manager.
- F. When the Program Manager concurs the Work is substantially complete, the Program Manager will:
1. Prepare a Certificate of Substantial Completion accompanied by the Contractor's Punch List of items to be completed or corrected, as verified and amended by the Program Manager. (Note: Contract responsibilities are not altered by inclusion or omission of required Work for the Punch List.)
 2. Sign the Certificate of Substantial Completion and submit it to the County and the Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

3.02 FINAL COMPLETION

- A. Reference the Definitions, regarding Final Completion.
- B. To attain Final Completion, the Contractor shall complete the activities pertaining to the Certificate of Substantial Completion and complete work on all Punch List items. Only then shall a written request to the Program Manager for final inspection be submitted.
- C. When the Work is complete, the Contractor shall submit to the County written certification, signed jointly by the Program Manager, that:
1. The Contract Documents have been complied with in their entirety.
 2. The Work has been inspected for compliance with Contract Documents.
 3. The Work has been completed in accordance with Contract Documents.
 4. The Work is completed and ready for final inspection.
- D. The Contractor and Program Manager will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
- E. Should the Program Manager determine the Work is incomplete or defective:
1. The Program Manager will promptly notify the Contractor in writing, listing the incomplete or defective Work.

2. The Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to the County stating the Work is complete.
- F. When the Program Manager finds the Work is acceptable under the Contract Documents, the Contractor will be requested to make a final closeout submittal.

END OF SECTION

**UNCONDITIONAL WAIVER AND RELEASE
UPON FINAL PAYMENT**

STATE OF GEORGIA

DEKALB COUNTY

The undersigned mechanic and/or materialman has been employed by _____ (name of contractor) to furnish _____ (describe materials and/or labor) for the construction of improvements known as _____ (title of the project or building) which is located in the City of _____, City of _____, and is owned by _____ (name of owner) and more particularly described as follows:

(DESCRIBE THE PROPERTY UPON WHICH THE IMPROVEMENTS WERE MADE BY USING EITHER A METES AND BOUNDS DESCRIPTION, THE LAND LOT DISTRICT, BLOCK AND LOT NUMBER, OR STREET ADDRESS OF THE PROJECT.)

Upon the receipt of the sum of \$ _____, the mechanic and/or materialman waives and releases any and all liens or claims of liens or any right against any labor and/or material bond it has upon the foregoing described property.

Given under hand and seal this _____ day of _____, 20__.

(Seal)

(Witness)

Consent Decree – Major Gravity Sewer Line Capacity Restoration

UNCONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT
PROJECT CLOSEOUT
01700 - 7

SECTION 01710
CLEAN-UP

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This section includes policies and procedures preventing the accumulation of waste materials on the site and the clean-up of waste materials thereof, throughout the duration and upon the completion of work.
- B. This section includes miscellaneous work related to quality control including, but not limited to, protecting active utilities, procedures for utility crossings, and relocating existing gas lines.
- C. This section includes operations not specified in detail as separate items, but can be sufficiently described as to the kind and extent of work involved. Furnish all labor, materials, equipment and incidentals to complete the work under this Section.

1.02 RELATED SECTIONS

- A. Section 02110: Easement Access and Clearing
- B. Section 02276: Site Restoration and Erosion Control

1.03 QUALIFICATIONS AND REQUIREMENTS

- A. Contractor shall keep the project site free from accumulated waste materials and rubbish at all times during the assessment period. At completion of the work, the Contractor shall remove all waste materials and rubbish from and about the Project, as well as his tools, equipment, machinery, and surplus materials, except those specifically required by the Contract Documents to be left for the County's maintenance.
- B. If Contractor fails to keep project clean or to clean up prior to Date of Substantial Completion, the County may do so, and the cost thereof will be charged to the Contractor.
- C. Attention is directed to the State Soil Erosion and Sediment Control laws, ordinances and requirements, as well as Georgia's NPDES Permit No. GAR 100001, 100002, or 100003, as applicable, and as detailed in the drawings, or addressed in other sections.
- D. Reference Section 01030 as related to Sewage waste disposal, handling, and spill prevention, containment and mitigation.

1.04 SAFETY

- A. Store volatile waste in covered metal containers or as required by State and Federal requirements, and remove from project site daily to an approved facility.
 - 1. Allow no volatile wastes to accumulate on project site.

2. Provide adequate ventilation during use of volatile substances.
- B. Do not burn or bury waste materials and/or rubbish on project site.
 - C. Do not dispose any volatile wastes such as, but not limited to, mineral spirits, oil, or paint thinner in storm or sanitary drains, on pavements, in gutters, or on project site.
 - D. Do not dispose any waste or cleaning materials containing materials harmful to plant growth on project site. Clean up materials accidentally spilled as quickly as possible.

PART 2 – PRODUCTS

2.01 MATERIALS

Materials required for this section shall be of the same quality as materials to be restored. Where possible, reuse existing materials previously removed.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Clean-up during construction
 1. Execute cleaning procedures to ensure the building, project site and adjacent properties are maintained free from debris, dust, and rubbish.
 2. Wet down materials subject to blowing. Do not throw waste materials from heights.
 3. Provide covered, on-site containers for waste collection. Place all waste materials and rubbish in containers in an expeditious manner to prevent accumulation. Remove waste from project site when containers become full.
 4. Legally dispose all waste materials, rubbish, volatile materials and cleaning materials off project site.
 5. When finishing work begins, maintain project in a "broom-clean" state until Date of Substantial Completion. Protect newly finished and clean surfaces from contamination during cleaning operations.
 6. Do not allow debris contributing to the survival or spread of rodents, roaches or other pests to accumulate.
 - a. Remove debris containing food scraps on a daily basis.
 - b. Should pests inhabit project, Contractor shall be responsible for securing services of a pest exterminator at no additional cost to the County.
- B. Protection and clean-up of roads
 1. Spillovers on roads from trucks entering or leaving the site shall be cleaned up on a continuing basis so pavements and adjacent sidewalks will not be littered with earth, stones, or any other debris resulting from assessment operations.
 2. Large accumulations of earth and mud shall be removed from vehicle wheels and loose accumulations of earth, sand or gravel shall be

removed from vehicle underbodies and ledges as much as feasible before entry upon public roads.

C. Stripping

In areas so designated, topsoil shall be stockpiled. The topsoil shall be protected until it is placed as specified. Any topsoil remaining after all work is in place shall be used on-site in designated areas.

D. Benchmarks

Carefully maintain all benchmarks, monuments, and other reference points. If disturbed, replace as directed by the Program Manager.

E. Incidental work

Do all incidental work not otherwise specified, but obviously necessary, for the proper completion of the contract as specified.

3.02 ACTIVE UTILITIES

A. Active utilities traversing the site shall be adequately protected and preserved in operating condition. Repair damage to all such utilities due to work under this Contract, to the satisfaction of the authority having jurisdiction over the utility at no additional cost to the Owner. If damaged, tracer wires and marking materials shall be restored, repaired or replaced as necessary, to the satisfaction of the authority having jurisdiction over a utility.

B. Disconnect or arrange the disconnection of utility service in accordance with regulations of the governing utility concerned and interfering with the work.

C. Crossing Utilities:

This item shall include any extra work required in crossing culverts, water courses, or drains, including all sheeting and bracing, extra excavation and backfill, or any other work required for the crossing, whether or not shown on the drawings. In no case shall there be less than 0.3 feet between any two pipelines and structures. Special requirements from the authority having jurisdiction over a utility for such things as maintenance clearance or clearance related to cathodic protection shall be complied with. Refer to DeKalb County Department of Watershed Management Design Standards.

D. Relocating Existing Gas Lines:

Notify the proper utility authority involved when relocating gas lines is required. Coordinate all work and required permits by the utility so assessment progress will not be hampered.

3.03 FINAL CLEAN-UP

- A. All general and specific cleaning shall be performed prior to Contractor's request the project or portion thereof be inspected for Substantial Completion.
- B. Clean disturbed areas of project site of debris.
 - 1. Broom clean paved surfaces.
 - 2. Rake clean all landscaped surfaces.
 - 3. Remove oil and similar deleterious substances.

END OF SECTION

SECTION 01720
RECORD DOCUMENTS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This section includes, but is not limited to, the compiling, maintaining, recording and submitting of project record documents as herein specified.
- B. Record Documents include, but are not limited to:
 - 1. Drawings,
 - 2. Photographs of buried conditions and changes
 - 3. Sketches
 - 4. Specifications
 - 5. Test records
 - 6. Printed and digital PDF map marked ups illustrating changes to the map.
 - 7. Contract changes including field orders, change orders, RFI's etc.

1.02 RELATED SECTIONS

- A. Section 01700: Project Closeout

1.03 QUALIFICATIONS AND REQUIREMENTS

- A. Unless noted otherwise, Record Drawings shall provide dimensions, distances and material type.
- B. Unless noted otherwise, Record Drawings shall provide elevations to the nearest 0.01 for all pertinent items constructed by Contractor.
- C. The Contractor shall maintain on the project site, throughout the Contract Time, an up-to-date set of Record Drawings. The Record Drawings are subject to review each month by the Program Manager, and shall be made available on demand.
- D. Upon completion of the project, the Program Manager shall correct the original bid/contract plans and specifications, to include the Record Drawings and corrected specifications provided by the Contractor at the completion of the work. Change Orders, Addenda, Field Orders, negotiated changes, substitutions, final products list, etc. shall document the project as finally constructed. The corrections may be made by “clouding” and referencing other material on additional drawing sheets or specification pages. Failure to provide a complete and compliant set of Record Drawings at project close out will be cause for withholding Final Payment, regardless of the Program Manager’s periodic reviews
- E. All drawings shall be conspicuously identified as “Record Documents” (per 3.1.A) in the lower right corner of all sheets. Specifications may be identified on the cover and via the “Footer” on each page.

1.04 SUBMITTALS

- A. At contract closeout, and prior to requesting final payment, deliver Record Documents to the Program Manger for the Owner. Allow for sufficient time for review.
- B. Accompany Submittal with transmittal letter, in duplicate, containing:
 - 1. Date
 - 2. Project title and number
 - 3. Contractor's name and address
 - 4. Title and number of each record document
 - 5. Signature of Contractor or Contractor's authorized representative
- C. The digital media (CD or DVD) label is to include the project's County ID Number, project name and location, the Owning Agency's name, the Designer's name, the Contractor's name, and the format of files (.gdb, .pdf or .dwg or acceptable CAD format). All file names on the digital media should correlate with actual sheet numbers of the drawings. Both the sleeve and the disk are to be to be labeled.
- D. Contractor shall add to the digital PDF(s) all changes to the map or drawing based upon actual field conditions. Contractor shall submit marked up map(s) or drawing(s) showing the position of unmapped and incorrectly positioned or added manhole(s) and/or pipelines discovered or installed during the investigation or construction. Map(s) or drawing(s) shall be marked up in red and delivered to the Owner's Representative on the completion of each project. Additionally, supplemental sketches also marked up in red ink, shall be provided as necessary, to clearly depict the actual site conditions. Contractor shall also show all point repairs, access roads and raised manholes. A legend shall be added to the title block indicating the symbology, color coding (should be required to be as follows: red-additions, green- deletions, blue-notes) and descriptions. The date, the words "Record Drawing" and company name shall also be added to the title block.
- E. Record Drawings Plan Submittal
 - 1. The following Datum shall be used:
 - a. Vertical: NAVD 88
 - b. Horizontal: NAD 83 (modified to ground). Conversion factor shall be provided to convert back to State Plane (grid)
 - 2. There are 2 STEPS to follow in order to complete the Record Drawings:
 - a. Step 1 – Draft Plan Submittal and Review
 - 1) Upon completion of the work at each location receiving rehabilitation and/or replacement, the marked set of construction plans (Contractor redlines) and a copy of the certified Field Survey Notes obtained from the surveyor's record collection points shall be furnished to the Project
 - 2) Engineer. The Contractor shall prepare a draft version of the Record Drawings for Program Manager's review.
 - 3) The following items shall be included as part of the Submittal:

- a) Certified Field Survey Notes – if in electronic format, points shall clearly identify the feature being referenced
 - b) Contractor redlines
 - c) Draft Surveyed Record Drawings submitted for review including the following:
 - 4) Every sheet shall be stamped “Surveyed Record Drawing”.
 - 5) Engineer Certification – every sheet shall be attested to and sealed by a Georgia Registered Engineer (signature required only on final submittal).
 - 6) Surveyor Certification – this shall be provided, as a minimum, on the cover sheet (signature required only on final submittal).
 - 7) Surveyed Northings and Eastings (N/Es) shall be updated and noted – update N/Es by striking through original N/Es and adding actual N/Es.
 - 8) CAD files shall reflect the actual physical location of the updated N/Es by moving valves, manholes, etc. to their new locations.
 - 9) Pipe inverts, pipe lengths, pipe slopes, pipe fittings, etc. (including hydraulic calculations on the plans) shall be updated by striking through original data and adding actual data.
 - 10) Plans shall indicate whether rims were surveyed prior to, or after final lift of paving.
 - 11) The following construction information shall be added to the Cover Sheet:
 - a) Date Installed:
 - b) Contractor:
 - c) Owner Field Representative:
 - d) Owner/Developer:
 - e) Project Engineer:
 - f) Soils Engineer:
 - g) Surveyor:
- b. Step 2 – Final Plan Submittal
- 1) Following Program Manager’s review of the last draft submittal, the Contractor will then prepare the final submittal package based on Program Manager’s review comments and submit to Owner. The final submittal package shall include the following items:
 - a) Two bound and signed, half-sized print sets (11” x 17”), a disc containing both electronic files (latest version of AutoCAD), and .pdf files
 - b) Electronic drawings shall include appropriate line types/styles per Owner’s CAD Standards.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Storage:
 - 1. Store documents and samples in the Contractor's field office, apart from documents used for construction.
 - 2. Provide files and racks for storage of documents.
- B. Maintenance:
 - 1. Maintain documents in a clean, dry, legible condition and in good order.
 - 2. Maintain at the site for the Owner's Representative, one copy of all record documents.
- C. Make documents and samples available at all times for inspection by Owner's Representative.
- D. Failure to maintain the Record Documents in a satisfactory manner will be cause for withholding of a certificate for payment.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

3.01 RECORDING

- A. Label each document "RECORD DOCUMENTS" in neat, large printed letters.
- B. Recording:
 - 1. Record information concurrently with construction progress.
 - 2. Do not conceal any work until required information is recorded.

3.02 RECORD DRAWINGS

- A. Surveyed Record Drawings of the project shall be submitted for review and approval as a condition for project Acceptance, and subsequently a condition of releasing the project for Final Completion.
- B. Record Drawings shall be reproducible, shall have a title block indicating the drawings are "RECORD DOCUMENTS" the name of the company preparing the Record Drawings, and the date the Record Drawings were prepared.
- C. One full set of specifications and drawings shall be saved in Adobe Acrobat (.pdf) format both scanned and original plot from AutoCAD to allow for clarity in viewing, and one full set on a separate CD or DVD saved in a ArcGIS geodatabase (.gdb) or (.dwg) format such as AutoCAD or a similar system no newer than the current operating version of the Owner's capabilities. The digital media disk shall be labeled with the project's County ID number, project name and location, the Owning Agency's name, the Designer's name and the format of files included in CD. *Note: One paper copy of the

Record drawings and specifications with Designers and Surveyors seals shall be provided for the Owner's use and archiving.

- D. Legibly mark drawings to record actual construction, including:
1. All Construction:
 - a. Changes of dimension and detail
 - b. Changes made by Requests for Information (RFI), field order, clarification memorandums or by change order
 - c. Details not on original Drawings
 - d. Exact direction and location of existing and new utilities where field location varies from GIS drawing or other information provided by the Owner for the project.
 2. Site Improvements, Including Underground Utilities:
 - a. Horizontal and vertical locations of all exposed and underground utilities and appurtenances, both new facilities constructed, and those utilities encountered, referenced (by triangulation) to permanent surface improvements.
 - b. Location and dimensions of roadways and parking areas, providing dimensions to back of curb when present.
 - c. The locations shall be referenced to at least two easily identifiable, permanent landmarks (e.g., power poles, valve markers, etc.) or benchmarks.
 - d. The Record Drawings shall include the horizontal angle and distance between manhole covers.
 3. Structures:
 - a. Depths and locations of various elements of foundation in relation to finish first floor datum or top of wall.
 - b. Location and elevation of internal and buried utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

3.03 SPECIFICATIONS

- A. Legibly mark each section to record:
1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
 2. Changes made by RFI, field order, clarification memorandums, or by change order.

END OF SECTION

SECTION 02010
SUBSURFACE CONDITIONS

PART 1 – GENERAL

1.01 SECTION INCLUDES

This section includes general guidelines for the treatment of subsurface conditions, including, but not limited to, the excavation and handling of all subsurface materials and conditions included in the contract work.

- A. It is understood and agreed the Contractor has made or will make a thorough investigation of the surface and subsurface conditions of the site and any special construction problems potentially arising from nearby watercourses and floodplains, particularly in areas where construction activities may encounter water bearing sands, soils, and gravels or limestone solution channels.

1.02 RELATED SECTIONS AND DOCUMENTS

- A. General Requirements of the Agreement and Division 1 Specification Sections apply to this Section.
- B. Division 2: Site Work

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Excavation to required subgrade elevations is unclassified and no classification of excavated materials will be made. Excavation work shall include the removal and subsequent handling of all materials excavated or otherwise removed in performance of the contract work, regardless of the type, character, composition, obstructions encountered, or condition thereof.
- B. The Contractor shall be responsible for providing all services, labor, equipment, and materials necessary or convenient for completing the work within the time specified in these Contract Documents.
- C. The Contractor shall perform all excavations of every description, and of whatever substances encountered, to the dimensions and levels shown on the Drawings and/or as required to complete the Work as specified.
- D. The Contractor shall satisfy himself as to rock and other materials potentially encountered in excavation and make proper allowances for all contingencies in his lump sum or unit price bid. The Program Manager will not be responsible for subsurface conditions found.

END OF SECTION

SECTION 02110
ACCESS ROUTE & EASEMENT ACCESS CLEARING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This section includes, but is not limited to, removing and disposing of trees, stumps, roots, brush, structures, abandoned utilities, trash, debris, and all other materials found on or near the surface of the ground in the construction area and, understood by generally accepted engineering practice, not to be suitable for construction of the type contemplated from the work site. Precautionary measures to prevent damage to existing features to remain are considered part of the work.
- B. The Program Manager will designate all trees, shrubs, plants, and other things to remain. Trees, shrubs, plants adjacent to clearing areas shall have protection fence installed prior to the beginning of clearing. Paint required for cut or scarred surface of trees or shrubs selected for retention shall be an asphaltum base paint prepared especially for tree surgery and approved by the Program Manager.
- C. Sewer Easement Clearing Operations shall be coordinated with temporary and permanent erosion and sedimentation control procedures.

1.02 RELATED SECTIONS

- A. Section 01015 – Control of Work
- B. Section 02276 – Site Restoration and Erosion Control
- C. Section 02485 – Sodding
- D. Section 02486 – Seeding
- E. Section 02542 – Silt Fence

1.03 DEFINITIONS

- A. **Light Clearing:** This area requires "bush hog" equipment for tree and shrub removal.
- B. **Medium Clearing:** This area requires "bush hog" and "chipper" equipment for tree and shrub removal.
- C. **Heavy Clearing:** This area requires "timbering" equipment for tree and shrub material. Payment under this section shall be by the sum total caliper inch measured for each tree removed.

1.04 QUALIFICATIONS AND REQUIREMENTS

- A. The Contractor shall comply with all applicable codes, ordinances, rules, regulations, and laws of local, municipal, State or Federal authorities having jurisdiction over the

work. All required permits shall be obtained for construction operations by the Contractor and submitted to Program Manager for verification.

- B. All persons involved in land disturbance work shall be trained and certified in accordance with the requirements of the Georgia Erosion and Sedimentation Act.
- C. Contractor shall provide the services of qualified personnel for measuring tree caliper and defining species of plantings to be removed and replaced.
- D. Open burning will not be permitted.

1.05 SUBMITTALS

- A. Prior to beginning easement clearing, the Contractor shall submit to the Program Manager a map showing the location of all easements to be cleared. The Contractor shall label each easement as requiring light clearing, medium clearing or heavy clearing.
- B. The Contractor shall submit to the Program Manager a schedule for clearing the easements.
- C. The easement clearing map and schedule must be submitted to the Program Manager fourteen (14) calendar days prior to beginning easement clearing.
- D. The easement clearing map and schedule must be approved by the Program Manager before the Contractor can begin work.
- E. Copies of all permits required for clearing operations shall be provided to the Program Manager prior to beginning work.
- F. Equipment list and specification for all pieces planned for use on site.
- G. Maintenance log of equipment to be used to show that all equipment has been properly maintained.
- H. Plan for approved fuel storage areas if applicable.

PART 2 – PRODUCTS

2.01 EQUIPMENT

- A. The Contractor shall furnish equipment with operators of the type normally used in clearing and grubbing operations including, but not limited to tractors, trucks, loaders, stump grinders, and root rakes.

PART 3 – EXECUTION

3.01 INSTALLATION AND EXECUTION

- A. Clearing and grubbing activities will be conducted at the minimum level necessary to provide access to an assessment or construction activity location.
- B. Use of explosives for clearing is not permitted. Clear and grub the permanent easement, but not to exceed limits of easements on each side of the pipeline, before

initiating other items of work. Remove all trees, growth, debris, stumps and other objectionable matter, except as directed by the Program Manager.

- C. Materials to be cleared, grubbed and removed from the construction area include, but are not limited to the following: trees, stumps, roots, brush, trash, organic matter, paving, miscellaneous structures, debris, and abandoned utilities.
- D. Grubbing shall consist of completely removing roots, stumps, trash, and other debris from all graded areas so the topsoil is free of roots and debris. Topsoil is to be left sufficiently clean so further picking and raking will not be required. Grubbing shall only be performed at the specific direction of the Program Manager.
- E. All stumps, roots, foundations and planking embedded in the ground shall be removed and disposed of in a proper manner. Piling and butts of utility poles shall be removed to a minimum depth of two feet below the limits of excavation for structures, trenches and roadways or two feet below finished grade, whichever is lower.
- F. 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 on the easement clearing maps and shall be reviewed with the Program Manager. The Program Manager will determine which landscape features are to remain undisturbed. The Contractor shall take extreme care in moving landscape features and shall re-establish these features as directed by the Program Manager. The contractor shall also photographically document these features prior to disturbance or clearing. This documentation shall be sufficient in detail to confirm the condition and location of all features.
- G. Surface rocks and boulders shall be grubbed from the soil and removed from the site, if not suitable as rip rap.
- H. Where tree limbs interfere with utility wires, or where the trees to be felled are in close proximity to utility wires, the tree shall be taken down in sections to eliminate the possibility of damage to the utility.
- I. Any work pertaining to utility poles shall comply with the requirements of the appropriate utility. All activities shall be coordinated with the utility owner.
- J. 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 Program Manager's opinion, significantly damaged shall be replaced with new fence material of equal or better quality at the Contractor's expense.
- K. Stumps and roots shall be grubbed and removed to a depth not less than 2 feet below grade. All holes or cavities extended below the subgrade elevation of the proposed work shall be filled with crushed rock or other suitable material, compacted to the same density as surrounding material.
- L. The Contractor shall exercise special precautions for the protection and preservation of trees, cultivated shrubs, sod, fences, etc. situated within limits of the construction area, but not directly within excavation and/or fill limits. The Contractor shall be held liable for any damage his operations have inflicted on such property.

- M. The Contractor shall be responsible for all damages to existing improvements outside the permanent easement resulting from Contractor's operations.
- N. Burying of residual materials will not be allowed.

3.02 CONSTRUCTION ACCESS ROUTE ON EASEMENT

- A. When directed by the Program Manager, a construction access route shall be built for the purpose of accessing manholes and performing all other necessary work within the easement.
- B. Construction access exit/entrance shall be cut not less than twenty (20) feet wide and fifty (50) long, minimum, and six (6) inches deep below existing grade. Filter fabric shall be placed at the bottom of the cut, and stone shall be placed on top of the fabric, filling the six-inch depth along the road.
- C. Construction roads, when required, shall be cut ten (10) feet wide and as long as needed and six (6) inches deep below existing grade, or as directed by the Program Manager. Filter fabric shall be placed at the bottom of the cut, and stone shall be placed on top of the fabric, filling the six (6) inch depth along the road.
- D. Provide and install the filter fabric and stone as indicated in the Manual for Erosion and Sediment Control in Georgia.
- E. The Contractor is required to maintain the exit/entrance and access roadway to include periodic top dressing of gravel to maintain a six (6) inch depth. Remove all spilled materials and debris from graveled surfaces.
- F. During heavy clearing the diameters of all timber trees to be removed shall be measured in caliper inches in order to get paid. The Program Manager should be notified of this occurrence so inspection can be provided to monitor the measurements.

3.03 CLEAN-UP

- A. The debris resulting from the clearing and grubbing operation shall be hauled to a disposal site secured by the Contractor and shall be disposed of in accordance with all requirements of Federal, State, County and municipal regulations. No debris of any kind shall be deposited in any stream or body of water, or in any street or alley. No debris shall be deposited upon any private property, except with written consent of the property owner. In no case shall any material or debris be left on the worksite, shoved onto abutting private properties, or buried on the worksite.
- B. Open burning will not be permitted.

END OF SECTION

SECTION 02205
DEWATERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Protection of Resources.
- B. Excavation/Trench Dewatering.
- C. Stream and Surface Water Diversion.
- D. Disposal of Water Removed from Excavations and Trenches.

1.02 RELATED SECTIONS

- A. Section 02324 - Trenching and Trench Backfilling

1.03 REFERENCES

Occupational Safety and Health Administration (OSHA) Regulations.

1.04 SCOPE

- A. This section specifies the control, handling, and disposal of groundwater and surface water during construction. This work includes the installation, operation, and removal of all facilities required to maintain open excavations and trenches in a dewatered condition to permit unrestricted construction operations.
- B. The Contractor shall be responsible for the stability of all temporary and permanent slopes, grades, trenches, foundations, materials, and structures during the course of the Work. The Contractor shall repair and replace all slopes, grades, foundations, materials, and structures damaged by water, both surface and subsurface, to the lines, grades, and conditions existing prior to the damage, at no additional cost to the County.
- C. The Contractor shall construct all permanent work in areas free from water. The Contractor shall design, construct, and maintain all pumping systems, dikes, levees, cofferdams, and diversion and drainage channels as necessary to maintain construction areas free from water and to protect the areas occupied by permanent work from water damage. The Contractor shall remove temporary work after it has served its purpose.

1.05 DEFINITIONS

- A. Dewatering includes lowering the water table and intercepting seepage otherwise emerging from slopes or bottoms of excavations and disposing of removed water.

- B. The intent of dewatering is to:
1. Increase stability of excavated slopes; prevent dislocation of material from slopes or bottoms of excavations;
 2. Reduce lateral loads on sheeting and bracing; improve excavating and hauling characteristics of excavated material;
 3. Prevent failure or heaving of the bottom of excavations; and
 4. Provide suitable conditions for placement of backfill materials and construction of structures and other installations.
- C. Surface drainage includes use of temporary drainage ditches and dikes and installation of temporary culverts and sump pumps with discharge lines, as required, to protect the Work from any source of surface water.

1.06 JOB CONDITIONS

A. Permits:

Prior to discharging water into a storm sewer or waterway, the Contractor shall obtain all necessary permits from the jurisdictional agencies and submit a Notice of Intent to the Georgia Environmental Protection Division by certified return receipt mail at least forty-eight (48) hours prior to conducting any land disturbance activities.

B. Responsibilities:

1. The Contractor shall select and install a system to control water as specified in this section, and to comply with the requirements of the jurisdictional agencies.
2. The Contractor shall take measures to prevent damage to properties, buildings or structures, sewers and other utility installations, pavements, sidewalks, and the Work.
3. The Contractor shall not overload or obstruct existing facilities.
4. The Contractor shall modify the dewatering system at no additional cost to the County if, after installation and while in operation, it causes or threatens to cause damage to existing buildings, structures, utilities, facilities, or other adjoining property.
5. The Contractor shall monitor the quality of the discharge from the dewatering system to determine if soil particles are being removed by the system and install and maintain settling basins as required to control particle removal.
6. The Contractor shall measure and evaluate if movements are being caused to adjacent buildings, structures, utilities, facilities, or other adjoining properties by dewatering operations.
7. The Contractor shall repair damage, disruption, or interference resulting directly or indirectly from dewatering operations at no additional cost to the County.
8. The Contractor shall submit plans and details for the protection of the Work, where applicable, to the County's Representative for approval. These plans shall include details of bulkheads, pumping facilities, dikes, and drainage.

1.07 PERFORMANCE REQUIREMENTS

- A. The Contractor shall provide a dewatering system to produce the following results:
1. Effectively reduce the hydrostatic pressure affecting excavations.
 2. Develop a substantially dry and stable subgrade for subsequent construction operations.
 3. Preclude damage to adjacent properties, buildings, structures, utilities, installed facilities, and other work.
 4. Prevent the loss of fines, seepage, boils, quick condition, or softening of the foundation strata.
 5. Maintain stability of sides and bottom of excavations.
- B. The Contractor shall provide drainage of seepage water, surface water, and water from any other source entering the excavation. Dewatering of excavations and trenches may include placement of drainage materials, such as crushed stone and filter fabric, together with sump pumping.
- C. The Contractor shall provide ditches, berms, pumps, and other methods necessary to divert and drain surface water from excavations and other Work areas.
- D. The Contractor shall locate groundwater and surface water control and dewatering systems so as not to interfere with utilities, construction operations, adjacent properties, or adjacent water wells.
- E. The Contractor shall assume sole responsibility for the dewatering system and for any loss or damage resulting from partial or complete failure of protective measures and any settlement, or resultant damage caused by the dewatering operations.
1. The Contractor shall modify dewatering system if it causes or threatens to cause damage to new construction, existing improvements within the site of the Work, adjacent properties, or adjacent water wells.
 2. The Contractor shall repair damage caused by the dewatering system or damage resulting from failure of the dewatering system to protect properties as required.

1.08 SUBMITTALS

- A. The Contractor shall submit a dewatering plan to the County's Representative prior to commencing Work. The dewatering plan shall be submitted for each site, where required, and include the following description of the proposed dewatering system indicating arrangement, location, depth, and capacities of system components, installation details, and operation and maintenance procedures will include:
1. Design calculations (if any).
 2. Standby equipment and power supply.
 3. Location and size of berms, dikes, settling basins, sumps, and discharge items.
 4. Pollution control facilities.

5. Discharge locations.
 6. Surface water control and drainage installations.
 7. Proposed methods and locations for disposing of removed water.
 8. Copies of all permits required to discharge water removed from construction areas.
 9. Positive means of monitoring groundwater elevation
 10. methods for monitoring fines in discharge water
- B. Working drawings and supporting documents shall be revised and resubmitted to the County's Representative if the dewatering system is modified during installation or during operation.

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.01 PROTECTION OF RESOURCES

Construction operations shall be planned and conducted to prevent an adverse impact on streams, lakes, and reservoirs with sediment or other harmful material used in the construction of the project. The Contractor shall comply with all regulations of the Environmental Protection Agency (EPA), the Georgia Department of Natural Resources, Environmental Protection Division (EPD), and the Georgia Department of Transportation (GDOT).

3.02 EXCAVATIONS/TRENCH DEWATERING

- A. Dewatering shall include removal of all liquid, regardless of source, from excavations and trenches. The Contractor shall provide an adequate dewatering system capable of removing any water accumulating in excavations and trenches and maintaining the excavation and trench in a dry condition while construction is in progress. At any time, the excavated area shall be limited to the capability of the equipment or system to properly dewater the area.
- B. The Contractor shall make the effort necessary to secure a dry trench bottom before laying pipe. If, in the opinion of the County's Representative, the Contractor has failed to obtain an absolutely dry trench bottom by insufficient use of all known methods of trench dewatering, the County's Representative may order the Contractor to excavate below grade and place not less than six (6) inches of graded crushed stone fill material over the trench bottom to form French drains to suitably locate sumps and to remove the water by bailing or pumping. The graded crushed stone fill material shall be placed at the Contractor's expense, and shall be deep enough so there shall be no water in bell holes at the time of coupling the pipe.
- C. With approval of the County's Representative and the jurisdictional agency concerned, the Contractor shall provide and maintain ditches of adequate size to collect surface water and seepage entering the excavations and divert the water into

a sump to be drained or pumped into drainage channels and settling basins prior to discharge to storm sewers.

- D. The Contractor shall install all drainage ditches, sumps, and pumps to control excessive seepage on excavated slopes, to drain isolated zones with perched water tables and to drain impervious surfaces at final excavation elevation.
- E. The Contractor shall perform dewatering operations by means ensuring dry excavations, preserve final lines and grades, and not disturb or displace adjacent soil.
- F. Excavations shall be continuously dewatered to maintain a ground water level no higher than two (2) feet below the lowest point in the excavation. Dewatering shall be accomplished well enough in advance of excavation to ensure the groundwater is already lowered prior to completing the final excavation to finish subgrade.
- G. All destabilized subgrade conditions caused by inadequate or untimely dewatering operations shall be undercut and backfilled with suitable backfill material at no additional cost to the County.
- H. The Contractor shall install settling basins or other approved apparatus, as required, to control the amount of fine particles and other pollutants carried by water diverted into storm sewers or flowing off the site of the Work.
- I. Should a storm sewer become blocked or have its capacity restricted due to the dewatering operations, the Contractor shall make arrangements with the jurisdictional agency and clean the sewer and appurtenances at no additional cost to the County.
- J. The Contractor shall backfill and restore all temporary drainage ditches, sumps, and settling basins, when no longer required, with granular material, concrete, or other material as approved by the County's Representative at no additional cost to the County.

3.03 STREAM AND SURFACE WATER DIVERSION

- A. The Contractor shall use all practical means, such as ditches, berms, dikes, sand bags, hay bales, or other methods, approved by the County's Representative to prevent surface water from entering excavations. Diverting surface water shall be performed in a manner preventing the accumulation of water around structures or any other locations within the site of the Work, where it may be detrimental.
 - 1. The Contractor shall intercept and divert surface drainage away from the excavations, by the use of dikes, curb walls, ditches, pipes, sumps, or other means.
 - 2. The Contractor shall design surface drainage systems to prevent erosion, on or off the site, or cause unwanted flow of water.
 - 3. The Contractor shall remove the surface drainage system when no longer required.
 - 4. The Contractor shall remove debris and restore the site or sites to original condition.

5. Dispose of removed debris at a legally licensed facility.
- B. If stream diversion or relocation around the site of the Work is required, the Contractor shall return the stream to its original location and contours. Slopes in stream relocations shall be seeded above the waterline.

3.04 DISPOSAL OF WATER REMOVED FROM EXCAVATIONS AND TRENCHES

- A. The Contractor shall dispose of water from the Work per the regulations established by the EPA, EPD, and in a manner approved by the County's Representative.
- B. The method the Contractor uses to dispose of the water resulting from dewatering operations will not damage or interfere with the normal drainage from the Work site. In addition, the Contractor shall protect any portion of the Work completed or in progress, surfaces of streets, and private property from damage.
- C. All gutters, drains, culverts, storm sewers, and inlets around the Work shall be kept clean and open for normal surface drainage.
- D. The Contractor shall not direct water across or over pavement except by methods approved by the County's Representative. Water shall not be drained into Work under construction.
- E. Water removed from excavations and discharged into streams shall be filtered through granular material prior to pumping or through hay bales and siltation fabric after pumping, or both, if required by the County's Representative. Discharges into streams shall be conducted in accordance with regulations established by the EPA and the EPD.

END OF SECTION

SECTION 02273
RIPRAP

PART 1 – GENERAL

1.01 SECTION INCLUDES

The section includes general requirements for providing stone riprap slope protection, including associated earthwork and geotextile filter material, complete and in place, in accordance with the Contract Documents.

1.02 RELATED SECTIONS

- A. Section 01300: Submittals
- B. Section 02276: Site Restoration and Erosion Control

1.03 REFERENCED SPECIFICATIONS, CODES, AND STANDARDS

- A. This Section references the following Commercial Standards:
 - 1. Georgia Department of Transportation (GA DOT), Standard Specifications
 - 2. Construction of Roads and Bridges, 1993 Edition
 - 3. ASTM C 88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
 - 4. ASTM C 535, Standard Test Method for Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - 5. AASHTO T 85, Standard Method of Test for Specific Gravity and
 - 6. Absorption of Coarse Aggregate
 - 7. AASHTO T 210, Method of Test for Aggregate Durability Index.
 - 8. AASHTO T 134, Optimum Moisture Content

1.04 SUBMITTALS

- A. Shop Drawings: Description and location of proposed sources of riprap bedding and riprap.
- B. The Contractor shall submit samples of all materials proposed to be used in the work. Sample size shall be as determined by the testing laboratory.
- C. Testing certificates from a qualified testing agency shall be submitted prior to acceptance of the rock source to verify the gradation, abrasion resistance, and bulk density. Contractor shall, if requested, coordinate inspection of the rock source by the Program Manager.
- D. Trip tickets showing source, type, and weight of each load of material delivered to the Site.

PART 2 – PRODUCTS

2.01 STONES FOR RIPRAP

- A. All Stone for riprap shall be sound, durable pieces of quarried stone weighing 156-pounds per cubic foot or more. The stone shall be angular and random in shape; rounded boulders or cobbles shall not be used. Flat, slabby, or shaley pieces will not be acceptable. Stones shall be resistant to weathering and to water action and free from overburden, spoil, and organic material and shall meet the gradation requirements below.
- B. Riprap shall be of the type indicated on the Drawings and shall conform to the size types as follows:

Type 2 – equivalent to GA DOT specification for "Plain Riprap":

Percent by Weight	Volume (cu.ft.)	Weight (lb.)	Diameter (in)
65 - 100%	0.75-2.0	125- 320	15-24
10-65%	0.04-0.75	7-125	5 - 15
0-10%	0.0-0.04	0-7	0-15

Type 3 – equivalent to GA DOT specification for "Dumped Riprap- Type 3":

Percent by Weight	Volume (cu.ft.)	Weight (lb.)	Diameter (in.)
65-100%	0.10-1.0	7- 65	6-18
10-65%	0.01-0.1	2-17	2-6
0-10%	0.0-0.01	0 - 2	0 - 2

- C. The durability index and percent absorption shall be determined by AASHTO T 210 and AASHTO T 85, respectively. The minimum apparent specific gravity of the stones shall be 2.5 as determined by AASHTO T 85.
- D. Stones shall have less than 10 percent loss of weight after five cycles, when tested per ASTM C 88.
- E. Stones shall have a wear not greater than 40 percent, when tested per ASTM C 535.
- F. Control of gradation shall be by visual inspection. The Contractor shall furnish a sample of the proposed gradation of at least 5 tons or 10 percent of the total riprap weight, whichever is less. If approved, the sample may be incorporated into the finished riprap at a location where it can be used as a frequent reference for judging the gradation of the remainder of riprap. Any difference of opinion between the Engineer and the Contractor shall be resolved by checking the gradation of two random truckloads of stones. Arranging for and the costs of

mechanical equipment, a sorting site, and labor needed in checking gradation shall be the Contractor's responsibility.

- G. The acceptability of the stones will be determined by the Program Manager prior to final placement.

2.02 GEOTEXTILE FABRIC FILTER

- A. Geotextile fabric shall meet the requirements of GA DOT Section 881.06 for woven fabrics, having physical properties as follows:

Tensile Strength- any direction (ASTM D 4634)	200 lbs.
Bursting Strength (ASTM D 3786)	500 psi
Elongation Before Breaking (ASTM D 4634)	10-35%
Percent Open Area (GOT: 88)	4.0-6.0%

PART 3 – EXECUTION

3.01 SURFACE PREPARATION

- A. Surfaces to receive filter materials and riprap, including the toe trench and slope, shall be brought to the line and grade indicated and shall be smooth and firm, free of brush, trees, stumps, and other objectionable material. Where filling of depressions is required or a filled bank is constructed, the new material shall be compacted with hand or mechanical tampers to a minimum of 85-percent of maximum density.
- B. The Contractor shall remove and exclude all stormwater, groundwater and creek or stream water from the excavation. Sump pumps and sand bags or portable dams, diversions, or other approved means, shall be used to remove and exclude water and continuously maintain water level below the bottom of the excavation. Water shall be removed and excluded until both geotextile filter material and riprap have been placed. Any water removed from the excavation shall not be discharged into any surface stream or other water body unless such discharge meets water quality standards. Removed water may be disposed on-site by land application using sprinklers in an area designated by the Engineer or by discharge into an approved treatment system.
- C. Cleared and excavated materials shall be hauled off site to an appropriate disposal location arranged by the Contractor and at its sole expense unless otherwise indicated or specified.
- D. Riprap installed at the toe of a stream bank below the elevation of the water in a stream to prevent scour from undermining the riprap shall be backfilled and covered with native soil to the original grade. The backfilled native soil shall be compacted with hand or mechanical tampers to a minimum of 85 percent of maximum density.

3.02 PLACEMENT OF GEOTEXTILE FABRIC

- A. The fabric shall be placed with the long dimension running up the slope, with the upstream strip overlapping the downstream strip. Use a minimum of 2-foot overlap for each overlap. Use a wider overlap if recommended by the geotextile manufacturer.
- B. The fabric shall be placed loosely with sufficient folded or gathered material to prevent stretching and tearing during riprap placement.
- C. The fabric shall be anchored into place using securing pins with type and spacing as recommended by the manufacturer. In addition, the fabric shall be secured at the toe and crest of the slope using anchor trenches at least 2-feet deep. If a stream bank extends sufficiently above a stream such that riprap would not be installed to the top of the bank, then the fabric shall be anchored in a 2-foot deep trench up-slope from the top of the minimum free-board of 0.5 feet above the flow resulting from a 50-year, 24-hour storm runoff event.

3.03 STONE RIPRAP

- A. Placement of riprap shall begin at the toe and proceed up the slope. The stones shall be placed, or dumped from a height of not more than three feet and placed with equipment or by hand. Sufficient hand work shall be performed to produce a neat and uniform surface.
- B. Dumped riprap shall be used only where there is an existing road access to the top and/or bottom of the stream bank. Riprap shall be dumped into place, beginning at the toe and proceeding up the slope, and may be spread using suitable equipment. Care must be taken to prevent damage to the underlying filter material. Sufficient hand work shall be performed to produce a neat and uniform surface.

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, maintaining and removing temporary erosion and sedimentation controls 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 Program Manager, Local Issuing Authority and State.
- C. Temporary sedimentation controls include, but are not limited to, Best Management Practices (BMP's) such as: silt fencing, silt dams, temporary sediment traps, check dams, 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 02273: Riprap
- D. Section 02485: Sodding
- E. Section 02486: Seeding
- F. 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 drawings.

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. Tree Protection Fence
- G. Tree/Shrubbery Restoration
- H. Fences
- I. Slope stabilization blankets
- J. Flocculants and coagulants
- K. Tackifiers
- L. Stream bank stabilization products
- M. 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. HECs 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 County.
- C. Filter stone - No. 57 - crushed stone.
- D. Filter media sock, silt fencing (Type NS or Type S).
- E. Tree protection 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. *GSWCC Field Manual for Erosion and Sedimentation Control in Georgia* – latest edition.

3.02 VEGETATIVE MEASURES

- A. Erosion control should be addressed in the planning stages of all proposed land-disturbing activities. While erosion is difficult to control completely, methods to reduce it are practical, affordable, and cost effective. Erosion control techniques shall be used on all areas exposed for a prolonged period of time, including areas that will be paved or built upon in the future. Various types of vegetative practices are used 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.
- 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 be undisturbed for more than six months.
- F. **Ds4 - Disturbed Area Stabilization (With Sodding)** may be used in place of Ds3.
- G. **“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.
- H. **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 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.
- I. **Slope Stabilization**
 - 1. It is the intention of this specification to allow interchangeable use of RECPs and HECPs for erosion protection on slopes. The project engineer 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.)
 - i. Photodegradable: Straw blankets with a top and bottom side photo degradable net. The maximum size of the mesh shall be openings of $\frac{1}{2}$ " X $\frac{1}{2}$ ". 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.
 - ii. 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.)
 - i. 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.
 - ii. 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.)
 - i. 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.
 - ii. 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.

- d. **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 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.
 - i. **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 these areas until they become permanently stabilized.

3.03 TREE PROTECTION AND SHRUBBERY

- A. The Contractor shall notify the County, Program Manager, and property owner, public or private, when there are assessment activities if vegetation (shrubs and trees), located outside of existing easements, are to be impacted by actions of the Contractor. Work done on easements on private property shall be discussed with the property owner and must include advising property owners of the impacts to existing plantings/vegetation the assessment will cause whether they are in easement or not. All damaged shrubbery shall be removed and replaced, in kind, with the agreement of the property owner and County. Tree protection, when necessary, shall be done in accordance with the Field Manual for Erosion and Sediment Control in Georgia, latest edition.

3.04 FENCING

- A. The Contractor shall notify the County, Program Manager, and property owners, public and private, of any impacts to fencing that assessment activities could have before the work is started. Should fencing have to be removed and replaced it shall be done with minimal impact to the property owner. Replacement fencing shall match the existing fencing as best as possible and be acceptable to the property owner and County. Fencing shall also be in compliance with the DeKalb County Zoning Ordinance, Chapter 27, Article 5.4.7, latest version.

3.05 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.

- 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.
- 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. Refer to Specification Section 02273 – Riprap for general riprap requirements.

3.06 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 Program Manager. The Program Manager 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 Program Manager.
- 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 Program Manager's 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.

3.07 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, that product or practice must have a documented C-factor of 0.080.

3.08 DOCUMENTATION

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 reports:

- A. Daily Inspection Report
- B. Daily Rainfall Monitoring Report
- C. Weekly Inspection Report
- D. Stormwater Monitoring Data
- E. Monthly Inspection Report
- F. Inspection Summary Report for violations and corrective actions.
- G. Erosion and Sedimentation Control Inspection Report

END OF SECTION

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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 <input type="checkbox"/>
Inspection Observations	
Petroleum Product Storage Areas: Are all of the temporary and permanent controls contained in Plan in place? <input type="checkbox"/> Yes <input type="checkbox"/> No 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? <input type="checkbox"/> Yes <input type="checkbox"/> No 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? <input type="checkbox"/> Yes <input type="checkbox"/> No Date of revision:	
Corrective Actions and Date:	

Signature of Certified Personnel

Printed Name of Certified Personnel

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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: <input type="checkbox"/>	Inspection within 24 hours of 0.5" storm event <input type="checkbox"/>
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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:

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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 <input type="checkbox"/>
Inspection Observations	
Areas that have undergone final stabilization: Are all permanent stabilization controls contained in Plan in place? <input type="checkbox"/> Yes <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe the location(s) and the corrective actions that must be taken. Are all erosion and sediment control measures operating properly? <input type="checkbox"/> Yes <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input type="checkbox"/> 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 02324
TRENCHING AND TRENCH BACKFILLING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This section includes:
 - 1. Requirements for the preparation of easements.
 - 2. Requirements for disposal of cleared materials.
 - 3. Instructions for dealing with obstructions encountered.
 - 4. Requirements for trench excavation.
 - 5. Requirements and application of shoring, sheeting, and bracing of trenches.
 - 6. Requirements for dewatering excavations.
 - 7. Trench foundation and stabilization
 - 8. Bedding and haunching material requirements.
 - 9. Requirements for the material and placement of initial backfill.
 - 10. Requirements for concrete encasement for pipelines.
 - 11. Requirements for the material and placement of final backfill.
 - 12. Requirements for the use of additional material for fill.
 - 13. Compaction and material requirements for backfill within traditional and Georgia DOT rights-of-way.
 - 14. Requirements for the use of flowable fill.
 - 15. Material, placement, and compaction requirements for compacted granular material.
 - 16. Testing and inspection requirements.
 - 17. Instructions for the disposal of excess excavated material.

1.01 RELATED SECTIONS

- A. Section 02010: Subsurface Conditions
- B. Section 02205: Dewatering
- C. Section 02535: Gravity Flow Sanitary Sewer
- D. Section 02730: Point Repairs to Sanitary Sewers
- E. Section 03300: Cast-in-Place Concrete

1.02 REFERENCES

- A. DeKalb County Department of Watershed Management Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards, Latest Edition and Version.
- B. ASTM C33 - Concrete Aggregates.
- C. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- D. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).
- E. ASTM D1556 - Standard Test Method for Density of Soil in Place by the Sand-Cone Method.
- F. ASTM D1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2700 kN-m/m³)).
- G. ASTM D2922 - Standard Test Method for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).
- H. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.03 SCOPE

- A. The work under this section consists of furnishing all labor, equipment, and materials and performing all operations in connection with the trench excavation and backfill required to install the pipelines.
- B. Excavation shall include removing any trees, stumps, brush, debris, or other obstacles remaining after the site preparation operations, obstructing the Work. Excavation shall also include the excavating and removing all earth, rock, or other materials, to the extent necessary, to install the pipe and appurtenances in conformance with the lines and grades shown on the Plans and as specified in the Specifications.
- C. Backfill shall include refilling and compacting the fill in the trenches and excavations up to the surrounding ground surface or road grade at crossing.
- D. Trenches are divided into five (5) specific areas:
 - 1. Foundation: The material beneath the bedding at the bottom of the excavated trench prior to any backfill. Where the existing foundation is unsuitable for the installation of backfill, over-excavation is required to install trench stabilization material (for example: rock or other stiffer material) to bring the bottom back to the elevation of the original trench.
 - 2. Bedding: The area above the trench bottom (or foundation) and below the bottom of the barrel (invert) of the pipe.

3. Haunching: The area above the bottom of the barrel of the pipe up to a specified height above the bottom of the barrel of the pipe.
 4. Initial Backfill: The area above the haunching material and below a plane twelve (12) inches above the top of the barrel of the pipe.
 5. Final Backfill: The area above a plane twelve (12) inches above the top of the barrel of the pipe.
- E. The choice of method, means, techniques, and equipment rests with the Contractor. The Contractor shall select the method and equipment for trench excavation and backfill depending upon the type of material to be excavated and backfilled, the depth of excavation, the amount of space available for operation of equipment, storing excavated material, proximity of man-made improvements to be protected, available easement or right-of-way, and prevailing practice in the area.

1.04 QUALITY ASSURANCE

- A. Density: All references to "maximum dry density" shall mean the maximum dry density as defined by ASTM D1557, except for cohesionless, free draining soils "maximum dry density" shall mean the maximum index density as determined by ASTM D4253. The density for foundation, bedding, haunching, or backfill materials in-place shall meet the requirements of ASTM D1556, and ASTM D2922.
- B. Sources and Evaluation Testing: Material testing certifying conformance with these Specifications shall be performed by an independent testing laboratory approved by the County.

1.05 SAFETY

- A. The Contractor shall perform all trench excavating and backfilling activities in accordance with the Occupational Safety and Health Act of 1970 (PL 91-596), as amended. The Contractor shall pay particular attention to the Safety and Health Regulations Part 1926, Subpart P "Excavation, Trenching & Shoring" as described in OSHA publication 2226 or latest version.

1.06 TESTING

- A. Testing shall be performed by an approved independent commercial testing laboratory. The County's Representative shall dictate the number of locations of testing. The Contractor shall coordinate testing and shall be responsible for the cost of the test.
- B. Tests and analysis of fill and borrow material shall be performed in accordance with the requirements of ASTM D1557.
- C. Compaction testing will be performed in accordance with the requirements of ASTM D1556 or ASTM D2292.
- D. If tests indicate Work does not meet specified requirements, the Contractor shall remove Work, replace, and retest at no cost to the County.
- E. Samples of native material intended for use as fill shall be provided by the contractor in time to allow for the Owner's independent commercial testing laboratory to conduct all necessary testing in time to support installation. Failure to provide timely,

suitable, acceptable or representative samples will not justify any claim by the contractor.

1.07 SUBMITTALS

- A. The Contractor shall submit a work plan for trenching and trench backfilling with complete written description identifying details of the proposed method of construction and the sequence of operations for construction relative to trenching and trench backfilling. The descriptions, with supporting illustrations, shall be sufficiently detailed to demonstrate to the County's Representative the procedures meet the requirements of these Specifications.
- B. The Contractor shall submit a dewatering plan in accordance with the requirements of Section 02205 - Dewatering.
- C. Flowable Fill: Certified mix design and test results; include material types and weight per cubic yard for each component of mix.
- D. The Contractor shall submit backfill material sources and product quality information.
- E. Where latest edition of OSHA Standards require, Contractor shall submit a shoring plan stamped by a licensed structural engineer licensed in the state of the project.
- F. The Contractor shall record locations of utilities, as installed, referenced to survey benchmarks. The Contractor shall include location of utilities encountered or rerouted. The Contractor shall give horizontal dimension, elevations, inverts, and gradients. The Contractor shall use either GPS technology or conventional survey to locate utilities.

1.08 JOB CONDITIONS

- A. Potholing:
 - 1. Confirm in the field the location of all existing parallel and/or crossing utilities that could affect installation of new conveyance facilities.
 - 2. Conduct potholing using non-destructive means such as high pressure air or water – vacuum excavation.
 - 3. Include potholing in provided bid price for trenching.
- B. Protect existing utilities that are to remain in service throughout construction (see Section 01041)
 - 1. Incorrectly located utilities – those found greater than 5 feet horizontally from the locations shown on the drawings or obtained by the utility locate operator.
 - a. Immediately consult the utility owner for directions.
 - b. Cooperate with utility companies in keeping respective services and facilities in operation.
 - 2. Repair damaged utilities to the satisfaction of the utility owner or have repair completed by the utility owner

- a. No additional charge to the contract will be allowed for damaged utilities.
- C. Unless specified otherwise in other Specifications Sections, the Contractor shall not interrupt existing utilities serving any facilities, during occupied hours, except when permitted in writing by the County and then only after acceptable temporary, utility services have been provided.
- D. The Contractor shall provide a minimum of forty-eight (48) hours notice to the County and utility owner, and receive written notice to proceed before interrupting any utility.
- E. The Contractor shall coordinate with utility companies for shut-off of services if lines are active. No separate payment shall be made.
- F. The Contractor shall notify the County's Representative of unexpected subsurface conditions and discontinue work in affected areas until notification to resume work.
- G. The Contractor shall protect the bottom of the trench and soil adjacent to and beneath trench from frost.
- H. The Contractor shall grade on either side of the trench to prevent surface water run-off into a trench.

PART 2 - PRODUCTS

2.01 TRENCH FOUNDATION MATERIALS

- A. Crushed stone shall be utilized for trench foundation (trench stabilization) and shall meet the requirements of the Georgia Department of Transportation Specifications Construction of Transportation Systems 800.2.01, Group I (limestone, marble, or dolomite) or Group II (quartzite, granite, or gneiss). Stone size shall be between No. 57 and No. 4, inclusive.

2.02 BEDDING AND HAUNCHING MATERIALS

- A. Unless specified otherwise, bedding and haunching materials shall be crushed stone as specified below.
- B. Crushed stone utilized for bedding and haunching shall meet the requirements of the Georgia Department of Transportation Specifications Construction of Transportation Systems 800.2.01, Group I (limestone, marble, or dolomite) or Group II (quartzite, granite, or gneiss). Stone size shall be between No. 57 and No. 4, inclusive.
- C. Filter Fabric - Non-Woven Type
 - 1. Filter fabric associated with bedding shall be a UV stabilized, continuous filament, needle-punched, polypropylene, nonwoven geotextile.
 - 2. The fabric shall have an Equivalent Opening size (EOS) and Apparent Opening Size (AOS) of one-hundred and twenty (120) to seventy (70). The fabric shall also conform to the minimum property values listed in the following table:

Fabric Property	Unit	Test Procedure	Average Value	
			Typical	Minimum
Weight	oz/yd ²	ASTM D 3776	10.0	
Thickness	mils	ASTM D 1777	105	
Grab Strength	lbs.	ASTM D 4632	270	210
Grab Elongation	%	ASTM D 4632	>50	50
Tear Strength	lbs.	ASTM D 4533	105	85
CBR Puncture Strength	lbs.	ASTM D 6241	725	100
Permittivity	sec ⁻¹	ASTM D 4491	1.2	
Water Permeability	cm/sec	ASTM D 4491	0.3	
Water Flow Rate	gpm/ft ²	ASTM D 4491	85	
UV Resistance (500 hrs)	%	ASTM D 4355	>70	

3. If directed by the County's Representative, the filter fabric manufacturer shall furnish the services of a competent factory representative to supervise and/or inspect the installation of pipe. This service will be furnished for a minimum of ten (10) days during initial pipe installation at no additional cost to the County.
4. Filter fabric shall be TenCate Mirafi® S1000, Propex GeoTex® 1071 or approved equal.

2.03 INITIAL BACKFILL

- A. Within the Right-of-Way initial backfill material shall be No. 89 stone.
- B. Earth materials utilized for initial backfill shall be suitable materials selected from materials excavated from the trench. Suitable materials shall be clean and free of rock larger than two (2) inches at its largest dimension, organics, cinders, stumps, limbs, frozen earth or mud, man-made wastes, and other unsuitable materials. Should the material excavated from the trench be saturated, the saturated material may be used as earth material, provided it is allowed to dry properly and it is capable of meeting the specified compaction requirements. When necessary, initial backfill materials shall be moistened to facilitate compaction by tamping. If materials excavated from the trench are not suitable for use as initial backfill material, the Contractor shall provide select material conforming to the requirements of this section.

2.04 FINAL BACKFILL

- A. No. 89 Stone Within the Right-of-Way with final two feet GAB.
- B. Outside Right-of-Way as described in 2.3.B of this specification

2.05 SELECT BACKFILL

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

2.06 CONCRETE

- A. Concrete for, bedding, haunching, initial backfill, or encasement shall be as directed by the County's Representative.
- B. Inside Right-of-Way a concrete cap shall be installed after the final backfill has been installed per GDOT Standards and Specifications.

2.07 FLOWABLE FILL

Flowable fill, where required for trench backfill, shall meet the requirements of the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, Section 600 for Excavatable or Non-Excavatable type. The County's Representative will determine the type of flowable fill to be used on a case-by-case basis.

2.08 GRANULAR MATERIAL

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

2.09 COMPACTION EQUIPMENT

Compaction equipment shall be of suitable type and adequate to obtain the compaction specified. Compaction equipment shall be operated in strict accordance with the manufacturer's instructions and recommendations and shall be maintained in such condition to deliver the manufacturer's rated compaction effort.

PART 3 - EXECUTION

3.01 PREPARATION OF PIPELINE EASEMENT

- A. Where clearing or partial clearing of the easement is necessary, the Contractor shall clear the easement prior to the start of trenching. The Contractor shall cut trees and brush as near to the surface of the ground as practicable, remove all stumps, and pile for disposal. The Contractor shall not permit excavated materials to cover brush or trees prior to disposal.
- B. The Contractor shall not remove existing trees or tree limbs over two (2) inches in diameter, whether on public or private property, unless they are within ten (10) feet of the pipe centerline, without approval of the County's Representative.
- C. Trees and shrubs farther than ten (10) feet from pipe centerline shall not be removed unless designated for removal by the County's Representative or Arborist. The Contractor shall protect all other trees and shrubs.

3.02 DISPOSAL OF CLEARED MATERIAL

- A. The Contractor shall bear all costs of disposing of trees, stumps, brush, roots, limbs, and other waste materials from the clearing operation. Material shall be disposed of in such a manner so as to meet all the requirements of Federal, State, and local regulations regarding health, safety, and public welfare. All cleared material shall be disposed of off the site of the Work in an approved location at the Contractor's expense.

3.03 OBSTRUCTIONS

- A. This item refers to obstructions which may be removed and do not require replacement. The Contractor shall remove obstructions within the trench area or adjacent thereto such as tree roots, stumps, abandoned piling, concrete structures, logs, and debris of all types without additional compensation. The County's Representative may, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment changes can be made within the easement or right-of-way without adversely affecting the intended function of the facility. The Contractor shall be paid for all additional costs or shall credit the County for any savings resulting from such alignment changes.
- B. The Contractor shall dispose of obstructions removed from the excavation in accordance with the requirements of this section.

3.04 TRENCH EXCAVATION

- A. Topsoil and grass shall be stripped a minimum of six (6) inches over the trench excavation site and stockpiled separately for replacement, if suitable, over the finished grading areas.
- B. Trenches shall be excavated to the lines and grades to allow pipe construction at original grade with the centerlines of the trenches on the centerlines of the pipes and to the dimensions providing the proper support and protection of the pipe and other structures and accessories.
- C. Trench Width for Pipelines:
 - 1. The sides of all trenches shall be vertical, as much as possible, to a minimum of one (1) foot above the top of the pipe. Unless otherwise indicated on the Plans, the maximum trench width shall be equal to the sum of the outside diameter of the pipe plus two (2) feet or 48" minimum for trenches with sheeting, unless exceeded by the previous. The minimum trench width shall allow the proper consolidation of the haunching and initial backfill material.
 - 2. The Contractor shall excavate the top portion of the trench to any width, within the construction easement or right-of-way, which will not cause unnecessary damage to adjoining structures, roadways, pavement, utilities, trees, or private property. Where necessary to accomplish this, the Contractor shall provide sheeting and shoring. The Contractor may use trench boxes. In no case shall trench boxes be stacked more than sixteen (16) feet [two (2) boxes] to stabilize the trench.

3. Where rock is encountered in trenches, the Contractor shall excavate to remove boulders and stones to provide a minimum of six (6) inches clearance between the rock and any part of the pipe or manhole.
- D. Excavated Materials:
1. Excavated materials shall be placed adjacent to the Work to be used for backfilling as required. Top soil shall be carefully separated and lastly placed in its original location.
 2. Excavated materials shall not be placed in public roadways or rights-of-way unless the material will be used as backfill within forty-eight (48) hours of excavation. Excavated materials not used as backfill shall be immediately disposed of away from the site of the Work.
 3. Excavated material shall be placed sufficiently back from the edge of the excavation to prevent caving the trench wall, to permit safe access along the trench, and not cause any drainage problems. Excavated material shall be placed so as not to damage existing landscape features or man-made improvements.

3.05 SHORING, SHEETING, AND BRACING OF TRENCHES

- A. The Contractor shall sheet and brace the trench as required by Federal, State, and local laws and regulations. Shoring, sheeting, and bracing shall be designed by a Professional Engineer registered in the state of the project location. OSHA standards shall be used to prevent caving during excavation in unstable material, or to protect adjacent structures, property, workers, and the public. The Contractor shall increase trench widths accordingly by the thickness of the sheeting. The Contractor shall maintain sheeting in place until the pipe has been placed and backfilled at the pipe zone. Shoring and sheeting shall be removed, as the backfilling is done, in a manner not to damage the pipe or permit voids in the backfill. All sheeting, shoring, and bracing of trenches shall conform to the safety requirements of the Federal, State, or local public agency having jurisdiction. The most stringent of these requirements shall apply.
- B. Sheeting, bracing, and shoring shall be performed in the following instances:
1. When sloping trench walls do not adequately protect persons within the trench from slides or cave-ins.
 2. In caving ground.
 3. In wet, saturated, flowing, or otherwise unstable materials, the sides of all trenches and excavations shall be adequately sheeted, braced, and shored.
 4. Where trenches and other excavations are within ten (10) feet from existing buildings and structures or where necessary to prevent damage to adjoining buildings, structures, roadways, pavement, utilities, trees, or private properties, which are required to remain, whichever is more stringent.
 5. Where necessary to maintain the top of the trench within the available construction easement or right-of-way.
- C. In all cases, excavation protection shall strictly conform to the requirements of the latest Occupational Safety and Health Act.

- D. Timber: Timber for shoring, sheeting, or bracing shall be sound and free of large or loose knots and in good, serviceable condition. Size and spacing shall be in accordance with OSHA regulations.
- E. Steel Sheeting and Sheet Piling: Steel sheet piling shall be the continuous interlock type. The weight, depth, and section modulus of the sheet piling shall be sufficient to restrain the loads of earth pressure and surcharge from existing foundations and live loads. Procedure for installing and bracing shall be so scheduled and coordinated with removing the earth so the ground under existing structures shall be protected against lateral movement at all times. The Contractor shall provide closure and sealing between sheet piling and existing facilities.
- F. Trench Shield: A trench shield or box may be used to support the trench walls. The use of a trench shield does not necessarily preclude the additional use of bracing and sheeting. When trench shields are used, care must be taken to avoid disturbing the alignment and grade of the pipe or disrupting the haunching of the pipe as the shield is moved. When the bottom of the trench shield extends below the top of the pipe, the trench shield shall be raised in six (6) inch increments with specified backfilling occurring simultaneously. At no time shall the trench shield be "dragged" with the bottom of the shield extending below the top of the pipe.
- G. The Contractor shall remove bracing and sheeting in units when backfill reaches the point necessary to protect the pipe and adjacent property. The Contractor shall leave sheeting in place when, in the opinion of the County's Representative, it cannot be safely removed or is within three (3) feet of an existing structure, utility, or pipeline. The Contractor shall cut off any sheeting left in place at least six (6) feet below the surface.
- H. Sheet piling within three (3) feet of an existing structure or pipeline shall remain in place, unless otherwise directed by the County's Representative.
- I. If, in the opinion of the County's Representative, the material furnished for supporting excavation is not the proper quality or sufficient size, or not properly placed to ensure the safety of the Work or adjacent structures or property, the Contractor shall, upon notice by the County's Representative, immediately procure and place satisfactory supports, or place said supports in a satisfactory manner. Failing to do so, the County's Representative may order the Contractor to stop work until said notice has been complied with and without entitling the Contractor to any claim for extra compensation, damage, or delay.
- J. When required by the County's Representative, a shoring plan shall be submitted by the Contractor for approval prior to construction of the particular portion of the Work.
- K. All excavation supports shall be withdrawn in stages on both sides of trenches to prevent lateral movement of the pipe as the backfilling is being done, except where, and to the extent the County's Representative shall order. The County's Representative can permit the same to be left in place, at the Contractor's request and the Contractor's expense. The Contractor shall cut off any sheeting left in place

at least six (6) feet below finished grade whenever ordered by the County's Representative.

3.06 DEWATERING EXCAVATIONS

- A. Dewatering shall be performed in accordance with the requirements of Section 02205 - Dewatering.

3.07 TRENCH FOUNDATION AND STABILIZATION

- A. The bottom of the trench shall provide a foundation to support the pipe and its specified bedding. The trench bottom shall be graded to support the pipe and bedding uniformly throughout its length and width.
- B. If, after dewatering as specified above, the trench bottom is spongy the trench bottom does not provide firm, stable footing, or the material at the bottom of the trench will still not adequately support the pipe, the trench will be determined to be unsuitable and the County's Representative shall then order trench stabilization by directing the Contractor to over excavate the trench bottom and fill with crushed stone.
- C. Where replacing the unsuitable material with crushed stone does not provide an adequate trench foundation, the trench bottom shall be excavated to a depth of at least two (2) feet below the specified trench bottom. The Contractor shall place filter fabric in the bottom of the trench and support the fabric along the trench walls until the trench stabilization, bedding, haunching, and pipe have been placed at the proper grade. The ends of the filter fabric shall be overlapped above the pipe.
- D. Where trench stabilization is provided, the trench stabilizing material shall be compacted to at least ninety (90) percent of the maximum dry density, unless specified otherwise in these Specifications or in the Construction Documents.

3.08 BEDDING AND HAUNCHING

- A. Prior to placing bedding material, the trench bottom shall be free of any water, loose rocks, boulders, or large dirt clods.
- B. Bedding material shall be placed to provide uniform support along the bottom of the pipe and to place and maintain the pipe at the proper elevation. The initial layer of bedding placed to receive the pipe shall be brought to the grade and dimensions needed to match the existing sewer profile. All bedding shall extend the full width of the trench bottom. The pipe shall be placed and brought to grade by tamping the bedding material or by removing the excess amount of the bedding material under the pipe. Adjusting to grade and line shall be made by scraping away or filling with bedding material. Wedging or blocking up pipe shall not be permitted. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade shall not be permitted. Each pipe section shall have a uniform bearing on the bedding for the length of the pipe, except immediately at the joint.
- C. At each joint, the Contractor shall excavate bell holes of ample depth and width to permit the joint to be assembled properly and to relieve the pipe bell of any load.

- D. After the pipe section is properly placed, the Contractor shall add the haunching material to the specified depth. The haunching material shall be shovel sliced, tamped, vigorously chinked, or otherwise consolidated to provide uniform support for the pipe barrel and to fill completely the voids under the pipe, including the bell hole. Prior to placement of the haunching material, the bedding shall be clean and free of any water, loose rocks, boulders, or dirt clods.
- E. Gravity Sewers and Accessories: The Contractor shall lay pipe with Class "C" bedding, unless otherwise shown on the Plans, specified in these Specifications, specified by the manufacturer, or directed by the County's Representative. The following are definitions of the various bedding classifications:
1. Class "A": The Contractor shall excavate the bottom of the trench flat at the minimum depth required to set the pipe above bedding to match the existing profile. The Contractor shall lay pipe to line and grade on concrete block having a minimum width of six (6) inches greater than the outside diameter of the pipe, but shall not be greater than twenty four (24) inches greater than the outside diameter. The minimum thickness of the cradle under the bottom of the pipe shall be one-half ($\frac{1}{2}$) of the outside diameter of the pipe up to twelve (12) inches in diameter. The minimum thickness of the cradle under the bottom of the pipe shall be one-quarter ($\frac{1}{4}$) of the outside diameter for pipe greater than twelve (12) inches in diameter. The maximum thickness of the cradle under the bottom of the pipe shall be twelve (12) inches. The cradle shall extend up the sides of the pipe for a height equal to one-half ($\frac{1}{2}$) its outside diameter.
 2. Class "B": The Contractor shall excavate the bottom of the trench flat at the minimum depth required to set the pipe above bedding to match the existing profile. The Contractor shall place and compact bedding material to the proper grade. The minimum thickness of the compacted No. 57 stone bedding under the bottom of the pipe shall be one-half ($\frac{1}{2}$) of the outside diameter for pipe up to twelve (12) inches in diameter. The minimum thickness of compacted No. 57 stone under the bottom of the pipe shall be one-quarter ($\frac{1}{4}$) of the outside diameter for pipe greater than twelve (12) inches in diameter. The compacted No. 57 stone placement shall be up to one-half ($\frac{1}{2}$) of the outside diameter of the pipe. The backfill shall then be completed with selected material, hand placed and tamped to the limits denoted in the Contract Drawings. Bedding and backfill shall be placed to the final width of the trench, as excavated. Class "B" Bedding shall be used for PVC Pipe.
 3. Class "C": The Contractor shall excavate the bottom of the trench flat at the minimum depth required to set the pipe above bedding to match the existing profile. The Contractor shall place and compact bedding material to the proper grade. The minimum thickness of the compacted No. 57 stone bedding under the bottom of the pipe shall be one-half ($\frac{1}{2}$) of the outside diameter for pipe up to twelve (12) inches in diameter. The minimum thickness of compacted No. 57 stone under the bottom of the pipe shall be one-quarter ($\frac{1}{4}$) of the outside diameter for pipe greater than twelve (12) inches in diameter. The compacted No. 57 stone placement shall be up to one-quarter ($\frac{1}{4}$) of the outside diameter of the pipe. The backfill shall then be completed with selected material, hand placed and tamped to the limits denoted in the Contract Drawings. Bedding and backfill shall be placed to

the final width of the trench, as excavated. Class "C" Bedding shall be used for DIP Pipe.

4. Type 5: The Contractor shall excavate the bottom of the trench flat at the minimum depth required to set the pipe above bedding to match the existing profile. The Contractor shall place and compact bedding material to the proper grade before installing pipe. After the pipe has been brought to the proper grade, haunching material shall be carefully placed by hand and compacted to the top of the pipe.
- F. Manholes: The Contractor shall excavate to a minimum of twelve (12) inches below the planned elevation of the base of the manhole. The Contractor shall place and compact crushed stone bedding material to the required grade before constructing the manhole.
- G. Excessive Width and Depth:
1. Gravity Sewers: If the trench is excavated to excess width, the Contractor shall provide the bedding class with the next higher bedding factor. Type 5 Bedding may be used in lieu of Class "A" Bedding, where Class "A" Bedding is necessitated by excessive trench width.
 2. If the trench is excavated to excessive depth, the Contractor shall provide crushed stone to place the bedding at the proper elevation or grade.
- H. Compaction: Bedding and haunching materials under the pipe, manholes, and accessories shall be compacted to a minimum of ninety (90) percent of the maximum dry density, unless shown or specified otherwise in these Specifications.

3.09 INITIAL BACKFILL

- A. Initial backfill shall be placed to anchor the pipe, protect the pipe from damage by subsequent backfill, and ensure the uniform distribution of the loads over the top of the pipe.
- B. The Contractor shall place initial backfill material carefully around the pipe in uniform layers to a depth of at least twelve (12) inches above the pipe barrel. Layer depths shall be a maximum of six (6) inches for pipe eighteen (18) inches in diameter and smaller and a maximum of twelve (12) inches for pipe larger than eighteen (18) inches in diameter.
- C. The Contractor shall backfill on both sides of the pipe simultaneously to prevent side pressures.
- D. The Contractor shall compact each layer thoroughly with suitable hand tools or tamping equipment.
- E. Initial backfill shall be compacted to a minimum ninety (90) percent of the maximum dry density, unless shown or specified otherwise in these Specifications or the Construction Documents.

- F. If materials excavated from the trench are not suitable for use as backfill materials, the Contractor shall provide select backfill material conforming to the requirements of this section for initial backfill.

3.010 CONCRETE ENCASEMENT FOR PIPELINES

- A. As directed by the County's Representative where concrete encasement is needed, the Contractor shall excavate the trench to provide a minimum of twelve (12) inches clearance from the barrel of the pipe. The Contractor shall lay the pipe to line and grade on solid concrete blocks or solid bricks. In lieu of bedding, haunching, and initial backfill, the Contractor shall place concrete to the full width of the trench and to a height of not less than twelve (12) inches above the pipe barrel. The Contractor shall not backfill the trench for a period of at least twenty-four (24) hours after concrete is placed.

3.011 FINAL BACKFILL

- A. The Contractor shall backfill carefully to restore the ground surface to its original condition.
- B. Except as specified otherwise in this section, the top six (6) inches shall be topsoil obtained as specified in this section.
- C. Excavated material unsuitable for backfilling and excess material shall be disposed of in accordance with the local, State, and Federal requirements.
- D. If materials excavated from the trench are not suitable for use as backfill materials, the Contractor shall provide select backfill material conforming to the requirements of this section.
- E. After initial backfill material has been placed and compacted, the Contractor shall backfill the trench with final backfill material. The Contractor shall place backfill material in uniform layers, compacting each layer thoroughly as follows:
 - 1. In six (6) inch layers, if using light power tamping equipment, such as a "jumping jack"
 - 2. In twelve (12) inch layers, if using heavy tamping equipment, such as hammer with tamping feet
 - 3. In twenty-four (24) inch layers, if using a hydra-hammer
- F. Settlement: If the trench settles, the Contractor shall re-fill, compact, and grades the surface to conform to the adjacent surfaces.
- G. Final backfill shall be compacted to a minimum ninety (90) percent of the maximum dry density, unless specified otherwise.

3.012 ADDITIONAL MATERIAL

Where final grades above the pre-construction grades are required to maintain minimum cover, additional fill material shall be placed as directed by the County's Representative.

1. The Contractor shall utilize excess material excavated from the trench, if the material is suitable.
2. If excess excavated materials are not suitable, or if the quantity available is not sufficient, the Contractor shall provide additional suitable fill material.

3.013 BACKFILL WITHIN RIGHTS-OF-WAY

The Contractor shall compact per the requirements found as stipulated on the Standard Trench Detail.

3.014 BACKFILL WITHIN GEORGIA DOT RIGHTS-OF-WAY

Backfill within the Georgia DOT rights-of-way shall meet the requirements stipulated on the Standard Trench Detail.

3.015 FLOWABLE FILL

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

3.016 COMPACTED GRANULAR MATERIAL

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

3.017 TESTING AND INSPECTION

- A. The soils testing laboratory is responsible for the following:
 1. Compaction tests in accordance with the requirements of this section.
 2. Field density tests for each two (2) feet of lift, one (1) test site between each pair of manholes, every one-hundred (100) feet within road rights-of-way, or more frequently if ordered by the County's Representative. The County's Representative will direct where density tests will be performed along the site of the Work.
 3. Inspecting and testing stripped areas, subgrades, and proposed fill materials.

- B. The Contractor's duties relative to testing shall include the following:
1. Notifying laboratory of conditions requiring testing.
 2. Coordinating with laboratory for field testing.
 3. Paying costs for additional testing performed beyond the scope required and for re-testing where initial tests reveal non-conformance with specified requirements.
 4. Providing excavation as necessary for laboratory personnel to conduct tests.
- C. Inspection:
1. Earthwork operations, acceptability of excavated materials for bedding or backfill, and placing and compaction of bedding and backfill is subject to inspection by the County's Representative.
 2. Foundations and shallow spread footing foundations are required to be inspected by a geotechnical engineer, who shall verify suitable bearing and construction.
- D. The Contractor shall comply with applicable codes, ordinances, rules, regulations, and laws of local, state, and federal authorities having jurisdiction.

3.018 DISPOSAL OF EXCESS EXCAVATED MATERIAL

The Contractor shall dispose of excess excavated material in accordance with the requirements of local, state, and federal laws and regulations. The Contractor shall make arrangements for the disposal and bear all costs of disposal.

END OF SECTION

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 Program Manager.
- C. 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. 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

- A. 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 Program Manager.

- B. An area is considered acceptable if the majority of each piece of sod is alive and healthy and generally free from weeds, insects, and disease.
- C. The Contractor is responsible for 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.
- B. Perform maintenance operations during maintenance period to include:
 - 1. Monitoring for drying, displacement, damage
 - 2. Watering: First 2 weeks water daily, 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. Resod unsatisfactory areas, or portions thereof, immediately at the end of the maintenance period if a satisfactory 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

- A. 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

- A. 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 Program Manager.

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 Program Manager, 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 Program Manager.
- C. During times when sodding cannot be conducted, erosion control and silt fences shall be placed and maintained. If property owner and the Program Manager agree, seeding may be substituted for sodding.
- D. Apply fertilizer and agricultural limestone uniformly over the sod bed at the rates shown below. 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. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.
- G. Two weeks after the sod is installed, top dress and thoroughly water it. Top dressing shall consist of the following:
 - 1. 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.
- H. 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.
- B. Maintain lawns for not less than three mowings or 60 days, whichever is longer.
- C. 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.
- D. The standard of acceptability for bare areas is no larger than 3 inches in any dimension, nor greater than 5 percent of the lawn.

3.04 INSPECTION

- A. The Program Manager shall inspect the sod within 30 days after installation and determine if it is acceptable.
- B. The Program Manager will again review the sod for acceptance 30 and 60 days after installation. This acceptance by the County is for the purposes of payment only.

3.05 PROTECTION

- A. 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

- A. 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. 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: (i) name, (ii) percentages of purity and of germination, and (iii) weed content for each kind of seed furnished
 - 3. Mixtures: Proportions of each kind of seed
- C. Seed Inoculant Certification: Bacteria prepared specifically for legume species to be inoculated

1.04 DELIVERY, STORAGE, AND PROTECTION

- A. Furnish in standard containers with seed name, lot number, net weight, percentages of purity, germination, and hard seed and maximum weed seed content, clearly marked for each container of seed.
- B. Keep dry during storage.

1.05 WEATHER RESTRICTIONS

- A. Perform work under favorable weather and soil moisture conditions as determined by accepted local practice.

1.06 GUARANTEE

- A. Secure an acceptable growth of grass in all areas designated for seeding
- B. An area is considered acceptable if it is represented by a minimum of 100 seedlings per square foot of the permanent species of grass representative of the seed mixture. If an acceptable growth is not obtained on the first planting, reseeding and remulching will be required
- C. If the planting is less than 50 percent successful, rework the ground, refertilize, reseed, and remulch the entire area.

1.07 MAINTENANCE

- A. Begin maintenance immediately after each area is planted and continue until final acceptance of the Contract.
- 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, thereafter keep surface moist.
 - 2. Washouts: Re-grade and re-seed at the Contractor's expense until good sod 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.
 - b. Mowing should not be performed during the quail nesting season (May to September)
 - 5. Rake clippings and leaves, and appurtenances until the project is completed.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Products and applications to match Contract application period and meet manufacturers' recommendations.
- 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 that ensure 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.
- F. Seed Quality:
 - 1. The term “pure live seed” is used to express the quality of seed and is not shown on the label. Pure live seed, PLS, is expressed as a percentage of the seeds that are pure and will germinate. Information on percent germination and purity can be found on seed tags. PLS is determined by multiplying the percent of pure seed with the percent of germination; i.e.,
 - (PLS = % germination x % purity)

EXAMPLE:

Common Bermuda seed
70% germination, 80% purity

PLS = 70% germination x 80% purity
PLS = 56%
 - 2. The percent of PLS helps you determine the amount of seed you need. If the seeding rate is 10 pounds PLS and the bulk seed is 56 % PLS, the bulk seeding rate is:
 - 10 lbs. PLS/acre = 17.9 lbs. /acre
56% PLS
 - 3. You would need to plant 17.9 lbs. /acre to provide 10 lbs. /acre of pure live seed.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Soil samples to be obtained to determine lime requirements.
- B. Lime shall be applied at the rate as shown on the drawings.
- C. Agricultural lime is required at the rate of one to two tons per acre unless soil tests indicate otherwise. Graded areas require lime application. If lime is applied within six months of planting permanent perennial vegetation, additional lime is not required. Agricultural lime shall be within the specifications of the Georgia Department of Agriculture.
 - 1. Lime spread by conventional equipment shall be “ground limestone.” Ground limestone is calcitic or dolomitic limestone ground so 90 percent of the material will pass through a 10-mesh sieve, not less than 50 percent will pass through a 50-mesh sieve, and not less than 25 percent will pass through a 100-mesh sieve.
 - 2. Fast-acting lime spread by hydraulic seeding equipment should be “finely ground limestone” spanning from the 180 micron size to the 5 micron size. Finely ground limestone is calcitic or dolomitic limestone ground so 95 percent of the material will pass through a 100-mesh sieve.

3. It is desirable to use dolomitic limestone in the Sand Hills, Southern Coastal Plain and Atlantic Coast Flatwoods MLRAs.
 4. Agricultural lime is generally not required where only trees are planted.
 5. Initial fertilization, nitrogen, topdressing, and maintenance fertilizer requirements for each species or combination of species shall be followed.
- D. 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.

3.02 INSTALLATION

- A. Grading and shaping may not be required where hydraulic seeding and fertilizing equipment is to be used. Vertical banks shall be sloped to enable plant establishment.
1. When conventional seeding and fertilizing are to be done, grade and shape where feasible and practical, so equipment can be used safely and efficiently during seedbed preparation, seeding, mulching and maintenance of the vegetation.
 2. 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 larger than 2 inches shall be removed.
- C. When a hydraulic seeder is used, seedbed preparation is not required. When using conventional or hand-seeding, seedbed preparation is not required if the soil material is loose and not sealed by rainfall.
1. When soil has been sealed by rainfall or consists of smooth cut slopes, the soil shall be pitted, trenched or otherwise scarified to provide a place for seed to lodge and germinate.
- D. Lime shall be spread evenly over surface and thoroughly incorporated with loam by heavy raking to at least 2 inches deep at a rate determined by soil samples to match Contract.
- E. When hydraulic seeding equipment is used, the initial fertilizer shall be mixed with seed, inoculant (if needed), and wood cellulose or wood pulp fiber mulch and applied in a slurry. The inoculant, if needed, shall be mixed with the seed prior to being placed into the hydraulic seeder. The slurry mixture will be agitated during application to keep the ingredients thoroughly mixed. The mixture will be spread uniformly over the area within one hour after being placed in the GSWCC (Amended - 2013) 6-89 hydro seeder.
1. Finely ground limestone can be applied in the mulch slurry or in combination with the top dressing.
 2. When conventional planting is to be done, lime and fertilizer shall be applied uniformly in one of the following ways:

- a. Apply before land preparation so it will be mixed with the soil during seedbed preparation.
 - b. Mix with the soil used to fill the holes, distribute in furrows.
 - c. Broadcast after steep surfaces are scarified, pitted or trenched.
 - d. A fertilizer pellet shall be placed at root depth in the closing hole beside each pine tree seedling.
- F. Fertilizer shall be uniformly spread and immediately mixed with the upper 2 inches of the soil.

G. Seeding

1. Hydraulic Seeding

Mix the seed (inoculated if needed), fertilizer, and wood cellulose or wood pulp fiber mulch with water and apply in a 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 cultipacker or other suitable equipment.

3. No-Till Seeding

No-till seeding is permissible into annual cover crops when planting is done following maturity of the cover crop or if the temporary cover stand is sparse enough to allow adequate growth of the permanent (perennial) species. No-till seeding shall be done with appropriate no-till seeding equipment. The seed must be uniformly distributed and planted at the proper depth.

H. Mulching

Mulching is required for all permanent vegetation applications. Mulch applied to seeded areas shall achieve 75% to 100% soil cover. When selecting mulch, design professionals should consider the mulch's functional longevity, vegetation establishment enhancement, and erosion control effectiveness. Select the mulching material from the following and apply as indicated:

- 1. Dry straw or dry hay of good quality and free of weed seeds can be used. Dry straw shall be applied at the rate of 2 tons per acre. Dry hay shall be applied at a rate of 2 1/2 tons per acre.
- 2. Wood cellulose mulch or wood pulp fiber shall be used with hydraulic seeding. It shall be applied at the rate of 500 pounds per acre. Dry straw or dry hay shall be applied (at the rate indicated above) after hydraulic seeding.
- 3. One thousand pounds of wood cellulose or wood pulp fiber, which includes a tackifier, shall be used with hydraulic seeding on slopes 3/4:1 or steeper.

- a. Sericea Lespedeza hay containing mature seed shall be applied at a rate of three tons per acre.
- b. Pine straw or pine bark shall be applied at a thickness of 3 inches for bedding purposes. Other suitable materials in sufficient quantity may be used where ornamentals or other ground covers are planted. This is not appropriate for seeded areas.
- c. When using temporary erosion control blankets or block sod, mulch is not required.
- d. Bituminous treated roving may be applied on planted areas, slopes, in ditches or dry waterways to prevent erosion. Bituminous treated roving shall be applied within 24 hours after an area has been planted. Application rates and materials must meet Georgia Department of Transportation specifications.

Wood cellulose and wood pulp fibers shall not contain germination or growth inhibiting factors. They shall be evenly dispersed when agitated in water. The fibers shall contain a dye to allow visual metering and aid in uniform application during seeding.

- I. Immediately following this presentation the seed shall be uniformly applied and lightly raked into the surface. Lightly roll the surface and water with a fine spray. Seed shall be sown in a favorable season, as approved by the Program Manager.
- J. Wildlife plantings should be included in critical area plantings.

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 furnish, install, test, and inspect full length (manhole to manhole) and external point repairs on gravity flow sanitary. Unless directed otherwise in writing by the Program Manager the Contractor shall use only the pipe size and material specifically designated.
- B. External Point repair is the method for correcting a defect on a mainline requiring excavation. This type of repair shall include excavation, replacing a section of pipe up to eight (8) linear feet in length (minimum); replacing up to two (2) service connections, installing flexible repair couplings or boots as applicable, backfilling, disposal and site restoration.
- C. The replacement pipe section shall be the same size and material as the existing pipe unless the existing pipe is vitrified clay. In such case, pipe section material shall be as directed by the Program Manager.
- D. 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 RELATED SECTIONS

- A. Section 01520: Sewer Flow Control
- B. Section 02205: Dewatering
- C. Section 02324: Trenching and Trench Backfilling
- D. Section 02276: Site Restoration and Erosion Control
- E. Section 02537: Ductile Iron Sanitary Sewer Pipe and Fittings
- F. Section 02622: PVC Gravity Sewer Pipe
- G. Section 02641: Precast Concrete Manholes

1.03 REFERENCES

- A. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457-mm (180-in) Drop.
- B. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe.
- C. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.

- D. ASTM C425 – Standard Specification for compression Joints for Vitrified Clay Pipe and Fittings
- E. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lb/ft³ (600 kN-m/m³)).
- F. ASTM D1557 - Standard Test Method for Laboratory, Compaction Characteristics of Soils Using Modified Proctor Effort (56,000 ft-lb/ft³ (2,700 kN-m/m³))
- G. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- H. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
- I. American Water Works Association (AWWA), Latest Revisions.

1.04 SUBMITTALS

- A. Submittals shall conform to the requirements of Section 01300 - Submittals.
- B. The Contractor shall submit:
 - 1. Proposed methods for sewer construction.
 - 2. Equipment for sewer construction.
 - 3. Materials for sewer construction.
 - Sequence of operations for sewer construction.
- C. The Contractor shall plan operations to minimize disruption of utilities and to occupied facilities on adjacent property.
- D. The Contractor shall submit manufacturers' instructions indicating special procedures required to install products specified.
- E. The Contractor shall submit certifications for products meeting or exceeding the requirements specified in these Specifications.
- F. The Contractor shall submit Record Documents.
- G. The Contractor shall submit test reports.
- H. The Contractor shall complete 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 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 Program Manager.
 - 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).
- I. For projects entering a Georgia Department of Transportation (GDOT) controlled Right-of-Way:
1. Projects within the State controlled Right-of-Way shall conform to the requirements outlined in Section 01060 – Regulatory Requirements

1.02 QUALITY ASSURANCE

- A. The Contractor shall provide the Program Manager with the product manufacturers' written certification indicating all products furnished comply with all applicable provisions of these Specifications. Except as may be modified herein, all materials used in the manufacture of pipe, linings, manholes, and castings shall be new and shall be tested in accordance with the referenced standards, as applicable. The Contractor shall be responsible for performing and paying for sampling and testing as necessary for the certifications. The Program Manager shall have the right to witness testing of the materials.
- B. The sewer pipe shall be tested and inspected at the place of manufacture for all requirements of the latest applicable ASTM standards, and certified copies of the test report covering each shipment shall be submitted to the Program Manager prior to laying. After delivery, pipe and fittings will be subject to inspection by and approval of the Program Manager. No broken, cracked, misshaped, or otherwise damaged or unsatisfactory pipe, fittings, or damaged concrete lining shall be used and shall be removed and properly disposed of from the job site at no cost to the County. Prior to lowering each section of pipe into the trench, the pipe shall be inspected to ensure the interior is clean and to check for joint scratches, chipped ends, and imperfect gasket seats. 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.
- C. 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.
- D. All pipe, accessories, and specials shall be new material.
- E. If directed by the Program Manager each pipe manufacturer shall furnish the services of a competent factory representative to supervise and/or inspect the installation of pipe. This service will be furnished for a minimum of five (5) days during initial pipe installation.
- F. All pipes shall be subject to inspection by the Program Manager at the place of manufacture. The Contractor shall notify the Program Manager in writing of the

manufacturing start date at least fourteen (14) days prior to the start of manufacturing. The Contractor shall be responsible for all inspection costs.

1.03 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. The Contractor shall inspect pipe materials and fittings upon arrival at the Work Site.
- B. The Contractor shall handle and store pipe materials and fittings to protect them from damage due to impact, shock, shear, or free fall. The Contractor shall not drag pipe and fittings along the ground. The Contractor shall not roll pipe unrestrained from delivery trucks.
- C. The Contractor shall employ acceptable mechanical means to move or handle pipe.
- D. Comply with the storage and handling requirements per manufacturer's recommendations.

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

Reference Specification 01030 – Special Project Procedures.

1.05 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 MATERIALS

- A. All materials used in the construction of gravity flow sanitary sewers shall be new, unused, and in accordance with these contract documents.
- B. All materials shall be in strict compliance with the required standards and specifications including ASTM, ANSI, and AWWA.
- C. At points of the sewer where a change in pipe classification is shown on the Plans, the Contractor may begin 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. In the event the pipe is cut, there shall be no torch cutting, only saw cutting will be allowed.
- D. 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 Contractor shall make every effort to use the same pipe material from manhole to manhole, however if that is not possible then transition joints shall be used. Transition joints between sewer pipes of different materials shall be accomplished by the use of the local municipality's standard for concrete collar walls. Use of

transition joints or any other material shall require approval by the County'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 section 3.5 of this specification.
- B. Manholes shall conform to the requirements of Section 02641 – Precast Concrete Manholes.

2.06 BACKFILL

- A. Pipe backfill materials shall conform to the requirements of Section 02324 – Trenching and Trench Backfilling.
- B. Topsoil shall conform to the requirements of Section 02276 – Site Restoration and Erosion Control.

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall identify the location of all existing underground utilities prior to commencing excavation activities. The Contractor shall consult with the local Call Before You Dig and any utility companies, if necessary, to verify the locations of existing underground utilities.
- B. The Contractor shall notify the agency or company owning any utility line damaged, broken, or disturbed. The Contractor shall obtain approval from the: Program Manager and the utility owner prior to performing any temporary or permanent repairs or relocating utilities.
- C. The Contractor shall install and operate a dewatering system in accordance with the requirements of Section 02205 – Dewatering.
- D. Where wastewater flow diversion is required for the performance of the Work, the Contractor shall provide wastewater flow diversion in accordance with the Section 01520 – Sewer Flow Control.

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. The Contractor is responsible for accurately placing pipe to the exact line and grade shown on the Plans. The control of vertical and horizontal alignments shall be accomplished by the use of a laser beam instrument. When a laser is used, the elevation and alignment of the pipe shall be checked by transit and level rod every fifty (50) feet for pipe smaller than thirty (30) inches and every joint for pipe thirty (30) inches and larger. Other approved methods of controlling vertical and horizontal alignments may be used if specifically authorized by the Program Manager. The pipe section may be adjusted by the use of "come-along" of approved design and anchorage. The practice of bumping or snatching (with backhoe or crane, etc.) used to adjust pipe after placement in the trench, will not be permitted. The Contractor shall furnish all labor and materials necessary for controlling the line and grade.
- B. For external point repairs 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. 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. Before a sewer pipe is placed in position in the trench, the bottom and sides of the trench shall be carefully prepared. Pipe laying shall proceed upgrade, starting at the lower end of the grade and with the bells uphill. Trench bottoms found to be unsuitable for foundations shall be undercut and brought to exact line and grade with pipe cushion, concrete cradles, foundation backfill, or as directed by the Program Manager.
- D. For bell and spigot pipe, bell holes shall be of sufficient size to allow ample room for properly making the pipe joints. Bell holes shall be cut no more than five (5) joints ahead of pipe lying. The bottom of the trench between bell holes shall be carefully graded so the pipe barrel will rest on a solid foundation for its entire length. 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. At no time shall the Contractor open up at more trench than the available pumping facilities are able to dewater. Movement of water tending to erode or affect the trench walls will not be allowed.
- F. As the work progresses, the interior of all pipe in place shall be thoroughly cleaned. After each line of pipe has been laid, it shall be carefully inspected and all earth, trash, rags, and other foreign matter removed from the interior.
- G. Backfilling of trenches shall be started immediately after the pipe is in place and the joints completed, inspected, and approved by the Program Manager.
- H. At times when work is not in progress, open ends of pipe and fittings shall be securely closed, to the satisfaction of the Program Manager, so trench water, earth or other substances will not enter the pipe or fittings.

3.04 JOINT CONSTRUCTION

- A. For bell and spigot pipe, the inside of all bells and the outside of all spigots shall be wiped to remove all dirt, water, or other foreign matter so their surfaces are clean and dry when the pipes are joined.
- B. Rubber ring gasket joints for sewer pipe shall be installed in accordance with the pipe manufacturer's specifications and recommendations. Extreme care shall be used in joining large diameter pipe to avoid damaging the rubber ring or displacing it from the proper operating position.
- C. Joints on ductile iron pipe sewers shall be compression joints, except where mechanical or flanged joints are called for on the Plans and shall be installed in accordance with the pipe manufacturers' specifications and recommendations.
- D. After the joints have been completed, they shall be inspected by the Program Manager before they are covered. Any leaks or defects discovered at any time after completion of the Work shall be repaired immediately. All pipes in place shall be carefully protected from damage until the backfilling operations have been completed. 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 TEE CONNECTIONS

- A. Tee branches shall be installed in sanitary sewer lines at all points shown on the Plans or as directed by the Program Manager. 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 properly connect each existing house and to serve each vacant lot facing or abutting on the street or alley in which the sewer is being laid and at such other locations as may be designated by the County's Representative. 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 Program Manager.
- C. Tees shall be standard manufactured tees.

3.06 CONNECTING RISERS

- A. Where shown on the Plans, included in Special Conditions, or directed by the County's Representative, and 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 Program Manager, connecting risers shall be installed 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. 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 Program Manager. The tee connection shall be installed at the location shown on the Plans, and in accordance with the Detail Drawings. Open ends of connecting risers shall be closed with approved stoppers and be physically restrained. 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.

- C. For more details of the infrastructure acceptance process, review the Infrastructure Acquisition Program document. This document can be found on Department of Watershed Management website under the Consent Decree Program.

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 Program Manager. 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.
- C. Connecting to existing manholes shall be made by coring a hole in the wall of the existing manhole, installing a boot, inserting a minimum length of eighteen (18) feet of pipe into the hole, filling around same with non-shrinking grout and troweling the inside and outside surfaces of the joint to a neat finish.

3.08 TOLERANCES

- A. Invert Elevations: The invert elevations shown on the Plans shall be for the invert at the centerline of the precast concrete manhole. Prior to setting the laser or other vertical alignment control system for the sewer upstream of the manhole, the Contractor shall verify the elevation of the sewer installed at the manhole. 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, the Contractor shall remove and reinstall the sewer at the correct grade at no additional cost to the County.
 - 2. If the sewer is laid at a grade less than shown on the Plans, thus reducing the sewer's capacity, the Program Manager may require the sewer to be removed and re-laid at the correct grade at no additional cost to the County. 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 the sewer is laid at a grade greater than that shown on the Plans, and if the Contractor can show there are no conflicts with upstream existing utilities or obstructions, the Contractor shall adjust the grade of the next upstream manhole so the next upstream manhole shall be set at the correct elevation. If such an adjustment, in the County's opinion, is substantial, the grade adjustment shall be spread over multiple sections of the sewer. If such an adjustment, in the Program Manager's opinion, significantly reduces the sewer's capacity, the Program Manager may require the Contractor to remove and relay that portion of the sewer laid at the improper grade.

3.09 PIPE PROTECTION

- A. Where conditions are not satisfactory, as determined by the Program Manager, the sewer pipe shall be protected with proper pipe protection as shown on the Plans or as directed by the Program Manager.
- B. Plain concrete ditch checks/anchors may be required by the Program Manager on steep slopes in excess of 20 percent and other locations to prevent erosion of the backfilled trench.

3.010 CONCRETE ENCASEMENT

- A. Provide concrete encasement of pipe when directed by the Program Manager or to protect the pipe when any one of the following conditions are encountered:
 - 1. Pipe crosses under a creek;
 - 2. The top of the pipe would have less than 30 inches of ground cover;
 - 3. The trench bottom consists of unstable material.

3.011 FLOWABLE FILL

- A. Furnish and place flowable fill as directed by the Program Manager. Applications include bedding, encasement, and closures for pipe, and general backfill for trenches.
- B. All materials shall conform to the requirements of the Georgia Department of Transportation Specifications, current edition, Section 600 for controlled low strength flowable fill.
- C. The Contractor shall submit mix designs for flowable fill to the Program Manager for approval.

3.012 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. Plugs will be a minimum of 12 inches thick in mains 15-inches and larger and a minimum of 6 inches thick in mains small 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.
 - 3. Plugging method and materials to be approved by the Program Manager.
- C. Sewer laterals shall be cut and capped at the main or property line, as directed by the Program Manager.
- D. Inside of manholes in main sewers remaining in service after the connecting pipes being abandoned have been fully grouted shall be troweled smooth to eliminate pockets in the areas of the abandoned pipes potentially trapping debris and sewer

solids. Any grout in the main sewers and/or manholes remaining in service shall be removed by the Contractor at no cost to the County.

3.013 TESTING

- A. Testing shall be performed in the presence of the Program Manager.
- B. 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. The 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. The Contractor is required to submit the post-installation within forty-eight (48) hours after the completion of the CCTV inspection. The repairs shall demonstrate the full and effective rectification of the extant defect and/or obstruction, including infiltration etc., to the complete satisfaction of the County's Representative. The post construction CCTV inspection is not required for repairs performed prior to pipe-bursting or pipe replacement.

3.014 TELEVISION INSPECTION

- A. Perform television survey in accordance with the requirements of Section 01510 – Sanitary Sewer Main and Lateral Television Sonar Inspection (CCTV). CCTV shall be performed after installation of gravity sewer lines and the reconnection of all active sewer laterals (as applicable). Post-installation CCTV shall be performed for the entire segment, manhole to manhole as indicated in Paragraph 3.6B. The Contractor shall provide PACP coding and data deliverables as required of Section 01510 for any Post-installation CCTV inspection.
- B. Conduct finished inspections continuous over entire length of sewer between manholes within 48 hours of installation.

3.015 CLEANUP

- A. After completing each section of the sewer line, the Contractor shall remove all debris and construction materials and equipment from the Work Site; grade and smooth over the surface on both sides of the line; and leave the entire construction area in a clean, neat, and serviceable condition. 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. The Contractor shall restore the Work Site to the original or better condition in accordance with requirements of Section 02480 – Site Restoration and Erosion Control.
- B. 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.
- C. Any lawns, fences, drainage culverts, or property damaged by the sewer construction shall be repaired or replaced to equal or better condition than existing prior to commencement of the Work.

- D. 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.
- E. All manhole covers shall be brought to grade, as shown on the Plans, or as directed by the County's Representative. Manholes in the unpaved area shall be above grade according to the local municipal Design Standards.

3.016 WARRANTY

- A. The Contractor shall guarantee his work for a warranty period of one (1) year from the date of final acceptance.
- B. Within the warranty period, the Program Manager 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 County. For the localized repairs, the warranty period shall be one additional year.
- C. If the frequency of similar defects requiring repair increases, then the entire project will be re-evaluated.

END OF SECTION

SECTION 02537
DUCTILE IRON SANITARY SEWER PIPE AND FITTINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for the product, installation and testing of ductile iron pipe.
- B. Specifications for ductile iron pipe fittings and applicable ASTM/AWWA code requirements.
- C. Testing and product specifications and requirements for ductile iron pipe.

1.02 RELATED SECTIONS

- D. Section 01520: Sewer Flow Control
- E. Section 02205: Dewatering
- F. Section 02324: Trenching and Trench Backfilling
- G. Section 02535: Gravity Flow Sanitary Sewers

1.03 REFERENCES

- A. ANSI A21.4/AWWA C104 - Cement Mortar Lining for Ductile Iron and Gray Iron Pipe and Fittings, for Water and Other Liquids
- B. ANSI A21.5/AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems
- C. ANSI A21.10/AWWA C110 - Ductile Iron and Gray Iron Fittings, 3-in. through 48-in., for Water and Other Liquids
- D. ANSI A21.11/AWWA C111 - Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings
- E. ANSI A21.15/AWWA C115 - Flanged Ductile Iron Pipe with Threaded Flanges
- F. ANSI A21.50/AWWA C150 - Thickness Design of Ductile Iron Pipe
- G. ANSI A21.51/AWWA C151 - Ductile Iron Pipe, Centrifugally Cast for Water and Other Liquids
- H. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings
- I. ASTM A370 - Standard Test Method and Definitions for Mechanical Testing of Steel Products
- J. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe
- K. ASTM E8 - Tension Testing of Metallic Materials

- L. ASTM E23 – Standard Test Methods for Notched Bar Impact Testing of Metallic Materials
- M. ASTM G62 - Test Methods for Holiday Detection in Pipeline Coatings
- N. AWWA C600 - Standard for Installation of Ductile Iron Water Mains and Their Appurtenances
- O. SSPC-SP6 - Steel Structures Painting Council, Commercial Blast Cleaning

1.04 SUBMITTALS

- A. The Contractor shall submit descriptive details and shop drawings indicating piping layout in plan and elevations as may be required and shall be completely dimensioned. The Drawings shall include a complete schedule of all pipe, fittings, specials, hangers, and supports. Special castings shall be clearly detailed showing all pertinent dimensions.
- B. The Contractor shall provide manufacturers' certifications indicating all ductile iron pipe and fittings meet the provisions of this section and meet the requirements of ANSI A21.51 (AWWA C151). Product certification shall include tensile and Charpy test results traceable to pipe numbers and testing periods. For pipe sizes thirty (30) inches and larger, hydrostatic test charts including pipe numbers for each test cycle shall be furnished as part of the certification test reports. Chemical analysis shall be furnished for each ladle of iron covering each pipe cast and must correlate with the mechanical test results. For pipe sizes thirty (30) inches and larger, complete traceability is required throughout the certification process and must be clearly legible on each pipe at the point of installation. Hydrostatic test results for any size pipe shall be furnished to the Program Manager.
- C. Information on gasket polymer properties.
- D. Tee fabrication details.
- E. Application methods, application requirements, and chemical resistance data for coating and lining products in accordance with manufacturers' recommendations.
- F. Manufacturer's written in-plant quality control program: Quality control procedures and materials testing to be used throughout manufacturing process. Submit prior to manufacture of pipe for this Project.
- G. The Contractor shall provide certifications ensuring all pipe joints have been tested and meet the requirements of ANSI A21.11 (AWWA C151).
- H. The Contractor shall furnish the Program Manager with lists, in duplicate, of all pieces of pipe and fittings in each shipment received. These lists shall give the serial or mark number, weight, class, size, and description of each item received.
- I. At project closeout, the Contractor shall submit record drawings of installed sanitary sewer piping and products.

PART 2 - PRODUCTS

2.01 DUCTILE IRON PIPE

- A. The attention of the Contractor is directed to the provisions of the Conditions of the Contract requiring the inspection and testing of materials to be incorporated into the

Work. All materials to be tested in accordance and meet or exceed the requirements of AWWA C151.

- B. Ductile iron pipe shall be centrifugally cast, manufactured, and tested in accordance with the requirements of ASTM A746 and furnished in minimum eighteen (18) feet to twenty (20) feet lengths unless otherwise approved by the Program Manager. Pipe pressure class will be as directed by the Program Manager; however, minimum pressure shall be Class 350 unless otherwise specified.
- C. Pipe shall be either push-on or mechanical joint type conforming to the latest requirements of the latest revision of ANSI Standard Specifications A21.50/A21.51/AWWA C150/AWWA C151.
- D. Ductile iron pipe shall be manufactured in accordance with ANSI A21.51/AWWA C151; and shall be made of iron having a minimum Grade of 60-42-10.
- E. The weight, pressure class or nominal thickness class, and casting period shall be shown on each pipe. The pipe manufacturer's identifying mark, the year the pipe is produced, and the letters "DI" or "DUCTILE" are to be cast or stamped on the pipe. When specified on the purchase order, initials not exceeding four (4) in number are to be stamped on the pipe. All pipe markings are to be on or near the bell.

2.02 FITTINGS

- A. The Contractor shall use fittings of the same size, lining and coating, and pressure rating as the pipe.
- B. Provide fittings with a body thickness and radii of curvature conforming to the latest ANSI A21.10/AWWA C110 Standard Specifications and joints in accordance with the latest ANSI A21.11/AWWA C110 Standard Specification.
 - 1. Whenever connections are made between ductile iron pipe and pipe of other materials, use of an approved type of transition gasket or coupling is required.
- C. Unless otherwise specified elsewhere in these Specifications or approved by the County's Representative, push-on type pipe shall be used. Ductile iron fittings for push-on pipe shall be designed for the same working pressure, laying conditions, and cover as the pipe which is used.
- D. Fittings manufactured for ductile iron pipe shall conform to the requirements of ANSI A21.10/AWWA C110, unless not made in AWWA C110, and AWWA C153 will be approved.

2.03 JOINTS

- A. Joints for ductile iron pipe shall be push-on type unless mechanical joints are specified elsewhere in these Specifications or approved by the Program Manager. Joints shall be manufactured in accordance with the requirements of ANSI A21.11 /AWWA C111.
- B. For ball and socket joints, the bell, ball, and retainer shall be ductile iron, conforming to the requirements of ANSI A21.11/AWWA C111.
- C. Mechanical Joints:

1. Mechanical joints shall consist of a bolt joint of the stuffing box type as detailed in ANSI A21.10AWWA C110 and described in ANSI A21.11/AWWA C111.
2. Mechanical joints shall be thoroughly bolted in accordance with the manufacturer's recommendations with Tee Head Bolts and bolts of high strength, heat treated cast iron containing 0.50 percent copper or high strength low-alloy steel having a minimum yield point strength of 40,000 pounds per square inch and an ultimate tensile strength of 70,000 pounds per square inch.
3. Gaskets and bolts and nuts shall conform to ANSI A21.11/AWWA C111. Gaskets shall be of neoprene or rubber of such quality that they will not be damaged by the liquid or gases with which they will come into contact.
4. Glands for ductile iron shall be of high strength ductile iron, and glands for cast iron shall be of high strength cast iron.

2.04 EXTERIOR COATINGS AND INTERIOR LININGS

- A. All ductile iron pipe and fittings and cast iron fittings buried underground or submerged shall have a standard bituminous outside coating conforming to A21.51/AWWA C151. All exposed ductile iron pipe and ductile iron and cast iron fittings shall have an outside coating of universal primer.
- B. All ductile iron pipe used for wastewater shall have cement mortar lining of standard thickness in accordance with ANSI A21.4/AWWA C104. Cement mortar lining for cast iron and ductile iron fittings shall be double the standard thickness under ANSI A21.4/AWWA C104, unless specified by the County's Representative may require a Calcium Aluminate or Ceramic Epoxy Lining.
- C. No lining shall be provided for ductile iron pipe and ductile iron and cast iron fittings used for air.

2.05 POLYETHYLENE ENCASEMENT

- A. Point Repairs are to be wrapped in polyethylene encasement.
- B. Contractor will use polyethylene encasement for corrosion protection system for Ductile and gray-iron pipe when directed by the Program Manager. However, other options should be considered for uniquely severe environments as defined in ANSI/AWWA C105/A21.5.
- C. Polyethylene encasement is to be specifically manufactured to meet the formulation, physical tests, thickness, and dimensional requirements specified in standard ANSI/AWWA C105/A21.5.
- D. Low density film is to be 8 mil minimum, group 2, linear low density, flat tube, is to be virgin polyethylene raw material conforming to ASTM D4976. Provide tubes for straight pipe and sheets for fittings or tees. The film is marked showing trademark, year of manufacture, type of resin, specification conformance, applicable pipe sizes and the words "warning corrosion protection-repair any damage."

Property	Minimum Strength	Standard
Tensile Strength	3600 psi	ASTM D882
Elongation	800%	ASTM D882
Dielectric Strength	800 V/ mil	ASTM D149
Impact Resistance	600 g	ASTM D1709-B
Propagation Tear Resistance	2550 gf	ASTM D1922

2.06 SPARE PARTS

- A. The Contractor shall furnish four (4) spare gaskets for each size and type of joint requiring the use of a gasket. The Contractor shall furnish eight (8) bolts and nuts of each size and type used for mechanical and flange joint.

2.07 MATERIAL TESTING

- A. The County's Representative may elect to visit pipe manufacturer's plant and inspect pipe in production, testing, and shipping in accordance with ANSI A21.5/AWWA C151. Reasonable facilities shall be provided for the County or the Program Manager to facilitate their work while at the manufacturing facility. All production and quality assurance records shall be made available for review by the Program Manager upon request.
- B. The manufacturer shall perform all tests in house as part of their quality assurance/quality control. Test results shall be submitted to the County's Representative in accordance with the requirements of this section.

PART 3 – EXECUTION

3.01 GENERAL

- A. At no time will any gravity sanitary sewer construction commence prior to approval of all plans, receipt of all required documents including necessary easements and permits and a Preconstruction Conference held with the Program Manager.
- B. All gravity sanitary sewer lines, manholes, and other appurtenances to be governed by the County shall be installed according to approved plans and profiles. If a field change must occur, the redesigned area(s) must be submitted for approval prior to installation, in accordance with Georgia Environmental Protection Division's Rules and Regulations for Water Quality Control, Chapter 391 3 6 .02 (10). Contractor must have a set of the "approved" design containing an original County stamp, and a copy of these Design Standards, current edition, on site at all times.
- C. Contractor shall adhere to all Federal, State, County and local laws, ordinances and regulations affecting the conduct of the work, including but not limited to initiating, maintaining and supervising all safety precautions and programs in connection with the work.
- D. Sanitary sewer construction shall be done in open trenches and in a manner to protect lines, sanitary sewers or structures from unusual stresses.

- E. The Contractor shall provide for the flow of all sanitary sewers, drains or creeks interrupted during the progress of the Work and shall restore same to preconstruction condition.
- F. At the start of construction, the Contractor shall install an air plug in the first pipe laid out of the entrance manhole and in the downgrade side of the first newly installed manhole. Said plugs shall remain in place until final inspection and approval is given by the Program Manager. Contractor must exercise extreme caution to ensure plugs are not lost into the gravity sanitary sewer system.
- G. The Contractor must comply with all requirements of the local Municipality's Soil Erosion and Sediment Control Ordinance, the provisions of the State Manual for Erosion and Sediment Control and any special conditions required by the EPD associated with any variances issued by the same, and any special conditions required by the Program Manager.

3.02 DUCTILE IRON PIPE

- A. The Contractor shall conform to the installation requirements of Section 02535 - Gravity Flow Sanitary Sewers.
- B. Join pipe with push-on joints and mechanical joint fittings in accordance with manufacturer's recommendations and applicable sections of AWWA C600.
- C. Provide special tools and devices, such as special jacks, chokers, and similar items required for installation.
- D. Lubricate pipe gaskets using lubricant furnished by pipe manufacturer unless otherwise approved by the Program Manager.
- E. Clean ends of fittings of dirt, mud, and foreign matter by washing with water and scrubbing with a wire brush, after which, slip gland and gasket on plain end of pipe. If necessary, lubricate end of pipe to facilitate sliding gasket in place, then guide fitting into spigot of pipe previously laid.
- F. Gaskets per AWWA C111. Lubricant shall be supplied by the particular manufacturer and approved by the County's Representative.

3.03 FITTINGS

The Contractor shall install fittings in accordance with applicable ANSI/AWWA standards and manufacturers' recommendations.

3.04 TESTING

- A. Testing for point repairs shall be completed using CCTV inspection per section 01510 – Sanitary Sewer Main Television and Sonar Inspection and section 02535 – Gravity Flow Sanitary Sewers. Pipe not considered to be a point repair test shall follow the specifications herein. Conduct finished inspections continuous over entire length of sewer between manholes within 48 hours of installation. The Contractor shall provide PACP coding and data deliverables as required of Section 01510 for any Post-installation CCTV inspection.
- B. Each end of each pipe (each pipe socket and pipe spigot) shall be measured and shall conform to the standard dimensions of ANSI A21.51/AWWA C151. In addition, each socket and spigot shall be inspected in a well-lighted area for injurious defects

potentially affecting joint performance. Such defects may be removed by cutting off pipe ends. Pipe with injurious defects in the bell must be scrapped.

- C. Following the installation of ductile iron pipe, the Contractor shall test all sewer pipe & joints in accordance with AWWA standards. Failure of testing is subject to rejection, repair, or replacement at the Contractor's expense.

END OF SECTION

SECTION 02542
SILT FENCE

PART 1 – GENERAL

1.01 SECTION INCLUDES

The work covered by this Section consists of furnishing all materials, equipment, and labor and performing all operations in connection with the construction of the Silt Fence System in accordance with the Contract Documents.

1.02 RELATED SECTIONS

- A. Section 01300: Submittals
- B. Section 02276: Site Restoration and Erosion Control

1.03 QUALIFICATIONS

- A. Contractor and Applicator shall have all state erosion control certifications and be active at the time of installation.
- B. Installation shall be by an experienced applicator approved by the manufacturer of the material supplied.
- C. Applicator shall have a minimum of one year experience.
- D. Submit written proof of qualifications to the Program Manager.
- E. The woven fiber filter and appurtenances specified under this Section shall be furnished by a manufacturer who is fully experienced, reputable, and qualified in the manufacture of the fabric furnished. The woven fiber filter and all related appurtenances shall be designed, constructed and installed with the best practices and methods.

1.04 SUBMITTALS

- A. Furnish sample 36 by 36 inches for each fabric, as specified in Section 01300.
- B. Furnish composite filter media sock sample 36 inches in length.
- C. Final acceptance of fabric and socks shall be contingent upon approval of samples.
- D. Furnish an affidavit that all materials comply with these Specification requirements.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Prevent damage during delivery and handling.
- B. Store all fabric in undamaged condition as packaged by the manufacturer, with manufacturer's seals and labels intact.

- C. Store all materials in a clean, dry storage area.
- D. Do not store fabric in an upright position.
- E. Storage area temperature shall be maintained above 40 degrees F. with normal humidity.

PART 2 – PRODUCTS

2.01 POST SIZE

Type	Min Length	Type of Post	Size of Post
NS	4'	Soft wood	3" dia or 2x4
		Oak	1.5" x1.5"
		Steel	1.3lb./ft. min
S	4"	Steel	1.3lb./ft. min
		Oak	2"x2"

2.02 FABRIC – Sd1

- A. The filter fabric shall be designed to control water seepage of the fine particle and or soil without clogging under varying water flow conditions, thereby serving as a soil stabilizer.
- B. The filter fabric shall be chemically resistant to prolonged exposure to fresh water, and either alkaline or acidic soil conditions.

C. Physical Properties:

TEST METHOD

1.	Color	Black
2.	Weight, oz./sq. ft.	0.8 ASTM D-1910
3.	Equivalent opening size	70-100 CE-1310
4.	% open area	4-10 CE-1310
5.	Tensile Strength, #	400 x 280 ASTM D-1682
6.	Elongation, %	34 x 32 ASTM D-1682
7.	Trapezoidal tear strength, #	92x 40 ASTM D-2263
8.	Mullen burst, psi	510 ASTM D-751
9.	Puncture Strength, #	150 ASTM D-751-MS
10.	Abrasion resistance	ASTM D-01175-71
	Abraded strength, #	80 ASTM D-1682

11. Weather-Ometer strength retention, %	90 ASTM E-42-69
12. Water permeability, water flow rates*, milliliters/min.	
6" head	460-520 Canvas Products
8" head	620-760 Assn.Intern'l
36" head	2510-2790 Test Method (for canvas)

*Water flow perpendicular to fabric

- D. The upper level of the fabric form work edges shall be structured so as to accommodate the type of anchorage to be utilized at that point.
- E. Individual mill-width panels shall be cut to suitable lengths, and the two layers of fabric separately jointed, edge-to-edge, by means of heavy, double-stitched nylon thread. The tensile strength of stitched joints shall not be less than 100 lbs. /inch.

2.03 FASTENERS

Table 6-27.3 Fasteners for Wood Posts				
	Gauge	Crown	Legs	Staples / Post
Wire Staples	17 min.	3/4" wide	1/2" long	5 min.
	Gauge	Length	Button Heads	Nail/ Post
Nails	14 min.	1"	3/4"	4 min.
Note: Filter Fabric may also be attached to the post by wire, anchors, and pockets or any other method provided minimum P-factor, as required by GSWCC, is met.				

2.04 COMPOST FILTER MEDIA SOCK

- A. Compost used for compost filter sock filler material (filter media) shall be weed free and derived from a well-decomposed source of organic matter. The compost shall be produced using an aerobic composting process meeting CFR 503 regulations including time and temperature data. The compost shall be free of any refuse, contaminants or other materials toxic to plant growth. Non-composted products will not be accepted. Test methods for the items below should follow US Composting Council Test Methods for the Examinations of Composting and Compost guidelines for laboratory procedures:
 1. PH – 5.0-8.0 in accordance with TMECC 04.11-A, “Electrometric pH Determinations of Compost”

2. Particle size – 99% passing in a 2 in (50mm) sieve and a maximum of 40% passing a 3/8 in (9.5mm) sieve, in accordance with TMECC 02.02-B, “ample Sieving for Aggregate Size Classification.” *(Note- In the field, product commonly is between ½ in [12.5mm] and 2 in [50mm] particle size.)*
3. Moisture content of less than 60% in accordance with standardized test methods for moisture determination.
4. Material shall be relatively free (<1% by dry weight) of inert or foreign man made materials.
5. A sample shall be submitted to the Program Manager for approval prior to being used and must comply with all local, state and federal regulations.

Table 2.		
Material Type	Multi-Filament Polypropylene	Multi-Filament Polypropylene
Material Characteristic	Photodegradable	Photodegradable
Mesh Opening	3/8 in (10mm)	1/8 in (3mm)
Tensile Strength (ASTM 5035-95)	44 psi (3.09 kg/cm ²)	202 psi (14.2 kg/cm ²)
% Original Strength from Ultraviolet Exposure (ASTM G-155)	100% at 1000 hr.	100% at 1000 hr.

Table 3.	
	12 in (300mm) Diameter
Effective Circumference	38 in (960 mm)
Density (when filled)	32 lbs./ft. (50kg/m)
Air Space	20%
Hydraulic Flow Through Rate	11.3 gpm/ft. (141 L/min/m)
P Factor (RUSLE)	0.1-0.32

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Installation instructions shall be supplied by the manufacturer. The fabric shall be applied in accordance with the manufacturer's recommendations.
- B. The surfaces to be protected shall be prepared and graded to the extent they are normally stable in the absence of erosion forces. All stones, roots, and other waste

material exposed on the slopes which could disturb the finished mat profile shall be removed. The fabric shall be positioned over these surfaces.

C. Construction Specifications

1. The compost filter sock shall be installed according to this specification, as shown on the plans or as directed by the Program Manager. For installation of the compost filter sock see the construction documents.
 - a. Compost filter socks should be installed parallel to the base of the slope or other disturbed area. In extreme conditions (i.e., 2:1 slopes), a second compost filter sock shall be constructed at the top of the slope.
 - b. Stakes shall be installed through the middle of the compost filter sock on 10 ft. (3m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft. (1m) wooden stakes. In the event staking is not possible, i.e., when compost filter socks are used on pavement, heavy concrete blocks shall be used behind the compost filter socks to help stabilize during rainfall/runoff events.
 - c. Staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.
 - d. Loose compost may be backfilled along the upslope side of the compost filter sock, filling the seam between the soil surface and the device, improving filtration and sediment retention.
 - e. If the compost filter sock is to be left as a permanent filter or part of the natural landscape, it may be seeded at time of installation for establishment of permanent vegetation. The engineer will specify seed requirements.
 - f. Compost filter socks are not to be used in perennial, ephemeral, or intermittent streams.
2. **Maintenance:** Sediment shall be removed once it has accumulated to one-half the original height of the barrier. Compost filter socks shall be replaced whenever it has deteriorated to such an extent the effectiveness of the compost filter sock is reduced. Compost filter socks shall remain in place until disturbed areas have been permanently stabilized. All sediment accumulation at the compost filter sock shall be removed and properly disposed of before the compost filter sock is removed.

D. Silt Fence

3. **Non-sensitive areas**

Sediment barriers being used as Type NS shall have a support spacing of no greater than 6 feet on center, with each driven into the ground a minimum of 18 inches. Type NS sediment barriers shall have a P-factor no greater than 0.045.

4. **Sensitive areas**

Sediment barriers being used as Type S shall have a support spacing of no greater than 4 feet on center, with each driven into the ground 18 inches. Type S sediment barriers shall have a P-factor no greater than 0.030.

5. **Installation**

- a. Sediment barriers should be installed along the contour.
- b. Temporary sediment barriers shall be installed according to the following specifications as shown on the plans or as directed by the design professional.
- c. Post installation shall start at the center of a low point (if applicable) with the remaining posts spaced no greater than 6 feet apart for Type NS sediment barriers and no greater than 4 feet apart for Type S sediment barriers. For post size requirements, see Table 6-27.2. Fasteners for wood posts are listed in Table 6-27.3.

6. **Static Slicing Method**

The static slicing machine pulls a narrow blade through the ground to create a slit 12" deep, and simultaneously inserts the silt fence fabric into this slit behind the blade. The blade is designed to slightly disrupt soil upward next to the slit and to minimize horizontal compaction, thereby creating an optimum condition for compacting the soil vertically on both sides of the fabric. Compaction is achieved by rolling a tractor wheel along both sides of the slit in the ground 2 to 4 times to achieve nearly the same or greater compaction as the original undisturbed soil. This vertical compaction reduces the air spaces between soil particles, which minimizes infiltration. Without this compaction infiltration can saturate the soil, and water may find a pathway under the fence. When a silt fence is holding back several tons of accumulated water and sediment, it needs to be supported by posts that are driven 18 inches into the soil. Driving in the posts and attaching the fabric to them completes the installation.

7. **Trenching Method**

- a. Trenching machines have been used for over twenty-five years to dig a trench for burying part of the filter fabric underground. Usually the trench is about 2'-6" wide with a 6" excavation. Post setting and fabric installation often precede compaction, which make effective compaction more difficult to achieve. EPA supported an independent technology evaluation (ASCE 2001), comparing three progressively better variations of the trenching method with static slicing method. The static slicing method performed better than two lower performance levels of the trenching method, and was as good as or better than the trenching method's highest performance level. The best trenching method typically required nearly triple the time and effort to achieve results comparable to the static slicing method.
- b. **Along all state waters and other sensitive areas, two rows of Type S sediment barriers shall be used. The two rows Type S should be placed a minimum of 36 inches apart.**

3.02 MAINTENANCE

- A. Sediment shall be removed once it has accumulated to one-half the original height of the barrier. This is extremely important when selecting BMPs with a lower profile.
- B. Sediment barriers shall be replaced whenever they have deteriorated to such an extent that the effectiveness of the product is reduced (approximately six months) or the height of the product is not maintaining 80% of its properly installed height.
- C. Temporary sediment barriers shall remain in place until disturbed areas have been permanently stabilized. All sediment accumulated at the barrier shall be removed and properly disposed of before the barrier is removed.

END OF SECTION

SECTION 02607
MANHOLE HEIGHT ADJUSTMENT

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This specification section provides the requirements for the adjustment of height of manholes whose tops are below grade. These manhole height adjustments can facilitate sanitary sewer operation, maintenance and assessment activities.

1.02 RELATED SECTIONS

- A. Section 01056: GPS Data Collection
- B. Section 01300: Submittals
- C. Section 01520: Sewer Flow Control
- D. Section 01700: Project Closeout
- E. Section 02276: Site Restoration and Erosion Control

1.03 REFERENCES

- A. ASTM C32 - Standard Specification for Sewer and Manhole Brick (Made From Clay or Shale).
- B. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
- C. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
- D. ASTM A536 - Standard Specification for Ductile Iron Castings
- E. AASHTO M306
- F. ASTM C270 – 12a Standard Specification for Mortar for Unit Masonry
- G. Manual for Uniform Traffic Control Devices (MUTCD) standards
- H. “Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards”, Current Edition, DeKalb County Department of Watershed Management.

1.04 SUBMITTALS

- A. The Contractor shall submit shop drawings and product data in accordance with the requirements of the Submittals section of these Specifications and those requirements outlined in Specifications Section 01300.
- B. The Contractor shall complete a daily written record detailing the work carried out and any 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 (quantity, time, duration), sunny, windy, etc.].
 3. **Equipment:** On site (e.g., specialty cleaning, by-pass equipment, etc.).
 4. **Submittals:** To the County's Program Manager or as directed in the submittals portion of these specifications.
 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, but not limited to, collapsed pipe, if any, cave-ins, sink holes, etc.
 9. **Visitors:** On site, time in and out.
 10. **Disposals:** Type and quantity of debris (including liquids).
- C. Ring Product submittal and manufacturer's specifications.
 - D. Frame and Cover and/or Cone Product submittal and manufacturer's specifications
 - E. Traffic safety plan and procedures for Right-of-Way work.
 - F. DOT Documents for permit.

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

- A. Reference Specification Section 01030 – Special Project Procedures.

1.06 SAFETY

- A. All work shall be performed in accordance with OSHA, Local and State DOT standards local, state and federal safety regulations.
- 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. **Traffic Control:** All traffic control measures shall comply with the requirements of MUTCD, Part 6 – Temporary Traffic Control, Latest Edition as published by USDOT/FHWA.

PART 2 – PRODUCTS

2.01 BRICK

- A. Brick shall conform to the requirements of ASTM C32 for grade SM. Bricks shall conform to the following dimensions, unless otherwise approved by the County's Program Manager:

	Depth (inches)	Width (inches)	Length (inches)
Standard Size	2¼	3¾	8
Allowable Variation	±¼	±¼	±½

- B. All brick shall be new and whole, of uniform standard size, and with substantially straight and parallel edges and square corners. Bricks shall be of compact textures, burned hard entirely through, tough and strong, free from injurious cracks and flaws, and shall have a clear ring when struck together. No soft or salmon brick shall be used. Brick shall be culled after delivery, if required, and no culls shall be used except at such places, to such extent, and under such conditions as may be approved by the County’s Program Manager.

2.02 PRECAST BARREL JOINTS & CONES

- A. Barrel joints shall be tongue and groove and shall meet the latest revision of ASTM C443 for O-ring gaskets; see Standard Detail S-003 in Appendix I of *“Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards”*, 2009 Edition, Version 1.0, DeKalb County Department of Watershed Management. All barrel joints shall be installed to allow no infiltration into the manhole. Care should be exercised during the handling of the precast units to avoid disturbing or damaging the gasket and to attain proper alignment of the joints. Pre-formed flexible joint sealants shall not be used on sanitary sewer manholes. Joints and lift holes shall be grouted smooth with cement grout on inside and outside. In precast manhole construction, combination of joint lengths shall be selected to minimize the number of individual segments required to provide the total depth specified. Long joints shall be used in the bottom with shorter segments utilized for the top adjustments.
- B. Manhole cones shall be precast concrete. The top elevation of manhole frames shall be adjusted to grade in areas such as streets, alleys, and parking lots or where indicated by the Program Manager. A maximum adjustment of eight (8) inches will be allowed for precast concrete adjusting rings. Adjustments greater than twelve (12) inches must be made by changing precast riser sections. The top of the wall of all manholes shall be leveled off with mortar so as to form a flat surface upon which the manhole frame is to rest.

2.03 MORTAR

- A. The Contractor shall use mortar meeting the requirements of ASTM C270 Type S unless directed and approved otherwise by the Program Manager.
- B. The Contractor shall prepare mortar only in quantities needed for immediate use. Mortar mixed for more than thirty (30) minutes or greater than the manufacturers limits, whichever is more restrictive, which has set, or which has been re-tempered shall not be used.

2.04 METAL RISER RING

- A. **Cast Iron:** New cast iron riser rings shall be of domestic origin, conform to the latest edition of AASHTO M306. Contractor shall use cast iron riser rings for reconstruction and/or adjustment of the manhole frame and cover of less than 4 inches.

2.05 FRAMES & COVERS

- A. Manhole frames and covers shall conform to the requirements outlined in Section III of *“Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards”*, Current Edition, DeKalb County Department of Watershed Management. The County will provide standard castings at no cost to the Contractor for manholes requiring replacement rings and covers.

PART 3 – EXECUTION

3.01 GENERAL

- A. The Contractor shall take all necessary measures to prevent debris from entering the manhole under reconstruction. A temporary (waterproof) cover shall be required during the reconstruction period.
- B. The Contractor shall take all necessary measures to prevent damage to the existing manhole frame and cover during the adjustment work.
- C. In the event the existing manhole is located within a paved area, the Contractor is required to replace existing manhole frame and cover with a traffic manhole frame and cover (castings provided by the County) and concrete collar in accordance with DeKalb Standard Detail #S-007. The Contractor is also required to provide a traffic safety plan to the Program Manager if the paved area is within the roadway Right-of-Way.
- D. **Riser Rings:** The Contractor shall replace existing, deteriorated riser rings with new precast concrete riser rings and/or cast iron riser rings. All manholes designated to receive casting adjustment and/or alignment shall be adjusted to meet existing finished grade unless an alternative elevation is specified. A cementitious mortar shall be placed in between individual precast concrete riser rings, and precast concrete riser ring and cone joints. The mortar shall be struck smooth with the interior surface of the manhole and floated with a sponge float to a surface profile of 8-10 mils. An epoxy system designed for metal-to-metal adhesion shall be used to connect individual cast iron riser rings and the cast iron riser rings to the frame. Prior to backfilling, rubber external seal wraps shall be applied to the cone and manhole section joint, riser rings and frame.
- E. **Manhole Frame and Cover:** Existing frames and covers removed to facilitate manhole rehabilitation, riser reconstruction, and/or casting alignment or grade adjustments shall be salvaged and cleaned by the Contractor for replacement unless determined to be defective by the Program Manager. If manhole frame and/or cover are determined to be defective, Contractor shall replace with new frame and cover. Replacement frames and covers shall be furnished by the County and installed by the Contractor as approved by the County and Program Manager in accordance with this specification section. Frames shall be set in full mortar bed. The mortar shall be struck smooth with the interior surface of the manhole and floated with a sponge float to a surface profile of 8-10 mils.
- F. **Manhole Cover:** Existing manhole covers removed to facilitate manhole condition investigation and rehabilitation shall be cleaned by the Contractor for replacement unless determined to be defective. If the manhole cover is determined to be defective, or if the manhole lid is vented and is assigned to be replaced the Contractor shall replace with a new cover. Replacement covers shall be furnished by

the Owner and installed by the Contractor as approved by the Owner and Program Manager in accordance with this specification section.

3.02 PROCEDURES FOR MANHOLE HEIGHT ADJUSTMENT

- A. The Contractor shall utilize maps, surveys, sounding instruments, or information from local residents to determine approximate locations of buried manholes. Manholes shall be exposed utilizing hand techniques or by carefully probing with mechanical equipment. Manhole exposure in paved areas shall be accomplished by making a square cut in the surface with sufficient width to allow for the excavation of the material around the manhole to expose it to a depth necessary for adequate adjustment.
- B. Raising Manholes:
1. The Contractor shall adjust the top elevation of the manhole frame to grade as directed by the Program Manager conforming to the requirements of this section. A maximum adjustment of twelve (12) inches will be allowed using brick and mortar. Mortar shall be applied to create a smooth finish on the interior and exterior prior to backfill. Adjustments greater than twelve (12) inches shall be made by removing the cone section and adding the appropriate precast riser section.
 2. In green (grass) areas, vertical height adjustments can be made using concrete adjustment (riser) rings in lieu of brick and mortar. A maximum adjustment of eight (8) inches will be allowed using riser rings. Adjustments greater than twelve (12) inches shall be made by removing the cone section and adding the appropriate precast riser section. The number of riser rings shall be limited to the minimum number that is required to achieve grade.
 - a. Joint sealant shall be applied on existing manhole frame and each joint of the riser ring(s) required to achieve grade. If the outdoor temperature is below 70 degrees Fahrenheit, the Contractor must heat the joint sealant before application.
 - b. The Contractor shall place concrete (Class B) collar (8 inch at the bottom of the frame to 2 inch at the top of the frame) on exterior of the manhole frame. The concrete collar on exterior of the manhole frame shall receive a broom finish.
 3. When a manhole height adjustment is performed in a paved area and the manhole is not to be rehabilitated by any other method, then the Contractor shall install a manhole frame seal in accordance with the requirements of these Specifications.
- C. Lowering or raising manholes in paved and green areas require the removal of the manhole cone:
1. If the vertical height adjustment of the existing manhole is greater than 12 inches or the existing manhole must be lowered, the Contractor shall remove the manhole cone section to the straight barrel section of the existing manhole.
 2. The manhole frame and cover shall be removed from the existing manhole.

3. The Contractor shall remove the manhole cone by either the saw cut method or explosive (shot) cord method.
4. The Contractor shall prepare the existing manhole barrel for the re-construction of the cast-in-place manhole as shown on the standard details.
5. The Contractor shall re-construct the cast-in-place concrete manhole as shown on the standard details.
6. If the manhole frame is not reset as part of the cast-in-place concrete manhole pour, the Contractor shall apply a 1½ inch bed of concrete (Class B) for the re-install the manhole frame on the cast-in-place concrete manhole. The Contractor shall also place concrete (Class B) collar (8 inch at the bottom of the frame to 2 inch at the top of the frame) on exterior of the manhole frame. The concrete collar on exterior of the manhole frame shall receive a broom finish.

D. Raising Brick Manholes

1. The manhole shall be carefully demolished down to the straight section of wall and shall be consistent with a level point of brick coursing.
2. The cut line for the demo shall be made with a masonry saw or other approved method that will minimize disturbance of the remaining brick and mortar.
3. All mortar shall be removed from the top of the remaining brick without disturbing the remaining mortared joints.
4. Extend manhole walls using ASTM C32 grade SM brick and Type S mortar.
5. All work shall comply with the applicable requirements of the “Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards”, 2009 Edition, Version 1.0, DeKalb County Department of Watershed Management.

E. Raising Cast In Place Manholes

1. The manhole shall be carefully demolished down to the straight section of wall and shall be consistent with a level point of cut.
2. Work shall be in accordance with ACI 350R.
3. Concrete shall have a minimum 28 day strength of 4000 PSI and conform to ASTM C94.
4. All reinforcing steel shall be fabricated and installed in accordance with applicable portions of ACI 318.
5. All form work shall be in accordance with applicable portions of ACI 347R.
6. The extension of the wall shall be connected to the existing structure using adhesive dowels of the size and location on approved shop drawings.
7. All work shall comply with the applicable requirements of the “Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main

3.03 CLEANUP

- A. After the work is completed and all testing acceptable, the Contractor shall clean up the work area in accordance with these specifications.
- B. 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 County 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.
- C. 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 County’s Program Manager. The work site restoration work shall be completed in accordance with the requirements of these Specifications.

3.04 RECORD DRAWINGS

- A. Unless noted otherwise, Record Drawings shall provide dimensions, distances and material type.
- B. Unless noted otherwise, Record Drawings shall provide elevations to the nearest 0.01 ft. for all pertinent items constructed by Contractor.
- C. At contract closeout, deliver Record Documents to the Program Manager for the County.
- D. Accompany Submittal with transmittal letter, in duplicate, containing:
 - 1. Date
 - 2. Project title and number
 - 3. Contractor's name and address
 - 4. Title and number of each record document
 - 5. Signature of Contractor or Contractor's authorized representative
- E. Record Drawings Plan Submittal
 - 1. The following Datum shall be used:
 - a. Vertical: NAVD 88
 - b. Horizontal: NAD 83 (modified to ground)
 - i. Conversion factor shall be provided to convert back to State Plane (grid)
 - 2. There are 2 STEPS to follow in order to complete the Record Drawing process:
 - a. **Step 1** – Draft Plan Submittal and Review
 - b. **Step 2** – Final Plan Submittal

Following Program Manager’s review of the draft submittal, the Contractor will then prepare the final submittal package based on the

County and Program Manager's review comments and submit to the County. The final submittal package shall include the following items:

- i. Two bound, signed, half-sized print sets (11" x 17")
 - ii. A disc containing both digital file (latest version of AutoCAD) and .pdf files
 - iii. Digital drawings shall include appropriate line types/styles per the County's CAD Standards.
- F. Reference Section 01056 for Contractor responsibilities related to GIS updates to update manhole locations within the mapping inventory. This applies to newly discovered assets or assets with significant locational discrepancies.
- G. Record Drawings shall be reproducible, shall have a title block indicating the drawings are Record Drawings, the name of the company preparing the Record Drawings, and the date the Record Drawings were prepared.
- H. Legibly mark drawings to record actual construction, including:
1. All Construction:
 - a. Changes of dimension and detail.
 - b. Exact direction and location of existing and new utilities where field location varies from GIS drawing provided by the County for the project.
 2. Site Improvements, Including Underground Utilities:
 - a. Horizontal and vertical locations of all exposed and underground utilities and appurtenances, both new facilities constructed and those utilities encountered, referenced to permanent surface improvements.
 - b. Location and dimensions of roadways and parking areas, providing dimensions to back of curb when present.
 - c. The locations shall be referenced to at least two easily identifiable, permanent landmarks (e.g., power poles, valve markers, etc.) or benchmarks.
 - d. The Record Drawings shall include the horizontal angle and distance between manhole covers.
 3. Structures:
 - a. Depths of various elements of foundation in relation to finish first floor datum or top of wall.
 - b. Location of internal and buried utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

3.05 WARRANTY

- A. The Contractor shall guarantee the work for a warranty period of one (1) year from the date of final written acceptance of the County. If, at any time during the warranty period, any defect is identified the Contractor shall make repairs acceptable and at no additional cost to the County. In this case, the Contractor shall warrant the work

for one (1) year in addition to the warranty required by the Contract from the date of repairs' final written acceptance.

- B. If the frequency of similar defects requiring repair increases, then the entire project will be re-evaluated for warranty extensions.

END OF SECTION

SECTION 02608
MANHOLE FRAME AND COVER INSTALLATION

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This section includes procedures for Manhole Frame and Cover Installation.

1.02 REFERENCES

- A. The following is a partial listing of reference standards that could be applicable to this specification. This should not be considered an exhaustive list. Other standards should be applied when applicable.
- B. ASTM
 - 1. A48 / A48M - Standard Specification for Gray Iron Castings.
 - 2. A536 - Standard Specification for Ductile Iron Castings
- C. Manual for Uniform Traffic Control Devices (MUTCD) standards
- D. Potable Water Main, Gravity Sanitary Sewer, and Sanitary Sewer and Force Main Design Standards, DeKalb County Department of Watershed Management.

1.03 SUBMITTALS

- A. Submittals shall conform Section 01300 Submittals. Submit shop drawings of manhole frames and covers to the Program Manager for approval before installation.

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

- A. Reference Specification Section 01030 – Special Project Procedures

1.05 SAFETY

- A. All work shall be performed in accordance with OSHA standards and local, State and Federal safety regulations.
- B. No person shall enter a confined space without the documented requisite training, certification, and entry permit.
 - 1. Entry plan is also required.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Install complete manhole covers and frames at each new sanitary sewer manhole, and in all other locations shown on the Plans or directed by the Program Manager. Frames and covers will be provided by DeKalb County.

- B. Manhole covers shall be of either Standard Type or Bolt-Down Type, as indicated on the Plans or as otherwise specified. If not otherwise indicated, manhole covers shall be Standard Type.
- C. The Contractor shall provide manhole covers and frames approved by the Program Manager.

2.02 MATERIALS

- A. Manhole covers and frames shall be constructed of cast iron conforming to the requirements of ASTM A48 Class 30.
 - 1. Tensile strength of the cast iron shall be a minimum of 30,000 psi.
 - 2. Covers and frames shall be "Heavy Duty" type, rated for a minimum of H-20 loading.
- B. All castings shall be sound, smooth and clean, and free of blisters, pits, cracks, and other defects.
 - 1. Castings judged to be defective by the Program Manager will be rejected, and shall be replaced by the Contractor at no additional cost to the Owner.
 - 2. Casting tolerances shall be $\pm 1/16$ -inch, with an additional one-sixteenth ($1/16$) inch per foot of dimension.
 - 3. Covers shall not rock or chatter" when in-place in frames
- C. Manhole covers shall be cast with two (2) non-penetrating type pick-holes, located as indicated in the Detail Drawings.
 - 1. Pick-holes shall conform to the dimensions indicated in the Detail Drawings.
 - 2. Manhole covers shall not have vent holes.
- D. The seating surfaces of frames and covers shall be machined flat to ensure contact between the cover and frame along the full perimeter.
- E. Gaskets shall be provided and installed on all manhole frames.
 - 1. Secured to the seating surface of the frame with non-degrading glue by the manufacturer.
 - 2. Be flat, one-eighth- ($1/8$) inch thick, black neoprene, with a tensile strength of 2,000 psi.
- F. For manhole covers indicated as Bolt-Down Type, frames shall be cast and machined to accept four (4) cover bolts, on the pattern shown in the Detail Drawings.
 - 1. Covers shall be cast with four (4) holes, three-quarter ($3/4$) inch diameter, for the bolts on the pattern shown in the Detail Drawings.
 - 2. Bolts shall be stainless steel hex-head cap screws, and shall be provided with all bolt-down type covers.
 - 3. Bolts shall include stainless steel washers and rubber sealing gaskets.

- G. Covers and frames shall bear the emblem of "Sewer" as illustrated in the Detail Drawings.
- H. Covers and frames shall conform to 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.

PART 3 – EXECUTION

3.01 PROCEDURES FOR MANHOLE FRAME AND COVER INSTALLATION

- A. Contractor Shall:
 - 1. Prepare the manhole top cone for frame installation per manhole and manhole cover manufacturer recommendations.
 - 2. Prepare and install manhole frames and covers per manufacturer recommendations.
 - 3. Check the installation and condition of gaskets and replace all missing or damaged gaskets.
 - 4. Install new frames and covers to the required elevations shown on the Plans or to the existing grade as directed by the Owner's Representative.
 - 5. Check the manhole covers for fit in the frame.
 - a. If a manhole cover is either excessively loose or tight in the frame, or rocks, wobbles, or otherwise moves in its frame, the frame and cover shall be removed and replaced by the Contractor at no additional cost to the Owner.
 - 6. Install and tighten all Bolt-Down Type covers.

3.02 CLEANUP

- A. After the work has been completed and all testing acceptable, the Contractor shall clean up the work area.
 - 1. The work area shall be left in a condition equal to or better than prior condition.
 - 2. Disturbed grassed areas shall be seeded or sod placed as directed by the Program Manager at no additional cost to the Owner.
 - 3. The work site restoration work shall be completed in accordance with the requirements of the applicable Site Restoration sections of these Specifications.
- B. All excess material and debris not incorporated into the permanent installation shall be disposed of by the Contractor.
 - 1. The debris and liquids are to be disposed of properly in accordance with all applicable laws.
 - a. The Owner 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.

3.03 DOCUMENTATION

- A. The Contractor shall complete work on each asset as assigned via the County's Computerized Work Order Management system.
 1. Upon start of work, the Contractor shall receive work orders as assigned by the Program Manager.
 2. The Contractor shall maintain and synchronize the status of each rehabilitation work order issued.

3.04 WARRANTY

- A. The Contractor shall guarantee the work for a warranty period of one (1) year from the date of final acceptance.
 1. If, at any time during the warranty period, any defect is identified the Contractor shall make repairs acceptable and at no additional cost to the Owner.
 - a. 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 02609
MANHOLE FRAME AND COVER SEALING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This section covers the materials and methods for sealing leaking manhole frames for sanitary sewers.

1.02 SCOPE

- A. Frame Sealing includes:
 - 1. Sealing the frame joint area and the chimney above the cone of the manhole with either a manufactured or applied internal or external flexible seal.
 - 2. Design seal to prevent leakage of water into the manhole through these areas throughout a minimum 50-year design life.
 - 3. Installed seal shall remain flexible,
 - a. Allow for repeated vertical movements of the frame due to frost lift, ground movement, or other causes of not less than 2 inches
 - b. Repeated horizontal movement of the frame due to thermal movement of pavement or other causes of not less than ½ inch throughout the design life.
- B. Manhole Cover Sealing includes:
 - 1. Either the replacing or sealing existing manhole covers.
 - 2. Methods described require at a minimum, the thorough cleaning of the frame rim surface by wire brushing. More aggressive cleaning methods shall be employed if either the existing conditions or the existing castings require other actions.
 - 3. Detailed installation procedures shall be in accordance with the manufacturer's instructions.

1.03 REFERENCES

- A. American Society of Testing Materials International (ASTM):
 - 1. A240/A240M - 13a Standard Specification for Chromium and Chromium- Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - 2. C923 - Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes and Laterals.
 - 3. D412-06a - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.

4. D476 - Standard Classification for Dry Pigmentary Titanium Dioxide Products.
5. D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds.D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.
6. F594- Standard Specification for Stainless Steel Nuts.

1.04 SUBMITTALS

- A. Submittals shall conform with Section 01300 Submittals of these specifications.
- B. Action Submittals:
 1. Manufacturer's Certificate of Compliance certifying compliance with applicable specifications and standards and that the submitted product is appropriate for the service intended.
 - a. Certified copies of test reports of factory tests required by the applicable standards and this Section.
 - b. Manufacturer's installation instructions and procedures and insertion runs.
 2. Procedures and materials for manhole frame sealing. Product data to include:
 - a. Material handling and storage,
 - b. Material properties,
 - c. Mixing and proportioning requirements,
 - d. Maximum pot life,
 - e. Film/coating thickness,
 - f. Certification of all rehabilitation materials.
 - g. Recommended testing
 3. Plan for capturing extraneous debris during rehabilitation process and debris disposal.
 4. Safety Data Sheets (SDS).
 5. Applicator's Certification Qualifications/referenced projects.
 6. Approval of applicators equipment to be used for applying the product
 7. Safety Plan; Confined Space Entry Plan/Permit.
 - a. Confined space training documentation for affected personnel
 8. Field Test Report.
 9. Construction Photographs.
 10. Complete a daily written record (diary) as required in Section 01320 Progress Reports, Videos and Photographs.
 11. Confined Space Entry Plan

- a. Personnel certificates of training for confined space entry

1.05 APPLICATOR'S QUALIFICATIONS

A. Applicator's Qualifications

1. Minimum 5 years' experience in application of products to be used.
 - a. Applicator has been trained and approved in the handling, mixing and application of the products to be used.
 - b. Equipment to be used for applying the product has been approved and the applicator personnel have been trained and certified for proper use of equipment.
 - c. Five (5) recent references of applicator (projects of similar size and scope) indicating successful application within the past 10 years.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Responsible for delivery, storage, and handling of products.

1. Store, handle products in accordance with manufacturer's written recommendations.
2. In accordance with Federal, State and Local laws and regulations.

B. Protect products from damage.

1. Damaged products shall be removed from the Site of the Work promptly.
2. Damaged products shall be replaced with undamaged products at no additional cost to the contract.

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

A. Reference Specification Section 01030, Special Project Procedures, Section 3.01

1.08 SAFETY

- A. All work shall be performed in accordance with OSHA standards and Federal, State, and local safety regulations.
- B. No person shall enter a confined space without the documented requisite training, certification, entry permit and confined space entry plan.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Products proposed for manhole frame sealing shall be approved during the submittal process prior to use on the project.
- B. Obtain approval and a hydrant water meter from the DeKalb County Department of Watershed Management before operating fire hydrants.

2.02 FLEXIBLE INTERNAL RUBBER SLEEVE

- A. Extensions and wedge strips shall be extruded or molded from a high grade rubber compound conforming to the applicable requirements of ASTM C923,
 - 1. Minimum of 1500 psi tensile strength,
 - 2. Maximum eighteen (18) percent compression set Hardness (durometer) of forty-eight (48) \pm 5.
- B. Either double or triple pleated with a minimum unexpanded vertical height of eight
- C. (8) inches and ten (10) inches respectively
 - 1. Minimum thickness of 3/16 inch.
 - 2. Top and bottom section of the flexible rubber sleeve shall contain an integrally formed expansion band recess and multiple sealing fins.
- D. Top section of the extension shall have a minimum thickness of 3/32 inch and shall be shaped to fit into the bottom band recess of the flexible rubber sleeve under the bottom chimney seal band and the remainder of the extension shall have a minimum thickness of 3/16 inch.
 - 1. The bottom section of the extension shall contain an integrally formed expansion band recess and multiple sealing fins matching that of the flexible rubber sleeve.
 - 2. Any splice used to fabricate the flexible rubber sleeve and extension shall be hot vulcanized and have a strength so the sleeve can withstand a 180 degree bend with no visible separation.
 - 3. The continuous wedge strip used to adapt the flexible rubber sleeve to sloping surfaces shall have the slope differential needed to provide a vertical band recess surface, be shaped to fit into the band recess, and have an integral band restraint.
 - a. The length of the wedge strip, when its ends are butted together, will cover the entire inside circumference of the band recess needing slope adjustment.
 - 4. Expansion bands, studs, and nuts used to compress the sleeve against the manhole shall be integrally formed from sixteen (16) gauge stainless steel conforming to the requirements of ASTM A240, Type 304, with no welded attachments
 - a. Minimum width of 1 $\frac{3}{4}$ inches.
 - b. Minimum adjustment range of two and one half (2 1/2) diameter inches.
 - c. Positive locking mechanism used to expand the band shall have the capacity to develop the pressures necessary to make a watertight seal.
 - d. Band shall be permanently held in place with a positive locking mechanism which secures the band in its expanded position after tightening.
- E. Flexible rubber sleeve manhole frame seal shall be manufactured by:

1. Cretex Specialty Products,
2. Sealing Systems Inc.
3. or submitted and approved “or equal” product.
 - a. Products substituted for use must follow the requirements found in the DeKalb County General Requirements.
 - b. It is the Contractor’s responsibility to timely submit information/tests for the Program Manager to make the determination of “or equal” status.

2.03 FLEXIBLE URETHANE RESIN

- A. Manhole frame seal shall be used to form a flexible seal to stop inflow/infiltration and provide corrosion protection to the internal wall of a manhole from three (3) inches above the bottom of the frame to three (3) inches below the top of the cone.
 1. The finished product shall conform to the minimum requirements listed below:

	Prime Coat		Final Coat	
<i>Hardness</i>	ASTM-D 2240	85-90	ASTM-D 2240	75
<i>Elongation</i>	ASTM-D 412	400%	ASTM-D 412	800%
<i>Tensile Strength</i>	ASTM-D 412	3200 psi	ASTM-D 412	1150 psi
<i>Adhesive Strength</i>	ASTM-D 903	400 lb l/in	ASTM-D 903	175 lb l/in
<i>Tear Resistance</i>	ASTM-D 1004	210 lb l/in	ASTM-D 1004	155 lb l/in

- B. Flexible urethane resin manhole frame seal shall be Flex Seal Utility Sealant as manufacturer by Sealing Systems, Inc. or approved equal.

2.04 COVER CONVERSION AND REPLACEMENT

- A. Replace frame and cover as directed by Program Manager in writing on a per-manhole basis.
- B. Reuse the existing cover by making it watertight.
 1. Accomplish by installing a gasket between the cover and the cover-bearing surface of the frame
 2. Plug the vent and pick holes.
 3. Make one of the plugs removable to facilitate removal of the cover.
- C. Manhole cover gaskets and plugs shall be as specified in Section 02608.

2.05 MANHOLE INSERT

- A. The manhole insert shall be manufactured from stainless steel, Type 304, 16- gauge minimum.

1. Insert shall have
 - a. Factory installed handle that is a minimum of 5-feet long, 3/16-inch plastic coated stainless steel cable retaining tether that passes through a watertight grommet in the bottom of the dish
 - b. High-grade stainless steel adjustable locking device located between bottom of the dish and lift loop at the top end of tether.
 - c. Stainless steel terminal and eye and the handle shall be attached with a No. 6 high-grade stainless steel rivet.
- B. Gasket shall be made of a closed-cell neoprene with pressure sensitive adhesive on one side and shall be installed by the manufacturer.
- C. Insert shall have a gas relief valve designed to release at a pressure of 0.5 to 1.5 psi.
 1. Material shall be Nitrile for prevention of corrosion from contact with hydrogen sulfide, diluted sulfuric acid, and other gases associated with wastewater collection systems.

PART 3 – EXECUTION

3.01 GENERAL

- A. Perform all installation in accordance with the manufacturer's recommendations and in accordance with the requirements of Federal, State, and local laws and regulations.
- B. Perform all tests in accordance with OSHA, Federal, State and local safety regulations prior to initiating entry in to confined space.
- C. Entry into Confined Space shall only by undertaken in compliance with submitted Confined Space Entry Plan.
- D. Active leaks must be corrected before the installation of any approved product.
- E. Provide traffic control in accordance with the requirements of applicable State and local Georgia Department of Transportation (GDOT) requirements.
- F. Manhole frames misaligned from the chimney or cone by three (3) inches or more shall be excavated and realigned.
 1. Existing frames shall be thoroughly cleaned before reinstallation.
 2. Realignment work shall be performed in accordance with Section 02900, Sanitary Sewer Manhole Rehabilitation.
- G. Loose and protruding mortar and brick interfering with the seal's performance shall be removed
 1. Clean appropriate areas of the manhole frame, chimney, and/or cone/corbel by wire brushing or by more aggressive means if required by the manufacturer. The most stringent shall apply.
 2. Sealing surfaces shall be reasonably smooth and circular, clean, and free of any loose material or excessive voids.

3.02 FLEXIBLE INTERNAL RUBBER SLEEVE

- A. The Contractor shall be properly trained, certified, and licensed in the installation of frame seals by the manufacturer. Have a manufacturer's recommended expansion tool and all other equipment/tools necessary to install the frame seals.
- B. Field measure the manhole to determine the information required on the manufacturer's "Sizing and Ordering" procedure.
- C. Contact surface for the sleeve and/or extensions shall be reasonably clean and smooth, circular and free from excessive voids or defects.
- D. Detailed surface preparation, including providing a vertical surface on a cone when none exists, shall be in accordance with the frame seal manufacturer's instructions.
- E. The Contractor shall install the flexible rubber sleeve in accordance with the manufacturer's instructions.
- F. After any surface preparation is completed and the rubber sleeve has been placed in the proper position, the lower band is positioned in the band recess and expanded as required to provide a water tight seal.
- G. Following the expansion of the lower band:
 - 1. Perform a QA/QC test to ensure effective sealing by pulling the upper section of the seal or extension inward to create a recess behind the seal where water can be poured.
 - 2. Pour the water behind the seal and observe the lower sealing area for any visible leaks.
 - 3. Consider the seal effective if no water leaks behind the seal at the lower sealing area.
 - 4. Owner's Representative shall witness test
- H. If an extension is used;
 - 1. Place the 3/32" thick extension flap into or behind the expansion band recess to allow for the compression of both the extension flap and sleeve against the manhole surface by the expansion band.
 - 2. Continue by placing the upper band or bands in the recess, ensuring the seal is properly placed on the manhole cone, chimney and frame and expand as required to provide an effective seal.
 - 3. Installation procedures shall be in accordance with the manufacturer's recommended instructions.

3.03 FLEXIBLE URETHANE RESIN

- A. Detailed surface preparation shall be in accordance with the frame seal manufacturer's instructions.
- B. The Contractor shall install the flexible rubber sleeve in accordance with the manufacturer's instructions.

3.04 INSTALLATION OF MANHOLE INSERT

- A. Use the existing cover in conjunction with a watertight insert installed under the cover that prevents entry of water into the manhole.
- B. Manhole insert shall be designed to prevent inflow through and around manhole covers and manufactured to fit the manhole frame rim upon which the manhole cover rests.
- C. Installation shall be in accordance with the insert manufacturer's instructions.
- D. The manhole insert shall be fully seated upon the manhole frame rim and the cover replaced to complete the installation.

3.05 INSPECTION

- A. Manhole frame seals shall be visually inspected after installation to ensure the seal is properly installed,
 - 1. No voids or leakage points shall exist,
 - 2. Manhole frame seal shall not detach from the manhole.
 - 3. Any seals failing this visual test shall be reworked, as necessary, and retested at the Contractor's own expense.

3.06 TESTING

- A. Any seals not passing this visual inspection may, at the Contractor expense, be tested for leakage using a method approved by the Program Manager. Program Manager shall witness test.
- B. Frame Sealing Test:
 - 1. 1. Manufactured frame seals shall be visually inspected to ensure
 - a. Sleeve is properly positioned,
 - b. Tight against the manhole surfaces,
 - c. No voids or leakage points exist under the sleeve,
 - d. Bands and locking nuts are tight.
 - 2. Applied seals shall be visually inspected to ensure they have been applied according to the manufacturer's instructions.
 - 3. Manhole frame sealing shall be randomly tested for leakage using a method approved by the Program Manager.
 - a. A minimum of 10 percent of the sealed manholes shall be tested.
 - b. Failing manholes shall be reworked and retested by the Contractor at no additional compensation.
 - c. If more than 5 percent of the manholes tested fail the initial test, an additional 10 percent of the sealed manholes shall be tested.
 - d. This process will continue until the testing is satisfactory, or until all manholes have been tested.

- C. Cover Sealing Test:
1. The sealed manhole covers shall be visually inspected to ensure the bearing surface was properly cleaned, products were properly sized, installed according to the manufacturer's instructions.
 2. Manholes leaking, visually unacceptable, or failing the test shall be reworked and retested.
 - a. Contractor shall be reimbursed for the cost of this additional work if an inspection by the Contractor and the Program Manager shows the work performed by the Contractor was not the reason for the failure of the manhole to pass the leakage test.
 - b. The Program Manager reserves the right to inspect the sealed manholes during the warranty period.
- 1) Any leakage or defects in the work found by this inspection shall be corrected by the Contractor within an agreed-upon time at no additional cost to the Owner.

3.07 CLEANUP

- A. After the work has been completed and all testing acceptable, the Contractor shall clean up the work area.
1. Leave the work area 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 02776, Site Restoration and Erosion Control.
- B. All debris and excess material not incorporated into the permanent installation shall be disposed of by the Contractor.
1. Debris and liquids are to be disposed of properly in accordance with all applicable laws.
 2. Local municipality can furnish a letter to the landfill stating the Contractor is authorized to dispose of the non-hazardous materials.
 3. Debris and liquids type and quantities are to be tracked in the daily contractor diary.
 4. Hauling and disposal costs will be borne by the Contractor.

3.08 WARRANTY

- A. The Contractor shall guarantee the work for a warranty period of one (1) year from the date of final acceptance.
1. If at any time during the warranty period, any defect is identified the Contractor shall make repairs acceptable to the Owner's Representative and at no additional cost to the Owner.

- a. 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 02622
PVC GRAVITY SEWER PIPE

PART 1 – GENERAL

1.01 SECTION INCLUDES

This section includes requirements to furnish, install, make the joints, and test PVC gravity sewer pipe and appurtenances as shown on the drawings and as required by these Specifications.

1.02 RELATED SECTIONS

- A. Section 02324: Trenching and Trench Backfilling
- B. Section 02608: Manhole Frame and Cover Installation
- C. Section 02641: Precast Concrete Manholes
- D. Section 02650: Testing for Acceptance of Sanitary Sewers

1.03 REFERENCES

- A. ASTM D 2241 – Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure- Rated Pipe (SDR Series)
- B. ASTM D 2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
- C. ASTM D 3034 – Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe Fittings
- D. ASTM F 679 - Standard Specification for Poly(Vinyl Chloride) (PVC) Large- Diameter Plastic Gravity Sewer Pipe and Fittings

1.04 SUBMITTALS

- A. Submit for review completely detailed working drawings and schedules of all PVC pipe and fittings required.
- B. Submit all product data
- C. Submit for review the proposed exfiltration and/or infiltration testing method.

PART 2 - PRODUCTS

2.01 PVC GRAVITY SEWER PIPE

- A. PVC pipe and fittings shall be solid wall PVC gravity sewer pipe conforming to ASTM D 3034, for Type PSM PVC, (SDR 26) in sizes 4-inch through 15-inch and ASTM F679 for Type PS46 PVC for 18-inch and larger. All pipe shall be thoroughly inspected by the contractor and the Program Manager upon delivery, and any pipe not conforming to the above requirements will be rejected and shall be

removed immediately from the Work Site by the Contractor. The Program Manager will apply all standard tests of the pipe necessary to assure conformity with the specifications. All such tests shall be made in accordance with the methods prescribed by, and the acceptance or rejection of PVC pipe shall be based upon the ASTM Standard Specifications referred to above.

- B. Standard pipe lengths not greater than thirteen (13) feet shall be used on the Work.
- C. Pipe out of round, or otherwise defective will be rejected even though it meets the strength requirements of the specifications. Rejected pipe shall be removed from the site at once.
- D. Attention is called to the proper method of stacking integral bell gasketed joint pipe. To avoid stress in the bell end of the pipe due to a pipe resting thereon, the pipes shall be stacked with bell ends projecting from the stack in opposite directions for alternate rows. The bottom row of pipe shall be supported free of the ground.
- E. Limitations:
 - PVC pipe is not allowed under roadways
 - beyond the edge of pavement, SDR 26 PVC is acceptable in or out of the R/W for mainline and laterals at depths up to 15 feet.

2.02 PVC FITTINGS

- A. PVC gravity sewer fittings shall meet the requirements of ASTM D 3034 Type PSM Poly (Vinyl-Chloride) (PVC) Sewer Pipe and Fittings for sizes 4-inch through 15- inch, and ASTM F679 Poly (Vinyl-Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings in sizes 18-inch and larger.
- B. All pipe and fittings shall have integral bell gasketed joints especially engineered for gravity sewer mains and laterals. Rubber gaskets conforming to ASTM F477 shall be factory installed in a precision formed recessed groove.
- C. Laying instructions of the manufacturer of the pipe and joint shall be followed explicitly. Examine each bell and spigot end to determine whether the preformed joint has been damaged prior to installation. Any pipe having defective joint surfaces shall be rejected.

PART 3 - EXECUTION

3.01 LAYING PVC PIPE

- A. Gravity sewer lines shall be laid according to the details shown on the drawing or specified herein, and according to the applicable portions of ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
- B. The trench bottom shall be graded to the proposed elevation of the pipeline and the bottom shaped to fit the lower quadrant of the pipe. Holes shall be excavated at each bell so the pipe is supported along the barrel only. Pipe bedding shall be described in Section 02324 – Trenching and Trench Backfilling.

- C. Pipe shall be protected during handling against impact shocks and free fall. Pipe laying shall not precede backfilling by more than 100 feet unless limited further by the Program Manager.
- D. Laying pipe in finished trenches shall be commenced at the lowest point, with the spigot ends pointing in the direction of flow. The interior of the pipe and the jointing seal shall be free from sand, dirt, and trash before installing in the line. Extreme care must be taken to keep the bells of the pipe free from dirt and rocks so joints may be properly assembled without overstressing the bells. Pipe jointing shall be done in strict accordance with the pipe manufacturer's instructions and shall be done entirely in the trench.
- E. PVC pipe shall have tracer wire to be traced by electronic means. This can be achieved by placing twelve- (12-) gauge wire over the pipe in the trench and connecting it to the manhole frame. The tracer wire shall terminate at the cleanout, located in the right-of-way.
- F. Each time the work on the sewer is halted for more than one (1) hour, the ends of the pipe shall be sealed by means of a commercially manufactured plug to prevent foreign material from entering the pipe.

3.02 Y-BRANCHES

- A. PVC Y-branches shall be manufactured with watertight preformed joints suitable for use with PVC gravity sewer pipe. Each Y-branch shall be provided with a PVC plug. The Y-branches shall be installed as detailed on the plans at locations indicated by the Program Manager in the field.
- B. The manhole drops, where indicated on the plans, shall be constructed of ductile iron pipe and fittings as detailed on the plans and encased in concrete.
- C. Stubs for future pipe connections shall be installed from the main to the property line (right-of-way) at locations as shown on the drawings. Stubs shall be PVC gravity sewer pipe with a PVC plug.

3.03 TESTING AND CLEANING

- A. See Section 02650 – Testing for Acceptance of Sanitary Sewers
- B. Cleaning
 - 1. At the conclusion of the work the Contractor shall thoroughly clean all of the pipe by flushing with water or other means to remove all dirt, stones, pieces of wood, or other material entering during the construction period. Debris cleaned from the lines shall be captured and removed from the lowest outlet. If, after this outlet cleaning, obstructions remain, they shall be removed. After the pipe is cleaned and if the groundwater level is above the pipe, or following a heavy rain, the Program Manager will examine the pipe for leaks. If defective pipes or joints are discovered at this time, they shall be repaired by the Contractor.

END OF SECTION

SECTION 02641
PRECAST CONCRETE MANHOLES

PART 1 - GENERAL

1.01 SECTION INCLUDES

The work covered by this section includes furnishing all labor, equipment, and materials required to install precast concrete manholes complete with frames and covers as described herein and as shown on the Plans.

1.02 RELATED SECTIONS

- A. Section 01030: Special Project Procedures
- B. Section 02205: Dewatering
- C. Section 02324: Trenching and Trench Backfilling
- D. Section 02276: Site Restoration and Erosion Control
- E. Section 02607: Manhole Height Adjustment
- F. Section 03300: Cast-In-Place Concrete

1.03 REFERENCES

- A. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
- B. ASTM C443 - Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe using Rubber Gaskets.
- C. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
- D. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.
- E. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (non-shrink).

1.04 SUBMITTALS

- A. Submittals shall conform to the requirements of the General Conditions of the Contract and the Submittals section of these Specifications.
- B. The Contractor shall submit manufacturer's data and details of the following items for approval:
 - 1. Shop drawings of manhole sections and base units and construction details, including reinforcement, jointing methods, and materials.
 - 2. Summary of criteria used in the manhole design including, as a minimum, material properties, loadings, load combinations, and dimensions assumed.
 - 3. Materials to be used in fabricating drop connections.

4. Materials to be used for pipe connections at manhole walls.
 5. Materials to be used for stubs and stub plugs, if required.
 6. Materials and procedures for corrosion resistant liner and coatings, if required.
 7. Plugs to be used for vacuum testing.
 8. Manufacturer's data for pre-mix (bag) concrete, if used for channel inverts and benches.
 9. Description of the proposed method of concrete curing.
- C. The Contractor shall complete a daily written record (diary) as required per section 01320 – Progress Reports & Videos

1.05 DESIGN CRITERIA

- A. Manholes shall be constructed of specified materials to the sizes, shapes, and dimensions and at the locations shown on the Plans or as otherwise directed by the Program Manager. The height or depth of the manhole will vary with the locations, but, unless shown otherwise on the Plans, the top of the manhole frame will be at the finished grade of the pavement or higher than the ground surface as shown on the Plans and the invert will be at the designed elevations.
- B. Manholes in wooded or unmaintained easements areas shall be a minimum of twenty-four (24) inches above ground level and a minimum of two (2) feet above the one hundred (100) year flood plain; whichever is greater.
- C. Flood Plain Areas: Manholes located within the one hundred (100) year flood plain shall contain manhole frames bolted to the eccentric cone in order to stabilize the manhole adjustment rings.
 1. The manhole adjustment rings shall contain pre-drilled holes for the bolts from the pre-cast manufacturer.
 2. Manhole concrete rings shall be secured to each other to protect against slide and tilt of rings due to buoyancy.

1.06 QUALITY ASSURANCE

- A. Prior to delivery, all basic materials specified in this section shall be tested and inspected by an approved independent commercial testing laboratory or, if approved by the Program Manager, certified copies of test reports prepared by the manufacturer's testing laboratory will be acceptable. All materials failing to conform to these Specifications shall be rejected.
- B. After delivery to the Work Site, any materials damaged in transit or are otherwise unsuitable for use in the Work shall be rejected and removed from the Work Site.

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

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

1.08 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 PRECAST CONCRETE MANHOLES

- A. Unless specified otherwise in the Plans or in the Special Conditions of the Contract, all manholes will be precast concrete manholes as specified in this section.
- B. The precast reinforced concrete manholes shall be constructed in accordance with the requirements of ASTM C478. Reinforced concrete manholes shall consist of manhole base sections, riser sections, transition sections, and conical sections as described in this section. The manhole components shall be configured to minimize the number of joints required per manhole (see Detail Drawings). The Program Manager may require any manhole not composed of the minimum number of sections to be replaced.
- C. Portland cement concrete used in the precast reinforced concrete manholes shall have a minimum compressive strength of 4,000 psi at twenty-eight (28) days.
 - 1. The concrete shall contain type II Portland cement with a C3A content of five and one-half (5½) percent or less and meet the requirements of ASTM C478.
 - 2. Limestone aggregate for concrete, except for maximum size and gradation, shall be as specified in applicable sections of these Specifications.
 - 3. To aid in achieving the specified concrete compressive strength, newly cast manholes shall be cured in accordance with the requirements of ASTM C478. The method of curing proposed must be submitted to the Program Manager prior to manufacture. Manholes shall be cured for a minimum of seven (7) days prior to shipment to the Work Site unless otherwise instructed by the Program Manager.
 - 4. The manhole manufacturer shall test the compressive strength of a minimum of two (2) concrete cylinders per calendar week. Reports verifying the results of the compression tests shall be maintained at the manufacturer's facility. Reports shall be made available for inspection and review by Program Manager. The manhole manufacturer shall permit the Program Manager to make unannounced reviews of compression test records and inspection of manufacturing facilities at any time during normal business hours.
 - 5. The manhole manufacturer shall notify the Program Manager of all manholes delivered for use in the County's Wastewater Collection and Transmission System (WCTS) were manufactured during a week when a concrete compressive strength test yielded a result of less than 4,000 psi.
 - a. Such notification shall be in the form of a letter sent to:

DeKalb County Department of Watershed Management
Engineering and Technical Services
1580 Roadhaven Dr.
Stone Mountain, Georgia 30083

Attention: Director

- b. Notification shall include, at a minimum, the project name, Contractor name, date of manhole component manufacture, and description of manhole component(s) affected.
 - c. The Program Manager may require additional testing, repairs, or removal and replacement, at no additional cost to the County, of any or all manhole components provided for use in the County's WCTS and were manufactured during a calendar week when a concrete compressive strength test yields a result of less than 4,000 psi.
 - d. Documentation to also be submitted digitally in PDF format to Program Manager.
- D. Reinforcing steel shall be bars of intermediate grade, open hearth, billet steel, conforming to the requirements of ASTM A615, or Cold-Drawn Steel Wire for Concrete Reinforcement conforming to the requirements of ASTM A82; or of wire fabric conforming to the requirements of ASTM A185. The circumferential reinforcement in the riser and conical top sections shall have an area of not less than 0.12 square inches per linear foot.
- E. The interior and exterior surfaces of the manhole shall have a smooth hard finish, and shall be free from cracks, chips, and spalls.
- F. The maximum allowable absorption of the concrete used for manhole construction shall not exceed eight (8) percent of the dry weight.
- G. Manhole base sections shall be circular, wet cast, and may be supplied in forty-eight (48) inches, sixty (60) inches, seventy-two (72), and ninety-six (96) inches diameters. Heights shall range from forty-eight (48) inches to ninety-six (96) inches depending on availability with diameter and as specified or approved by the Program Manager. All base sections shall be supplied with Manhole Lift System inserts. Lifting eye bolts shall be supplied to the Contractor upon request. Pipe openings shall be furnished in accordance with Section 3.3.B.
- H. Riser sections shall be circular, wet or dry cast, and may be supplied in forty-eight (48) inches, sixty (60) inches, and seventy-two (72) inches diameters. Heights shall range from sixteen (16) inches to forty-eight (48) inches in sixteen (16) inch multiples depending on availability with diameter and as specified or approved by the Program Manager. All riser sections shall be supplied with Manhole Lift System inserts. Lifting eye bolts shall be supplied to the Contractor upon request.
- I. Transition sections shall be wet or dry cast. Conical transition sections shall be supplied for sixty (60) inches to forty-eight (48) inches diameter transitions. Conical transitions shall be thirty-two (32) inches high. Sixteen (16) inches high conical transitions may only be used when approved by the County's Representative. All conical transition sections shall be supplied with a Manhole Lift. Flat slab transitions shall be supplied for base sections seventy-two (72) inches to ninety-six (96) inches in diameter. Flat slab transitions shall be manufactured structurally to meet individual project requirements. Clear access openings shall be provided to accommodate riser sections as shown in the Plans or as detailed in the Detail Drawings.
- J. Conical sections shall be wet or dry cast, concentric only. Eccentric sections will not be allowed. Conical sections shall transition from forty-eight (48) inches diameter to

a twenty-seven (27) inches clear access opening and be either twenty-four (24) inches, thirty-six (36) inches, or forty-six (46) inches high. They shall be supplied with a Manhole Lift.

- K. Precast manhole riser joints shall be offset tongue and groove type, supplied with Tylox Super Seal pre-lubricated gasket. Each joint shall also be supplied with Conseal CS-231 waterstop sealant as manufactured by Concrete Sealants, in widths as recommended by the manufacturer. All joints shall be permanently strapped utilizing three (3) bitumastic coated steel strap anchors located one-hundred and twenty (120) degrees apart.
- L. The ends of each reinforced concrete manhole riser section and the bottom end of the manhole top section shall be so formed so when the manhole risers and the top are assembled, they will make a continuous uniform manhole.
- M. Standard manholes of precast concrete construction, and other manholes of precast concrete construction having entering sewers of twenty-four (24) inches diameter or smaller shall have precast openings in the manhole walls for incoming or outgoing sewers as indicated on the Plans.
- N. All components of a manhole for a particular location shall be clearly marked in order the manhole may be correctly assembled to suit construction conditions existing at that particular location.
- O. All precast concrete manhole base sections and drop manhole bases shall be set on a foundation of #57 compacted stone aggregate, twelve (12) inch minimum thickness, and covering the entire bottom of the excavation for the manhole. Aggregate size may be adjusted by the Program Manager based on field conditions.
- P. Manhole riser rings and/or brick and mortar used to adjust manhole frame to grade, shall conform to Section 02607 - Manhole Height Adjustment.
- Q. Manhole steps shall conform to the requirements of this section.

2.02 STRUCTURAL MATERIALS AND CASTINGS

- A. Structural steel shall conform to the requirements of ASTM A283, unless otherwise indicated on the Plans.
- B. Steel castings shall conform to the requirements of ASTM A27. The grades to be used will be specified in the Special Conditions of the Contract or indicated on the Plans.
- C. Gray iron castings shall conform to the requirements of ASTM A48. All castings shall be clean and free of scale, adhesions, or inclusions. Gray iron castings for manhole or inlet frames and covers or gratings shall be cast from Class 30B cast iron. Bearing surfaces between manholes, inlet frames, and covers or gratings shall be such that the cover or grating shall seat in any position onto the frame without rocking. Bearing surfaces for standard manhole frames and covers shall be machined.
- D. Aluminum castings shall conform to the requirements of ASTM B108.
- E. Structural aluminum shall conform to the requirements of either ASTM B209, B221, B308, B241, or B211, as applicable. Finished bolts and nuts shall be given an anodic coating of at least 0.0002 inches in thickness.

2.03 FRAMES, COVERS, AND STEPS

- A. New manhole rims, toe pockets, frames, and covers shall be cast iron conforming to the requirements of ASTM A48 for Class 30 Gray Iron Castings. All castings shall be made accurately to the required dimensions, fully interchangeable, sound, smooth, clean, and free from blisters or other defects. Defective castings which have been plugged or otherwise treated shall not be used. All castings shall be thoroughly cleaned and painted or coated with bituminous paint. Each casting shall have its actual weight in pounds stenciled or painted on it in white paint.
- B. Manhole frames and covers shall be as detailed on the Plans, and as manufactured by Vulcan Foundry, or as manufactured by the Griffin Foundry Co., Russell pipe & Foundry Co., or equal.
- C. Sanitary sewer manhole covers shall have the words "DeKalb County Sanitary Sewer" cast on the top in letters two (2) inches high.
- D. Where manhole rim elevation is required to be two (2) feet above the ground surface, covers shall be hinged to prevent damage and/or injury.
- E. Manhole inlet steps shall be made of steel reinforced copolymer polypropylene model PS-1 PF. They shall be installed at maximum sixteen (16) inch intervals. Manhole steps shall be as shown in the Detail Drawings with rod and pull ratings meeting OSHA standards.

2.04 SPECIALTY ITEMS

- A. One piece manholes shall be manufactured in accordance with the requirements of ASTM C478 and as detailed in the Detail Drawings. They shall be cast utilizing 4,000 psi concrete containing type II cement with a C3A content of five and one-half (5½) percent or less. They shall be manufactured within a minimum eight (8) inches thick base with dowel steel reinforcement and waterstop. They shall be used only in situations which will not accommodate a twenty-four (24) inch base section and twenty-four (24) inch conical section.
- B. 36" x 48" Manhole Tees shall be manufactured in accordance with the requirements of ASTM C478 and as detailed in the Detail Drawings. They shall be cast utilizing 4,000 psi concrete containing type II cement with a C3A content of five and one-half (5½) percent or less.
- C. Saddle manholes shall be manufactured in accordance with the requirements of ASTM C478 and as shown in the Detail Drawings. They shall be cast utilizing 4,000 psi concrete containing type II cement with a C3A content of five and one-half (5½) percent or less.
- D. Drop Manholes (Memphis Tees) shall be manufactured in accordance with the requirements of ASTM C478 and as detailed in the Detail Drawings. They shall be cast utilizing 4,000 psi concrete containing type II cement with a C3A content of five and one-half (5½) percent or less.
- E. For manholes in corrosive environments that will require special protection, comply with the requirements of Section 03462 – Polymer Concrete Manholes.

PART 3 - EXECUTION

3.01 GENERAL

- A. All activities shall be performed in accordance with the manufacturer's recommendations and regulations established by OSHA. Particular attention shall be drawn to those safety requirements involving working with scaffolding and entering confined spaces.
- B. The Contractor shall verify the lines and grades are as specified in the Plans.

3.02 INSTALLATION

- A. Manholes shall be constructed to the sizes, shapes, and dimensions as detailed in the Detail Drawings and at the locations shown on the Plans. They shall be constructed of precast concrete sections conforming to the requirements of this section. The manholes shall be assembled with the fewest number of sections to make up required height, thereby reducing the number of joints. The composition of the manhole must be approved by the Program Manager. The Program Manager may require any manhole not composed of the minimum number of sections to be replaced. The depth of the manhole will vary with the location but, in all cases, it shall be such as will place the cover (or lid) at the finished grade of the pavement or ground surface or as otherwise indicate on the Plans. In undeveloped or rural areas, manholes shall be furnished to a height of two (2) feet above ground. The invert shall be placed at the elevation shown on the Plans. Eccentric cone sections and flat top manholes, except for shallow depth where approved by Program Manager, will not be allowed; only concentric cones will be used.
- B. Precast concrete manholes for reinforced concrete sewers forty-eight (48) inches diameter and larger shall be as specified above, except that they shall be installed on a saddle constructed on the barrel of the sewer. Precast concrete manholes for sewers thirty (30), thirty-six (36), and forty-two (42) inches shall be saddle-types or precast base types as specified in the Plans. Reinforcing steel in the saddle shall be welded to the reinforcing steel of the pipe. The design of these saddles shall be approved by the Program Manager prior to manufacture.
- C. All joints for precast manhole stacks shall be offset tongue and groove with Tylox Super Seal pre-lubricated gaskets as manufactured by Hamilton Kent. Each joint shall also be sealed with Conseal CS-231 waterstop sealant as manufactured by Concrete Sealants. The width and installation of the joint sealant shall be in accordance with the manufacturer's recommendations. All joints shall be supplied with 3" x 16" x 1/2" inch bitumastic coated steel strap anchors. Three (3) strap anchors, one-hundred and twenty (120) degrees apart shall be required per joint.
- D. Where the difference in the invert elevation of two (2) or more sewers, eighteen (18) inches in diameter or smaller, intersecting in one (1) manhole is two (2) feet or more, a Drop Manhole (Memphis Tee) shall be constructed in the manner shown in the Detail Drawings. They shall be similar in construction to the standard manhole, except that a drop connection of a pipe and fittings of the proper size and material shall be constructed outside the manhole and supported by Class B concrete as indicated on the Plans and in the Detail Drawings. The manhole and the drop connection shall be placed on twelve (12) inch reinforced concrete base as detailed in the Detail Drawings. The drop connection piping assembly shall be bolted to the

barrel of the manhole riser using a minimum of four 5/8-inch diameter stainless steel (316) bolts with suitable washers to prevent failure caused by pulling the bolt head through the manhole wall.

- E. Base sections shall be precast with the vertical walls of sufficient height to allow entry of the required pipes as shown on the Plans, and as detailed in the Detail Drawings. Manhole inverts shall be constructed of cement mortar and shall have the same cross-section as the invert of the sewers which they connect. The manhole invert shall be carefully formed to the required size and grade by gradual and even changes in sections. Changes in direction of flow through the sewer shall be made to a true curve with as large a radius as the size of the manhole will permit.
- F. All water standing in the trench shall be removed before placing of concrete is started, and the foundation maintained in a dry condition.
- G. Shallow manholes shall be constructed to the sizes, shapes, and dimensions as detailed in the Detail Drawings, and at the locations shown on the Plans. They shall be constructed of precast concrete sections as shown on the Plan or as directed by the County's Engineer.
- H. The top elevation of manhole frames shall be adjusted to grade in areas such as streets, alleys, and parking lots or where indicated on the Plans. A maximum adjustment of twelve (12) inches will be allowed using brick and mortar. Adjustments greater than twelve (12) inches must be made by changing precast riser sections. Brick used will be in accordance with the requirements of this section.

3.03 PIPE CONNECTIONS AT MANHOLES

- A. Openings in manhole walls for incoming and outgoing sewers shall be precast or cored and after installation sealed with an approved non-shrink grout. These manholes shall be installed on choked and compacted stone bedding as detailed in the Detail Drawings.
- B. A flexible manhole connector may be approved by the Program Manager as an alternate method of sealing the space between the manhole wall and the pipe. Flexible manhole sleeves shall be required for all pipes eighteen (18) inches and smaller and shall be cast into the manhole by the precast Manufacturer. The manhole connector shall be A-Lok, Z-Lok, or Kor-N-Seal and conform to the requirements of ASTM C923 and shall be made from ethylene propylene rubber (EPDM) designed to be resistant to ozone, weather elements, chemicals, including acids, alkalis, animal and vegetable fats, oils, and petroleum products. Manhole sleeves shall be secured to pipe by stainless steel clamp and bolt assembly conforming to the requirements of ASTM C923 and ASTM A167.
- C. All stainless steel elements of the manhole connector shall be totally non-magnetic Series 304 Stainless, excluding the worm screw for tightening the steel band around the pipe which shall be Series 305 Stainless. The worm screw for tightening the steel band shall be torqued by a break-away torque wrench available from the precast manhole supplier, and set for 60-70 inch/lb. The connector shall be installed in the manhole wall by activating the expanding mechanism in strict accordance with the recommendation of the connector manufacturer. The connector shall be of a size specifically designed for the pipe material and size being utilized on the Project.

3.04 MANHOLE TESTING

- A. All manhole inserts, new manholes, and replacement manholes shall be tested by the Contractor using the vacuum test method, following the manufacturer's recommendations for proper and safe procedures. Vacuum testing of manholes and structures shall be performed after installation of inserts. Any leakage in the manhole or structure, before, during, or after the test shall be repaired at no additional cost to the County.
- B. Manholes:
 - 1. Prior to testing manholes for water tightness, all lift holes shall be plugged with a non-shrink grout, all joints between precast sections shall be properly sealed and all pipe openings shall be temporarily plugged and properly braced.
 - 2. Vacuum Tests shall be performed in accordance with ASTM C1244-11: If the manhole fails the initial test, necessary repairs shall be made with non-shrink grout. Retesting shall proceed until a satisfactory test is obtained. Vacuum testing equipment shall be as manufactured by P.A. Glazier, Inc., or approved equal.
- C. The Program Manager reserves the right to have third party consultants perform construction materials testing and assessments to any new manhole.
- D. The use of soapy water on the manhole walls to help determine the areas of leakage is permitted.

3.05 BACKFILL

The Contractor shall place and compact backfill materials, in the area of excavation surrounding manholes in accordance with the requirements Section 02324 – Trenching and Trench Backfilling section of these Specifications.

3.06 CLEANUP

- A. After the work has been completed and all testing acceptable, the Contractor shall clean up the work area.
- B. 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 Program Manager 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.
- C. 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 Program Manager at no additional cost to the County. The work site restoration work shall be completed in accordance with the requirements of Section 02480 – Site Restoration and Erosion Control.

3.07 DOCUMENTATION

The Contractor shall complete work on each asset as assigned via the County's

Computerized Work Order Management system. Upon start of work, the Contractor shall receive work orders as assigned by the Program Manager. The Contractor shall maintain and synchronize the status of each rehabilitation work order issued.

3.08 WARRANTY

- A. The Contractor shall guarantee the work for a warranty period of one (1) year from the date of final acceptance. If, at any time during the warranty period, any defect is identified the Contractor shall make repairs acceptable and at no additional cost to the County. 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 02700
PAVEMENT REPAIRS**

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Pavement Replacement.
- B. Surface Preparation.
- C. Equipment.
- D. Asphaltic Concrete Placement.
- E. Asphaltic Concrete Compaction.
- F. Cleaning and Protection.
- G. Standard Granite Curb, Grade B.
- H. Specialty Brick Paver Replacement.
- I. Special Brick Sidewalk Replacement.

1.02 RELATED SECTIONS

- A. Section 02710 – Concrete Curbs, Gutters, & Sidewalks

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 Program Manager for approval.
- B. Certificates:
 - 1. 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.
- C. GRADED AGGREGATE BASE DATA
- D. TACK COAT
- E. PRIME COAT
- F. GRADE "B" GRANITE CURB
- G. SPECIAL AND "SPECIALITY" BRICK PAVERS
- H. PAVING SUBCONTRACT INFORMATION
- I. CORE PATCH MATERIAL

1.05 PERFORMANCE REQUIREMENTS

- A. The Contractor shall comply with the performance standards and requirements established by the Georgia Department of Transportation.
- B. Paving: Pavement shall be designed for movement of trucks up to 60,000 lbs.
- C. General: 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 shall core the samples at locations and in the

manner directed by the Program Manager. The cuts made in taking such samples shall be repaired by the Contractor at no expense to the County other than for materials.

1.06 QUALITY ASSURANCE

- A. The Contractor shall perform Work in accordance with the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition.
- B. The Contractor shall obtain materials from the same source throughout the duration of the paving Work.
- C. The Contractor shall use only materials which are furnished by a bulk asphalt concrete producer regularly engaged in production of hot-mix, hot-laid asphalt concrete.

1.07 REGULATORY REQUIREMENTS

The Contractor shall conform to applicable code for paving work on public and private properties.

1.08 JOB CONDITIONS

- A. Weather Limitations:
 - 1. The Contractor shall apply bituminous prime and tack coats only when the ambient temperature in the shade has been at least forty (40) degrees F.
 - 2. The Contractor shall not conduct paving operations when the surface is wet, frozen, or contains excess moisture which would prevent uniform distribution and required penetration.
 - 3. The Contractor shall construct asphaltic courses only when atmospheric temperature in the shade is above thirty-five (35) 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 thirty-five (35) degrees F and rising. The Contractor shall not place base course on a frozen or muddy subgrade.
- B. The Contractor shall establish and maintain the required lines and grades, including crown and cross-slope, for each course during construction operations.
- C. Traffic Control: All traffic control measures shall comply with the requirements of MUTCD, Part 6 – Temporary Traffic Control, Latest Edition as published by USDOT/FHWA.

PART 2 – PRODUCTS

2.01 FLEXIBLE PAVEMENT

- A. Aggregates for asphaltic concrete shall comply with the applicable requirements of the Georgia Department of Transportation Standard Specifications Construction of Transportation Systems, latest edition.
- B. 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.
- C. 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 and Sidewalks.

2.04 SIDEWALKS

- A. Concrete for sidewalks shall be Class A conforming to the requirements of Section 02710 – Concrete Curbs, Gutters and Sidewalks.

2.05 DRIVEWAYS

- A. Concrete for driveways shall be Class A conforming to the requirements of Section 02710 – Concrete Curbs, Gutters and Sidewalks.

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 such that the minimum length employed shall not be less than four (4) feet long. Curb sections shall have a split face and split top. On wheel chair ramps and driveways, the granite curb shall continue through depressed sections of these elements. On curve section 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 Program Manager 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 SPECIAL 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 Program Manager for review 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.

PART 3 – EXECUTION

3.01 PAVEMENT REPLACEMENT

- A. The Contractor shall obtain prior approval from the County for any paving subcontracts.
- B. The Contractor shall replace all pavements following the guidelines established by the Georgia Department of Transportation.
- C. Where paved streets, sidewalks, driveways, and gutters are removed within the construction limits as specified, such replacement shall be paid for at the respective unit prices in the Bid Form. Such pavements removed or damaged by the Contractor beyond the specified construction limits shall be replaced in accordance with these specifications at the Contractor's expense.
- 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 that were removed as an incidental part of the Work and no specific payment therefore shall be allowed. Unpaved drives shall be topped with gravel at no additional cost to the County.
- 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. Service lines and small diameter pipes, eight (8) inches in diameter or less located across paved surfaces shall be installed by boring or other approved methods that will not require cutting or removing the pavement where feasible.
- G. All concrete pavement replaced shall not be less than four (4) inches thick or equal to the original if greater than four (4) inches.
- H. Pavements replaced shall be of the same type of construction as was removed, except that 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 conformity with elevations and 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, unless continuing tests indicate that the required results are being obtained with thicker layers.
3. In no case shall more than eight (8) inches of compacted base be placed in one lift.
4. The Contractor shall spread, shape, and compact all aggregate base material deposited on the subgrade during the same day.
5. The compacted base shall have sufficient stability to support construction traffic without pumping.
6. 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 recompacted.

B. Loose and Foreign Material:

1. The Contractor shall remove loose and foreign material from the surface immediately before application of 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 subbase 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 volatile, and in no case less than twenty-four (24) hours unless otherwise acceptable to the Program Manager.
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 within the Project Schedule. NO CHANGES IN EQUIPMENT, EQUIPMENT SPEED OR EQUIPMENT PATTERNS WILL BE PERMITTED ONCE TEST STRIPS ARE APPROVED. IF CHANGES ARE MADE, NEW TEST STRIPS SHALL BE PERFORMED AT THE CONTRACTORS EXPENSE, INCLUDING ALL NECESSARY TESTING.
- B. Bituminous pavers shall be self-propelled that 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, and 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. The Contractor shall spread the asphaltic concrete mixture at a minimum temperature of two-hundred and twenty-five (225) degrees F.
- 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 acceptable to the Program Manager.
- E. Pavement Placing:
 1. Unless otherwise directed by the Program Manager, 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 Program Manager.
2. The Contractor shall place the asphaltic concrete mixture at a rate that will ensure handling and compaction before mixture becomes cooler than acceptable working temperature.

G. 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.
- H. Second Rolling:
1. The Contractor shall follow breakdown rolling as soon as possible, while the asphaltic concrete mixture is hot and in condition for compaction.
 2. The Contractor shall continue second rolling until the asphaltic concrete mixture has been thoroughly compacted.
- I. Finish Rolling:
1. The Contractor shall perform finish rolling while the asphaltic concrete mixture is still warm enough for removal of roller marks.
 2. The Contractor shall continue rolling until roller marks are eliminated and the course has attained specified density.
- J. Patching:
1. The Contractor shall remove and replace defective areas.
 2. The Contractor shall cut-out and fill with fresh, hot asphalt concrete.
 3. The Contractor shall compact by rolling to specified surface density and smoothness.
 4. The Contractor shall remove deficient areas for full depth of course.
 5. The Contractor shall cut sides perpendicular and parallel to direction of traffic with edges vertical.
 6. The Contractor shall apply tack coat to exposed surfaces before placing new asphaltic concrete mixture.

3.06 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 Program Manager.
- 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 Program Manager.

3.07 STANDARD GRANITE CURB, GRADE B

- A. This work shall consist of furnishing and installing the standard granite curb as directed by the Program Manager. In general, granite curb required to be installed shall match existing granite curb that has been removed or damaged in the progress of the Work.
- B. Installation of 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, excavation of base and subgrade as necessary to install the granite curbing and backfilling and compacting of the installation.

3.08 SPECIALTY BRICK PAVER REPLACEMENT

- A. This work shall consist of replacing existing brick pavement required to be removed for installation of 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. 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.

3.09 SPECIAL BRICK SIDEWALK REPLACEMENT

- A. This work shall consist of replacing existing brick sidewalks required to be removed for connection of services or for installation of 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

SECTION 02710
CONCRETE CURBS, GUTTER, SIDEWALK AND DRIVEWAY REPAIRS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Preparation of Subgrade.
- B. Setting Forms.
- C. Curb Construction.
- D. Sidewalk Construction.
- E. Driveway Construction

1.02 RELATED SECTIONS

- A. Section 02700 - Pavement Repairs
- B. Section 03300 – Cast-in-Place Concrete

1.03 SUBMITTALS

- A. The Contractor shall submit concrete mix design for curbs, gutters, sidewalks and driveways design to the Program Manager for approval.
- B. The Contractor shall submit the following for approval if required of the specific project application:
 - 1. Curing compound
 - 2. Expansion joint
 - 3. Standard granite curb, grade B
 - 4. Specialty brick paver materials

PART 2 – PRODUCTS

2.01 FORMS

- A. Materials for curb forms shall be standard metal, wood, or fiberglass forms free from defects which would impair the appearance or structural quality of the completed curb. Form material for the face of the curb shall not have any horizontal joints closer than seven (7) inches from the top of the curb. The Contractor shall provide stakes and bracing materials as required to hold forms securely in place.
- B. Materials for sidewalk and driveway forms shall be standard metal forms. The Contractor shall provide stakes and bracing materials as required to hold forms securely in place.
- C. Use flexible spring steel forms or laminated boards to form radius bends as required.

2.02 CRUSHED ROCK BASE

- A. Crushed rock base shall consist of clean three-quarters (3) inch or smaller crushed rock or crushed gravel, free from foreign material and meeting the Georgia Department of Transportation Standard Specifications, Construction and Transportation Systems, latest edition.

2.03 EXPANSION JOINT FILLER

- A. Expansion joint filler shall be one-half (1/2) inch thick, preformed asphalt-impregnated, expansion joint material conforming to the requirements of ASTM D994.

2.04 CONCRETE

- A. Concrete shall be Ready-Mix, Class A, 3,000 psi compressive strength, conforming to ASTM C94.

2.05 CURING COMPOUND

- A. Liquid membrane-forming curing compound shall be clear or translucent, suitable for spray application and shall conform to the requirements of ASTM C309, Type 1.

PART 3 – EXECUTION

3.01 PREPARATION OF SUBGRADE

- A. The Contractor shall bring the areas on which curbs and sidewalks are to be constructed to required grade on undisturbed ground and compact by sprinkling and rolling or mechanical tamping. As depressions occur, the Contractor shall refill with suitable material and re-compact.

3.02 SETTING FORMS

- A. The Contractor shall construct forms to the shape, lines, grades, and dimensions shown on the Plans. The Contractor shall stake wood or steel forms securely in place, true to line and grade.
- B. Forms on the face of the curb shall not have any horizontal joints within seven (7) inches of the top of the curb. The Contractor shall brace forms to prevent change of shape or movement in any direction resulting from the weight of the concrete during placement. The Contractor shall construct short-radius curved forms to exact radius. Tops of forms shall not depart from grade line more than one-eighth (1/8) inch when checked with a ten (10) foot straightedge. Alignment of straight sections shall not vary more than one-eighth (1/8) inch in ten (10) feet.

3.03 CURB CONSTRUCTION

- A. The Contractor shall construct curbs to line and grade shown on the Plans. Curbs shall conform to the details shown on the Plans.

- B. The Contractor shall place preformed asphalt-impregnated expansion joints at intervals not exceeding fifty (50) feet and at the beginning and end of curved portions of the curb and where abutting existing surfaces.
- C. The Contractor shall place contraction joints in the curb at intervals not exceeding fifteen (15) feet. Contraction joints shall be of the open joint type and shall be provided by inserting a thin, oiled steel sheet vertically in the fresh concrete to force coarse aggregate away from the joint. The steel sheet shall be inserted in the full depth of the curb. The Contractor shall place, process, finish, and cure concrete in conformance with the applicable requirements of ACI 614, and the requirements of this section. Whenever the requirements differ, the more stringent shall govern. After initial set has occurred in the concrete and prior to removing the front curb form, steel sheet shall be removed with a sawing motion. The Contractor shall finish top of curb with a steel trowel and finish edges with a steel edging tool.
- D. As soon as the concrete has set sufficiently to support its own weight, the Contractor shall form and finish all exposed surfaces. The Contractor shall finish formed face by rubbing with a burlap sack or similar device that will produce a uniformly textured surface, free of form marks, honeycomb, and other defects. All defective concrete shall be removed and replaced at the Contractor's sole expense. Upon completion of the finishing, the Contractor shall apply an approved curing compound to exposed surfaces of the curb. Curing shall continue for a minimum of five (5) days. The Contractor shall protect the curb from damage for a period of seven (7) days from the date of pouring.
- E. Upon completion of the curing period, but not before seven (7) days have elapsed since pouring the concrete, the Contractor shall backfill the curb with earth, free from rocks two (2) inches or larger and other foreign material. The Contractor shall tamp backfill firmly in place.
- F. Finished curb shall present a uniform appearance for both grade and alignment. The Contractor shall remove any section of the curb showing abrupt changes in alignment or grade, or which is more than one-quarter (1/4) inch away from its location as staked, and construct new curb in its place at the Contractor's sole expense.

3.04 SIDEWALK CONSTRUCTION

- A. Sidewalks shall be four (4) inches thick in walk areas and six (6) inches thick in driveway areas.
- B. At locations where the new sidewalks are to abut existing concrete, the Contractor shall saw concrete for a depth of one-half (1/2) inch and chip the old concrete back to sound material on a straight line, clean the surface, and apply a neat cement paste just prior to pouring the new sidewalk.
- C. The Contractor shall place preformed asphalt expansion joints as in the adjacent curb, where the sidewalk ends at a curb, and around posts, poles, or other objects protruding through the sidewalk.
- D. The Contractor shall provide contraction joints transversely to the walks at locations opposite the contraction joints in the curb. These joints shall be three- sixteenths (3/16) inch weakened plane joints. They shall be straight and at right angles to the surface of the walk.

- E. The Contractor shall place, process, finish, and cure concrete in conformance with the applicable requirements of ACI 614 and the requirements of this section. Where the requirements differ, the more stringent shall govern.
- F. The Contractor shall broom the surface with a fine-hair broom at right angles to the length of the walk and tool all edges, joints, and markings. The Contractor shall mark the walks transversely at five (5) foot intervals with a joining tool. Upon completion of the finishing, the Contractor shall apply an approved curing compound to exposed surfaces. The Contractor shall protect the sidewalk from damage for a period of seven (7) days from the date of pouring. **DAMAGED SIDEWALK SHALL BE REPLACED AT NO ADDITIONAL COST.**

3.05 DRIVEWAY CONSTRUCTION

- A. Driveways shall be minimum of six (6) inches thick.
- B. At locations where the new driveways are to abut existing concrete, the Contractor shall saw concrete for a depth of one-half (1/2) inch and chip the old concrete back to sound material on a straight line, clean the surface, and apply a neat cement paste just prior to pouring the new concrete. If existing driveway has reinforcing, same shall be put back matching existing. Dowel and epoxy bars in to existing if required by Program Manager.
- C. The Contractor shall place preformed asphalt expansion joints as in the adjacent curb, where the driveway ends at a curb.
- D. The Contractor shall provide contraction joints transversely to the walks at locations opposite the contraction joints in the curb. These joints shall be three- sixteenths (3/16) inch weakened plane joints. They shall be straight and at right angles to the surface of the driveway.
- E. The Contractor shall place, process, finish, and cure concrete in conformance with the applicable requirements of ACI 614 and the requirements of this section. Where the requirements differ, the more stringent shall govern.
- F. The Contractor shall broom the surface with a fine-hair broom at right angles to the length of the drive and tool all edges, joints, and markings. The Contractor shall mark the drives transversely at fifteen (15) foot intervals with a joining tool.
- G. Upon completion of the finishing, the Contractor shall apply an approved curing compound to exposed surfaces. The Contractor shall protect the driveway from damage for a period of seven (7) days from the date of pouring.

END OF SECTION

SECTION 02900
SANITARY SEWER MANHOLE REHABILITATION

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This section of these Specifications provides for rehabilitating manholes to include the repair/replacement/rebuilding/sealing of the base, trough, bench, walls, and cone, and removal of unsound construction material. Work includes surface preparation, sealing, and testing.

1.02 RELATED SECTIONS

- A. Section 01520: Sewer Flow Control
- B. Section 02276: Site Restoration and Erosion Control

1.03 REFERENCES

- A. The following published standards from the American Society for Testing and Materials International (ASTM)

ASTM C78	Flexural Strength of Concrete (Using Simple Beam With Third-Point Loading)
ASTM C109	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimen)
ASTM C157	Length Change of Hardened Hydraulic-Cement Mortar and Concrete
ASTM C-191-08	Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle
ASTM C882	Standard Test Method for Bond Strength of Epoxy- Resin Systems Used With Concrete by Slant Shear
ASTM C876	Half-Cell Potentials of Uncoated Reinforcing Steel in Concrete
ASTM D543	Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents
ASTM D638-10	Standard Test Method for Tensile Properties of Plastics
ASTM D695-10	Standard Test Method for Compressive Properties of Rigid Plastics
ASTM D-790	Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

ASTM D2240-05 (2010)	Standard Test Method for Rubber Property— Durometer Hardness BS 7816-3:1998- (ASTM D2240-75 not found; this standard published 07/15/1998 by British Standards Institution.)
ASTM D2566	Withdrawn Standard: ASTM D2566 Test Method for Linear Shrinkage of Cured Thermosetting Casting Resins During Cure (Withdrawn 1993)
ASTM D2584	Standard Test Method for Ignition Loss of Cured Reinforced Resins
ASTM D4414	Standard Practice for Measurement of Wet Film Thickness by Notch Gages
ASTM D4541	Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
ASTM D4787	Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates

- B. International Concrete Repair Institute (ICRI) Technical Guideline No. 03730 - Surface Preparation Guidelines for the Repair of Deteriorated Concrete Resulting From Reinforcing Steel Corrosion.
- C. 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. All Submittals shall be received and approved by the Program Manager prior to beginning work.
- B. The Contractor shall submit the following items at least thirty (30) calendar days prior to starting manhole/vault rehabilitation:
 1. Manufacturers' Certificate of Compliance certifying compliance with the applicable specifications and standards. The certifications shall list all materials furnished under this Section and confirm the materials furnished for rehabilitation system selected are compatible with one another.
 2. Certified copies of factory test reports required by the applicable standards, the manufacturer, and this Section.
 3. Manufacturer's handling, storage, and installation instructions and procedures.
 4. Manufacturer's Certification indicating the installer is approved to install specified rehabilitation system.
 5. Documentation of successful projects in the specified rehabilitation system and confirmation of required experience.

6. Shop drawings and samples for any material proposed as equal to a specified material. The Contractor shall submit sufficient manufacturer's information to include, but not be limited to, the rehabilitation system, equipment components, material/chemical properties, mixing and proportioning requirements, maximum pot life, film/coating thickness, curing, and environmental requirements for application
- C. The Contractor shall complete, and provide to the Program Manager, 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 (e.g., specialty cleaning, by-pass equipment, etc.).
 4. Submittals: To the Program Manager.
 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/QUALIFICATIONS

- A. The supervisor of the field crews shall have received proper training and have a minimum of three (3) years' experience in applying the specified product(s) covered under this section of the Specifications, practicing safe working practices and confined space entry procedures, and using the types of equipment and product/materials required. Submit confirming documentation.
- B. Field crew leaders shall have received proper training in this function and have a minimum of two (2) years' experience in applying the specified product(s) covered under this section of the Specifications, practicing safe working practices and confined space entry procedures, and using the types of equipment and product/materials required. Submit confirming documentation.
- C. Experience shall include, at a minimum, projects successfully completed, incorporating not less than 250 manholes and performed within the last 10 years using the specified rehabilitation system. Submit confirming documentation.
- D. No crewmembers shall enter confined spaces without the necessary certified training as required under applicable Federal, State, and local laws, regulations, standards, policies, procedures, and requirements, and permit.

1.06 LINING SYSTEMS

The lining system used shall result in a monolithic structure to the shape and contour of the interior of the existing manhole. The lining system shall be completely watertight and free of any joints or openings other than pipe inlets, pipe outlets and the rim opening. The junction of the lining material with the pipe material at the inlets and outlets shall be watertight.

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

A. Reference Specification Section 01030 – Special Project Procedures.

1.08 SAFETY

A. All work shall be performed in accordance with OSHA standards and local, 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

2.1 GENERAL

A. Materials:

1. The materials used shall be designed, manufactured, and intended for sewer manhole/vault rehabilitation and the specific application for which they are used. The materials shall have a proven history of performance in sewer manhole/vault rehabilitation for a minimum of 10 years nationally, regarding similar age, groundwater levels, and environmental characteristics. The materials shall be delivered to the Work Site in original unopened packages and clearly labeled with the manufacturer's identification and printed instructions. All materials shall be stored and handled per the manufacturer's published recommendations. All materials shall be mixed and applied per the manufacturer's written instructions.
2. The Contractor shall warrant and save harmless the Owner against all claims for patent infringement and any loss thereof.
3. Dispose of all wastes in accordance with applicable regulations.
4. Each coating/lining system shall be designed for application over wet surfaces, but not active running water, without degradation of the final product and/or the bond between the product and the manhole/vault surfaces.

B. Pressure grout active leaks:

1. Pressure grout shall be an acrylamide gel pressure sealant system provided by a single manufacturer. The acrylamide gel pressure sealant system shall consist of a dry powder chemical readily dissolvable in water to form a low viscosity solution stiffening to a gel when mixed with an aqueous persulphate catalyst and a triethanolamine activator.

2. During injection, chemical sealant shall be able to react in presence of infiltrating water.
 3. The system shall have the following characteristics:
 - a. A minimum of ten (10) percent acrylamide base material by weight in the total sealant mix.
 - b. A higher concentration (percent) of acrylamide base material may be used to increase strength or offset dilution during injection.
 - c. Capable of withstanding submergence in water without degradation.
 - d. Prevent passage of water through manhole defect
 - e. Flexible as opposed to brittle or rigid.
 - f. In place, able to withstand freeze/thaw and wet/dry cycles without adversely affecting seal.
 - g. Mixing of component materials shall be compatible with field conditions
 - h. Residual sealing materials shall be easily removable from manhole bench.
 - i. Constant viscosity during reaction period.
 - j. Additives to increase viscosity, adjust cure time though the range of ten (10) seconds to one (1) hour, density, shrinkage, compressive strength, tensile strength, and pH.
 - 1) Diatomaceous earth (Celite 209 or equal) can be added to concentration of five percent.
 - 2) Use of other additives following manufacturer's recommendation and County Engineer's approval.
 - k. Cured product shall be resistant to dehydration, homogeneous, chemically stable, non-biodegradable, firm, flexible gel. Any suggested manufacturer and material identification.
 - l. Root control additive 2, 6-Dichlorobenzonitrile, may be added following manufacturer's recommendation and the Program Manager's direction. Any suggested manufacturer and material identification.
- C. Stopping active leaks (hydraulic cement):
1. A premixed fast-setting product, specifically formulated for leak control, creating a volume-stable waterproof cement plug consisting of hydraulic cement, graded silica aggregates, special plasticizing and accelerating agents. It shall not contain chlorides, gypsum's, plasters, iron particles, aluminum powder or gas-forming agents, or promote the corrosion of steel it may come in contact with. Set time shall be approximately one (1) minute. Ten (10) minute compressive strength shall be approximately 500 psi.
 - a. The product shall be designed to rapidly stop flowing leaks in vertical and horizontal, concrete and masonry surfaces.

Cure Time	Compressive Strength ASTM C109	Tensile Strength ASTM C496
1 day	3500 psi	-----
7 day	4900 psi	290 psi
28 day	5500 psi	575 psi

- b. Hydraulic cement shall be manufactured by Quadex, Madewell Products Corporation, Fosroc, IPA Systems, or approved equal.
 - 2. A silicate-based liquid accelerator field mixed with neat Portland cement. The set time shall be approximately one (1) minute.
 - 3. The elastomeric polyurethane resin-soaked method, using dry twisted jute oakum, or resin-rod with polyurethane resin (water activated).
- D. Patching, repointing, filling, and repairing non-leaking holes, cracks, and spalls in concrete and masonry manholes (Cement Mortar):
- 1. A premixed non-shrink cement-based patching material consisting of hydraulic cement, graded silica aggregates, special plasticizing and accelerating agents, which has been formulated for vertical or overhead use. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder, or gas-forming agents or promote the corrosion of steel it may come into contact with. Set time (ASTM C-191) shall be less than thirty (30) minutes. One- (1) hour compressive strength (ASTM C-109) shall be a minimum of 200 psi and the ultimate compressive strengths (ASTM C-882- Modified) shall be a minimum of 1700 psi.
 - 2. The product shall display the following properties:

	Strength (psi)		
	Day	7 Day	28 Day
Compressive Strength (ASTM C 109)	3,875	4,550	6,190
Flexural Strength (ASTM C 78)	-----	825	985
Tensile Strength (ASTM C 496)	-----	290	575
Shrinkage (ASTM C 157, Modified)	0.04 Percent @ 28 Days		

- 3. Shall be a factory blended, low shrinkage, high strength, polymer modified, sprayable, microsilica mortar.
 - 4. The cement mortar shall be QM-1s Restore by Quadex, Inc., Mainstay ML-72 by Madewell Products Corporation, or approved alternate.
- E. Spray applied or centrifugally cast lightweight structural reinforced cement manhole lining (Cement Mortar):
- 1. A premixed non-shrink cement-based patching material consisting of hydraulic cement, graded silica aggregates, special plasticizing and accelerating agents, formulated for vertical or overhead use. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder, or gas-forming agents or promote the corrosion of steel it may come into contact with. Set time (ASTM C-191) shall be less than 30 minutes. One-

hour compressive strength as required in ASTM C-109. The product shall display the following properties:

	Strength (psi)		
	Day	7 Day	28 Day
Compressive Strength (ASTM C 109)	3,875	4,550	6,190
Flexural Strength (ASTM C 78)	-----	825	985
Tensile Strength (ASTM C 496)	-----	290	575
Shrinkage (ASTM C 157, Modified)	0.04 Percent @ 28 Days		

2. Shall be a factory blended, low shrinkage, high strength, polymer modified, sprayable, microsilica mortar.
3. Shall be suitable for low-pressure spray or trowel application for the repair of vertical and horizontal concrete and masonry structures.
4. Cement mortar shall be QM-1s Restore by Quadex, Inc., MS-2A by Strong, Silatec MSM by CemTec (A.W. Cook Cements), SewperCoat or approved alternate.

F. Spray applied corrosion protection (epoxy coating):

1. Only structures exhibiting damage due to corrosion shall receive the epoxy coating.
2. The material sprayed onto the surface of the manhole shall be one-hundred percent (100%) solids high build epoxy coating formulated for application within a sanitary sewer environment.
3. The coating thickness shall be a minimum of 125 mils in one (1) or two (2) multi-pass coats.
4. The coating color shall typically be white or off white.
5. If an adhesion coating is required between the concrete structure and the epoxy coating, the cost of the adhesion coat is included in the cost of the 100% solids, high build epoxy coating.
6. Manufacturer's published directions regarding surface preparation shall be followed and is included in the cost of the 100% solids, high build epoxy coating. Manufacturer shall approve preparation of surface prior to application.
7. The cured epoxy resin system shall conform to the following minimum structural standards:

	Strength (psi)
Compressive Strength (ASTM D-695)	13,000
Flexural Strength (ASTM D-790)	13,000
Tensile Strength (ASTM D-638)	7,000
Flexural Modulus (ASTM-790)	500,000

8. The epoxy coating shall be Mainstay DS-5 by Madewell Products Corporation, Raven 405 by Raven Lining Systems, Cor-Cote SC (Sewer Coat) by Sherwin- Williams or approved alternate.
9. Composite structure/corrosion protection system.
10. Only structures exhibiting damage due to corrosion shall receive the composite system.
11. The coating thickness shall be a minimum of ½-inch.
12. If an adhesion coating is required between the concrete structure and the composite system, the cost of the adhesion coat shall be included in the cost of the composite system.
13. The composite system shall be SewperCoat by Lafarge Aluminates or approved alternate.

PART 3 – EXECUTION

3.01 REHABILITATION OF MANHOLE STRUCTURE

- A. Contractor to provide the following items, but not limited to, as directed by the Program Manager:
 1. Drill and pressure grout all active leaks.
 2. Repair leaking crack, joint and/or lift hole with hydraulic cement mortar.
 3. Repair non-leaking crack, joint and/or lift hole with non-shrink cement based mortar.
 4. Restore the structural integrity by lining the manhole with cement mortar.
 5. Provide corrosion barrier by lining the manhole with an epoxy coating.
 6. Restore the structural integrity of the manhole while providing corrosion barrier by installing a fiberglass insert liner.
 7. Rebuild bench and trough using TYPE S cement mortar.
 8. Provide thickness gauges, wet film gauges and other testing equipment to test the thicknesses, surface profiles and coating continuity as required by this specification.
 9. Perform and pass vacuum test of a manhole.
 10. Provide survey grade (+/- 0.01-foot) data on a manhole using GPS.
 11. Provide survey grade (+/- 0.01-foot) data on a manhole using conventional survey methods.
 12. Provide bypass pumping to facilitate rehabilitation activities.
 13. Provide manhole condition assessment services.
 14. Locate and expose buried manholes, adjust frame and cover heights as required
 15. Install internal frame seal and external seal wraps

16. Remove intruding pipe or obstruction
17. Remove manhole steps

B. General Procedures:

1. **Cleaning:** All concrete and masonry surfaces to be rehabilitated shall be clean. All grease, oil, laitance, coatings, loose bricks, mortar, unsound brick or concrete and other foreign materials shall be completely removed. Initial cleaning shall be done by utilizing a minimum 5000 psi pressure washer with the proper nozzles; however, additional required cleaning shall be accomplished by other methods including but not limited to wet or dry sandblasting, acid wash, concrete cleaners, degreasers or mechanical means, as may be required to properly provide additional cleaning of the surface. All surfaces using these methods shall be thoroughly rinsed, scrubbed, neutralized and tested with test strips, in order to confirm the removal of all cleaning agents and their reactant products. Debris resulting from cleaning shall be removed from the manhole and not discharged downstream. The debris is to be disposed of properly in accordance with all 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 quantities are to be tracked in the daily Contractor diary.
2. **Stopping Infiltration:** After surface preparation and prior to the application of mortars and coatings, infiltration shall be stopped either by plugging with a hydraulic cement or chemical grout sealing.
3. **Patching:** All large holes and/or voids, joints or pipes, all spalled areas, all lifting holes and all holes caused by missing or cracked brick shall be patched and all missing mortar repointed using a non-shrink cement mortar. All cracked or disintegrated material shall be removed from the area to be patched or repointed, exposing a sound sub-base. All cracks not subject to movement
4. shall be cleaned to remove all unsound material so a solid fixed surface is established and patched with non-shrink patching mortar. If any reinforcing is exposed, a corrosion inhibiting product shall be used to coat the steel prior to patching.
5. **Manhole Walls:** The thicknesses of the patches, coatings, etc. must form a uniform, vertical wall established from the manhole bench to the manhole cone section.
6. **Flow Control:** The Contractor shall be responsible for Wastewater Flow Control in accordance with 01520 Sewer Flow Control.
7. The Contractor shall remove all foreign material, loose grout, debris and rubble from the existing channel. The Contractor shall rebuild the existing channel, if required, by reshaping or repairing the slope of shelves or benches. Manhole rehabilitation work shall include aligning inflow and outflow ports to prevent the deposition of solids at the transition point. All troughs shall follow the grades of the pipe entering the manhole. Changes in direction of the sewer and entering branch or branches shall have a true curve as large a radius as the size of the

manhole will permit, but will be shaped to allow easy entrance of maintenance equipment including buckets, T.V. camera, etc.

8. Manhole steps: The Contractor shall remove all manhole steps prior to rehabilitation. No steps shall be installed after rehabilitation.
 9. Each lining system shall be installed in accordance with the manufacturer's recommendation to withstand groundwater pressures. For manholes greater than twelve (12) feet in depth, the lining shall be capable of withstanding the pressures associated with a groundwater depth equal to the manhole depth. Linings for all other manholes shall be capable of withstanding the pressures associated with groundwater depth of twelve (12) feet. The Contractor shall measure groundwater depth from manhole bench to top of ground surface.
- C. Application of products shall be by factory certified applicators. Submit confirming documentation of certification.

3.02 SPRAY APPLIED LIGHTWEIGHT STRUCTURAL REINFORCED CEMENT

- A. The surface prior to spraying shall be properly prepared and cleaned and be damp without noticeable free water droplets or running water. Materials shall be spray-applied to a minimum uniform thickness to ensure all cracks, crevices, and voids are filled and a smooth surface remains after light troweling. The light troweling is performed to compact the material into voids and to set the bond.
- B. The first application shall have begun to take an initial set (disappearance of surface sheen, lasting from 15 minutes to 1 hour depending upon ambient conditions) before the second application to assure a minimum total finished thickness of 1/2 inch. The final finished thickness may need to be greater than the 1/2 inch recommended by the manufacturer to withstand groundwater pressures. A depth gauge shall be used during application, at various locations, to verify the required thickness. The readings are to be recorded in the Contractor's Daily Report. The surface then shall be troweled to a smooth finish with care taken to not over trowel in a manner bringing additional water to the surface and weaken it. The Contractor shall follow the manufacturer's recommendations.
- C. The bench covers used to catch debris and rebound shall be removed and the bench and trough sprayed so a gradual slope is produced from the walls to the trough with the thickness at the edge of the trough being no less than 1/2 inch. The wall-bench intersection shall be rounded to a uniform radius the full circumference of the intersection.
- D. No application shall be made to frozen surfaces or if freezing is expected to occur within the manhole for twenty-four (24) hours after application. If ambient temperatures are in excess of 95° F, precautions shall be taken to keep the mix temperature at time of application below 90° F, using ice if necessary. Contractor shall monitor and maintain the temperatures within the range required by the manufacturer. The contractor shall provide a hi/lo thermometer and record the readings in the daily report.
- E. The final application shall have a minimum of four (4) hours cure time before being subjected to active flow.

3.03 CENTRIFUGALLY CAST STRUCTURAL REINFORCED CEMENT

- A. The rotating casting applicator shall be positioned to evenly apply the material and be withdrawn at a rate to assure a final minimum thickness of 1/2-inch. The final finished thickness may need to be greater than 1/2-inch, as recommended by the manufacturer, to withstand groundwater pressures. A depth gauge shall be used during application, at various locations, to verify the required thickness. The readings are to be recorded in the Contractor's Daily Report. The surface shall be troweled to a smooth finish with care being taken to not over trowel in a manner bringing additional water to the surface and weaken it.
- B. The bench covers used to catch debris and rebound shall be removed and the bench and trough sprayed or hand applied so a gradual slope is produced from the walls to the trough with the thickness at the edge of the trough being no less than 1/2-inch. The wall-bench intersection shall be rounded to a uniform radius the full circumference of the intersection. The surface shall be troweled to a smooth finish with care taken to not over trowel in a manner bringing additional water to the surface and weaken it.
- C. No application shall be made to frozen surfaces or if freezing is expected to occur within the manhole for 24 hours after application. If ambient temperatures are in excess of 95° F, precautions shall be taken to keep the mix temperature at time of application below 90° F. Contractor shall monitor and maintain the temperatures within the range required by the manufacturer. The contractor shall provide a hi/lo thermometer and record the readings in the daily report.
- D. The final application shall have a minimum of one (1) hour cure time before being subjected to active flow.

3.04 EPOXY COATING

- A. The epoxy coating shall be applied onto the interior surfaces of the manhole to produce a smooth coating and yield the required minimum thickness. A depth gauge shall be used during application at various locations to verify the required thickness. The readings are to be recorded in the Contractor's Daily Report.
- B. The epoxy resin shall be applied at the required recommended thickness. The application shall have a minimum of three (3) hours cure time at required temperatures before being subjected to active flow.
- C. Conduct and record WFT tests during application and have Tooke gauge (DFT) tests done after application. Also suggest that high voltage holiday tests be required contingent upon required millage. All tests shall be conducted at the contractor's expense, by an independent NACE certified technician, and shall be witnessed by the Program Manager. Results of tests to be provided to Program Manager. Owner reserves the right to verify testing. Results of Owner's test takes precedence.
- D. An epoxy putty or other surfacer recommended by the epoxy manufacturer shall be used as necessary to repair any slight surface irregularities prior to applying epoxy.
- E. The sloped surface of the manhole bench shall be made non-skid by broadcasting aluminum oxide or sand into the surface prior to gelatin/set.

3.05 MANHOLE REHABILITATION ACCEPTANCE

- A. All manholes rehabilitated using cement mortar lining, epoxy lining, or fiberglass insert lining, including repairs of active leaks shall be subject to testing using the vacuum test method. The Contractor shall follow the manufacturer's recommendations for proper and safe procedures. Vacuum testing manholes shall be performed after curing of linings. Any visible leakage in the manhole or structure, before, during, or after the test shall be repaired regardless of the test results.
- B. If the manhole fails the vacuum test, the Contractor shall perform additional repairs, at no additional cost to the Owner, and repeat the test procedures until obtaining satisfactory results.
- C. All pipes for vacuum testing entering the manhole shall be installed at the top access point of the manhole.
- D. A vacuum of ten (10) inches of mercury (Hg) (5.0 psi) shall be drawn on the manhole, and the time shall be measured for the vacuum to drop to nine (9) inches of mercury (Hg) (4.5 psi). Manholes will be considered to have failed the air test if the time to drop one (1) inch of mercury is less than what is shown in the following table:

Vacuum Test Timetable				
Manhole Diameter - Inches				
Depth - feet	48 inches	60 inches	72 inches	96 inches
4	30 sec.	30 sec.	30 sec.	30 sec.
8	30 sec.	30 sec.	32 sec.	38 sec.
12	30 sec.	39 sec.	48 sec.	57 sec.
16	40 sec.	52 sec.	64 sec.	76 sec.
20	50 sec.	65 sec.	80 sec.	95 sec.
24	60 sec.	78 sec.	96 sec.	114 sec.
+ Each 2'	+5 sec.	+6.5 sec.	+8.0 sec.	+9.5 sec.

- E. Manhole depths shall be rounded to the nearest foot. Intermediate values shall be interpolated. For depths above twenty-four (24) feet, the Contractor shall add the values listed in the last line of the table for each two (2) feet of additional depth.
- F. After the manhole rehabilitation work has been completed, the Contractor shall visually inspect the manhole. The finished surface shall be free of blisters, "runs" or "sags" or other indications of uneven lining thickness. The finished surface shall not have any evidence of visible leaks.

3.06 MANUFACTURER CERTIFICATION

- A. 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.

3.07 CLEANUP

- A. After the work has been completed and all testing acceptable, the Contractor shall clean up the work area.

- B. All debris and excess materials 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 the Contractor is authorized to dispose of the non-hazardous materials. Debris and liquid type and quantities are to be tracked in the daily Contractor diary. Hauling and disposal costs will be borne by the Contractor.
- C. 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 Program Manager at no additional cost to the Owner. The work site restoration work shall be completed in accordance with the requirements Section 02276 – Site Restoration and Erosion Control.

3.08 DOCUMENTATION

- A. The Contractor shall complete work on each asset as assigned via the Owner's Computerized Work Order Management system. Upon starting the work, the Contractor shall receive work orders as assigned by the Program Manager. The Contractor shall maintain and synchronize the status of each rehabilitation work order issued.

3.09 WARRANTY

- A. The Contractor shall guarantee the work for a warranty period of one (1) year from the date of final acceptance. If, at any time during the warranty period, any defect 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 02956
SANITARY SEWER CLEANING

PART 1 – GENERAL

1.01 SECTION includes

- A. This section includes specifications for sewer line cleaning to remove foreign materials and debris from the mains and restore the pipe to a minimum of 95% of the through flow channel and cross section, for clear viewing of the interior surfaces of the lines during television inspection, or as required for other specified rehabilitation or purpose.

1.02 Related Sections

- A. Section 01510: Sanitary Sewer Main Television and Sonar Inspection
- B. Section 01520: Sewer Flow Control

1.03 References

- A. Codes, Specifications, and Standards
- B. NASSCO – National Association of Sewer Service Companies
- C. Testing and Materials Standards

1.04 Qualifications

- A. Qualification documentation will be submitted as required of the Contract Documents.
- B. The Contractor must meet all of the following criteria to be considered qualified to submit:
 - 1. The Contractor, or their subcontractor, must document they, not their parent company or related company or the experience of an individual/s, have been in this line of business a minimum of five (5) years.
 - 2. The Contractor, or their subcontractor, must document they, not their parent company or related company or the experience of an individual/s, have cleaned a minimum of 300,000 linear feet of sewer mains of the sizes involved for this contract in the past two (2) years. This documentation shall include locations, references (including names and phone numbers), pipe sizes and linear footages of those sizes.

1.05 Submittals

- A. Prior to commencing work contractor is to submit to the Program Manager a cleaning plan that should include but not be limited to: proposed equipment to be used for both cleaning and heavy cleaning (including limitations of the equipment, such as pipe material limitations), equipment used for verification of completed work,

QA/QC plan, health and safety plan, disposal facility to be used, and a contingency plan,

- B. References: Contact names and telephone numbers
- C. Traffic and Quality Control Plan
- D. At the end of each work week the contractor is to submit to the Program Manager all documentation described in section 3.05.
- E. Debris disposal tickets from approved landfill
- F. Documentation of Experience as indicated below. The documentation shall be submitted to the Project Manager.

1.06 EXPERIENCE

- A. Experience documentation will be submitted as required of the Contract Documents. The Contractor shall provide the County and Program Manager with written documentation 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, contact name and phone number. Documentation on any person shall not be longer than 1-page.
- B. Supervisor of the field crews must be proper trained in this function and have a minimum of (3) years' experience in performing sanitary sewer cleaning including safe working practices, proper cleaning procedures, and experience operating the types of cleaning equipment used for this contract.
- C. Field crew leaders must be proper trained in this function and have a minimum of two (2) years hands-on experience in performing sewer cleaning including safe working practices, proper cleaning procedures, and experience operating the types of cleaning equipment used for this contract.
- D. No crew members shall enter confined spaces without the necessary certified training and proper permit.

1.07 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.

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

- A. Reference Specification Section 01030 – Special Project Procedures.

PART 2 – PRODUCTS

2.01 GENERAL

- A. The Contractor shall provide all supervision, labor, material, supplies, equipment, transportation, traffic control, etc., necessary to satisfactorily clean the sewer main(s). The Contractor shall be responsible for selecting the type of equipment to perform the work. The selected equipment must meet the requirements described herein and have approval of the Program Manager prior to use.
- B. **Hydraulically Propelled Equipment:** The equipment used shall be of a movable dam type and be constructed so a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. The movable dam shall be equal in diameter to the main being cleaned and shall provide a flexible scraper around the outer periphery to ensure removal of grease. If sewer cleaning balls or other equipment, which cannot be collapsed, are used, special precautions to prevent flooding of the sewers and public or private property shall be taken.
- C. **High-Velocity Jet (Hydrocleaning) Equipment:** All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size mains designated to be cleaned. Specialized nozzles capable of concentrating pressurized water either to the crown or lower quadrant of the pipe to be cleaned shall be available on site. Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floor. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel.
- D. **Mechanically Powered Equipment:** Bucket machines shall be in pairs with sufficient power to perform the work in an efficient manner. Machines shall be belt operated or have an overload device. Machines with direct drive that could cause damage to the main will not be allowed. A power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 500 feet of rod. The rod shall be specifically heat-treated steel. To ensure safe operation, the machine shall be fully enclosed and have an automatic safety clutch or relief valve.
- E. **Large Diameter Cleaning:** For cleaning large diameter sewer, storm or combination pipes, consideration should be given to a combination hydraulic high volume water and solids separation system. The flow from the sewer will provide water for the pump operation so no potable water is necessary and treatment costs are not a factor. Water volume of up to 250 GPM at 2000 psi+ will move solids to the downstream manhole in high flow conditions. The separation system will dewater solids to 95% (passing a paint filter test) and transfer them to a dump truck for transport to a sewage treatment plant or approved landfill. Sewer water will be filtered to a point where it can be used in the pump for continuous cleaning. No bypassing of sewer flows will be necessary. The unit shall be capable of 24 hour operation and the unit shall not leave the manhole until a section is fully cleaned.

The flow of sewage in the sewer mains shall be utilized to provide the necessary pressures for hydraulic cleaning devices whenever possible. When additional quantities of water from fire hydrants are necessary to avoid delay in normal working

procedures, the water shall be conserved and not used unnecessarily. The Contractor's truck/trailer must be permitted by the County as having the proper backflow prevention devices. The approval of the County shall be obtained before County water is used. Hydrants shall only be operated under the supervision of the County. Contractor shall be responsible for obtaining a hydrant meter from the County for this water use as directed by the Program Manager. Contractor shall be responsible for all costs associated with hydrant meter(s).

- F. The Contractor shall be responsible for providing all other necessary hoses and tools for obtaining the water.

PART 3 – EXECUTION

3.01 GENERAL

- A. **Cleaning Precautions:** During cleaning operations, satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools (requiring water pressure to provide their cleaning force) or tools retarding the flow in the sewer main are used, precautions, including the direction of the cleaning operation, shall be taken to ensure the water pressure created does not damage or cause flooding of public or private property being served by the pipe.
 - 1. In the case where damage to the County infrastructure is caused by the Contractor, for any reason, such as would be caused by incorrect deployment of equipment 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 Program Manager within 24 hours.
 - 2. Lodged equipment not associated with Contractor negligence (incorrect deployment, pipe condition, etc.) will be removed by the Contractor at an agreed upon price at the direction of the Program Manager. Payment will be under the appropriate pay item.
 - 3. In the case where damage to the County infrastructure is unable to be determined, the County will share 50% of the cost of retrieval with the Contractor.
- B. **Cleaning:** The designated manhole sections shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. Selection of the equipment used shall be based on the conditions of pipes at the time the work commences. The equipment and methods selected shall be satisfactory to the County. The equipment shall be capable of cleaning a minimum of 1200' linear feet and of removing dirt, grease, rocks, sand, silt, hardened deposits (tuberculation) and all obstructions from the pipes and manholes. If cleaning an entire section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning again attempted. Extreme care shall be taken when cleaning in a reverse setup so as not to cause flooding of service lines located along the sewer. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, it will be assumed a major blockage exists and the cleaning effort shall be repeated with other types of equipment. All pipes shall be cleaned to the satisfaction of the County.
- C. The term "clean", as used herein, shall mean the complete removal of all garbage, dirt, gravel, rocks, roots, grease, settled sludge and all other solid or semi-solid

materials from the pipes and manholes. All line segments receiving CCTV will be cleaned,(light or heavy) as required as part of the assessment process).

- D. Heavy Cleaning (CCTV'd lines only) for $\leq 8"$ to $18"$ Diameter: The term clean, as used herein, shall mean the complete removal of all dirt, grit, gravel, roots, rocks ($\geq 3"$), bricks, grease, settled sludge and hardened deposits (tuberculation). Line segments designated by the Project Manager to be cleaned will be cleaned and will be determined by the DWM Inspector to be classified as "Heavy Cleaning" or not. All the following requirements are to be satisfactorily completed as determined by the DWM Inspector:
4. Cleanings must be captured and removed from line at upstream or downstream manhole associated with the cleaned line segment. The Contractor will not be allowed to pull the cleanings through the downstream manhole into the next pipe segment.
 5. Grease and Roots should have been removed in order to perform CCTV. All remaining roots and grease, not removed in light cleaning associated with the original CCTV effort, shall be removed. Removal of these items are included in the price bid for performing CCTV.
 6. The Contractor shall utilize the proper nozzle for the work being performed.
 7. The Contractor shall maintain a minimum of 1800 psi unless circumstances dictate that this pressure be lowered in which case the Contractor will notify the Inspector and provide reasoning for consideration and approval.
 8. The Contractor has to perform more than five (5) passes to move the sediment from the pipe to the next upstream or downstream manhole.
 9. The Contractor is required to move bricks and large rocks ($\geq 3"$ diameter). Note that brick and rock are plural.

Based on the judgment of the DWM Inspector line segments that require more than five (5) passes to move sediment from the pipe being cleaned to the upstream and/or downstream manhole, but do not have bricks and rocks ($\geq 3"$), may be classified as Heavy Cleaning.

- E. Cleaning for $>18"$ - $36"$ / $>36"$ Diameter Pipe: The term "clean", as used herein, shall mean the complete removal of all garbage, dirt, gravel, rocks, roots, grease, settled sludge and all other solid or semi-solid materials from the pipes and manholes. Line segments designated by the Project Manager to be cleaned will be cleaned, and that cleaning verified with a Post-TISCIT assessment of the cleaned section verifying cleaning level of $>95\%$ level of through cross-sectional area (Section 3.02). Cleaning and Verification will be defined by the percentage of cross-sectional area blockage ($\leq 15\%$, $15\% - 25\%$, and $>25\%$) and by size ($>18"$ - $36"$, and $>36"$).
10. Cleaning & Verification $\leq 15\%$ Average Cross-Sectional Area Blockage, " $>18-36/>36"$ Diameter Pipe:
 - a. This item is defined by a total volume of solids, debris, deposits, etc., in the MH to MH pipe segment less than that for the calculated volume in the pipe segment representing 15% cross sectional area loss for the length of the segment.

2. Cleaning & Verification > 15% - ≤25% Average Cross-Sectional Area Blockage, "(>18-36/>36)" Diameter Pipe
 - a. This item is defined by a total volume of solids, debris, deposits, etc., in the MH to MH pipe segment greater than that for the calculated volume in the pipe segment representing 15% cross sectional area loss for the length of the segment and less than or equal to that for the calculated cross sectional area loss at 25% cross sectional area loss.
 3. Cleaning & Verification > 25% Average Cross-Sectional Area Blockage, "(>18-36/>36)" Diameter Pipe
 - a. This item is defined by a total volume of solids, debris, deposits, etc., in the MH to MH pipe segment greater than that for the calculated volume in the pipe segment representing 25% cross sectional area loss for the length of the segment
- F. Conditions, such as broken mains and major blockages, may prevent cleaning from being accomplished, especially where additional damage would result if cleaning were attempted, or continued. Should such conditions be encountered, the Contractor shall not be responsible to clean those specific main sections unless the County removes the apparent obstruction. The Contractor shall immediately notify the Program Manager and propose alternative cleaning procedures to clear the obstruction.
- G. Whenever mains to be cleaned show evidence of being more than one-half filled with solids, buckets machines and/or rodding machines shall be utilized to remove the major portion of the material before hydraulic equipment or high velocity, hydro-cleaning equipment is brought into use for finishing the cleaning work.
1. When bucket machines are used, the bucketing process shall be done in one main section at a time. A bucket of the proper size shall be placed into the downstream manhole and pulled, in intervals, towards the upstream manhole.
 2. The bucket shall be retrieved and emptied at varying intervals depending upon the amount of materials being removed. When a bucket is retrieved and it is completely full or overflowing with materials, then the length of travel into the main shall be reduced to ensure total removal of debris. This process shall be repeated until the bucket has been pulled through the entire main section. Upon completion of the bucketing or rodding operation, hydraulically propelled cleaning equipment or high velocity hydro-cleaning equipment shall be used to complete the cleaning work.
- H. **Root Removal:** Roots shall be removed from sections designated to be cleaned. Special attention shall be used during the cleaning operation to assure complete removal of roots from the joints. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root saws, chain-slingers, porcupines, and equipment such as high-velocity jet cleaners.
- I. **Material Removal:** All sludge, dirt, sand, rocks, grease, and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream

manhole of the section being cleaned. Passing material from manhole section to manhole section, potentially causing main stoppages, accumulations of sand in wet wells, or damage pumping equipment, shall not be permitted.

- J. **Disposal of Materials:** All solids, semisolids and/or liquids resulting from the cleaning operations shall be removed from the work site and disposed of at a site designated by the County and approved to accept wastewater debris and liquids. All materials shall be removed from the site no less often than at the end of each workday. Under no circumstances will the Contractor be allowed to accumulate debris, etc., on the site of work beyond the stated time, except in totally enclosed containers and as approved by the County. **Under no circumstances shall removed debris and/or liquids be dumped onto the ground or streets or into ditches, catch basins or storm drains for any length of time.** Contractor shall be responsible for legally disposing of all debris and all disposal costs. The County will provide landfill facilities and will reimburse the Contractor for dumping fees when invoiced with supporting information.
- K. **Protruding Tap Removal:** Service taps extending into the pipe shall be removed by means of hydraulically or mechanically operated equipment. Chain cutters, clamshell cutters, and robotic lateral reinstatement cutters are typical equipment used to remove protruding taps. Taps should be removed so the resulting protrusion is less than 1" at the greatest point, or 10% of sewer main diameter, whichever is smaller. All debris resulting from protruding tap removal shall be removed immediately from the pipe. Where protruding taps are vitrified clay, grinding wheels may be used on lateral reinstatement cutters to ensure a smooth finish. Where protruding taps prevent the passage of equipment through the pipe, notify the County immediately for point repair execution. Note: All protruding taps must be verified via television inspection prior to inserting any type of cutting tool into the main.
- L. **Grease Removal:** Grease shall be removed in designated sections where grease is a known problem and shall be considered part of the cleaning procedures. The Contractor shall provide a list of lines requiring grease removal to the County and the Program Manager so they may be added to the County's on-going maintenance list. Special attention should be given during the cleaning operations to ensure the complete removal of grease from the top of the pipe. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutter and porcupines, and equipment such as high-velocity jet cleaners, and hot water. Chemical means of grease removal will be allowed upon request by the Contractor; however, it is considered subsidiary to Line Cleaning, and no additional payment will be allowed.

3.02 ACCEPTANCE

- A. Acceptance of pipe cleaning shall be made upon the successful completion of the television/sonar inspection indicating a minimum of 95% of the through flow channel and cross section. If the inspection shows the cleaning to be unsatisfactory, the

Contractor shall be required to re-clean and re-inspect the pipe until the cleaning is shown to be satisfactory at no additional cost to the County,

3.03 CLEANING PRECAUTIONS

- A. Bucket machines or rodding machines shall be used very carefully because of their tendency to "hang-up" on or "wedge against" the sewer main and break it. Only experienced and well-trained operators shall operate the machines(s).
- B. Whenever hydraulically propelled cleaning tools, or high velocity, hydro-cleaning equipment or any tools retarding the flow of water in the sewer mains are used, precautions shall be taken to ensure the water pressure created does not cause any damage or flooding to public or private property being served by the main involved.
- C. Any damage to the sewer mains caused by the Contractor's operations shall be repaired in a manner approved by the County at the Contractor's expense. The County reserves the right to make said repairs itself and charge the Contractor accordingly.
- D. Damage due to flooding of any public or private property being served by any main over-filled by Contractor's cleaning operations shall also be repaired or otherwise paid for by the Contractor.

3.04 PUBLIC NOTIFICATION – CLEANING

- A. Reference Specification Section 01041 – Project Coordination. Public Notification for Cleaning will be included with the notification for CCTV.

3.05 DOCUMENTATION

- A. The Contractor shall keep records (in a log-type Access Database form) of the work accomplished in the cleaning of the pipes. With each pay request, digital backup documentation is required. The following information shall be required as a minimum:
 - 1. Location (street address) and type of surface cover
 - 2. Upstream Manhole ID Number to Downstream Manhole ID Number
 - 3. Pipe ID Number
 - 4. Date and Time
 - 5. Length of Pipe
 - 6. Condition and depth of manholes
 - 7. Size and type of main
 - 8. Type and condition of manhole
 - 9. Type of cleaning performed and various types of equipment used.
 - 10. Meter readings (fire hydrant use)
 - 11. Remarks as to type of materials removed, amount of materials removed, and number of hours spent on each pipe section
- B. The Contractor shall complete work on each asset as assigned via the Program Manager. Upon start of work, the Contractor shall receive work orders as assigned by

the Program Manager. The Contractor shall maintain and synchronize the status of each work order issued.

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. This specification covers all Work, materials and equipment required for:
 - 1. Mixing and placing concrete.
 - 2. Protection of new work.
 - 3. Curing.
 - 4. Testing and inspecting concrete.
 - 5. Defective concrete.

1.02 RELATED SECTIONS

- A. Section 02700: Pavement Repairs
- B. Section 02710: Concrete Curb, Gutter, Sidewalk, and Driveway Repairs

1.03 REFERENCES

- A. ASTM C33 – “Standard Specification for Concrete Aggregates”
- B. ASTM C494 – “Standard Specification for Chemical Admixtures for Concrete”

1.04 SUBMITTALS

- A. Mix Designs: to contain portions of materials and admixtures to be used on Project, signed by mix designer, documentation of average strength for each proposed mix design and Manufacturer’s Certificate of Compliance.
- B. Test Reports for aggregates used in the mix design
- C. Admixtures: manufacturer’s catalog cut sheets and product data sheets for each admixture used in proposed mix design
- D. Product Data: Specified ancillary materials.
- E. Detailed plan for curing and protection of concrete placed and cured in cold weather. Details shall include, but not be limited to, the following:
 - 1. Procedures for protecting subgrade from frost and accumulation of ice or snow on reinforcement, other metallic embeds, and forms prior to placement.
 - 2. Procedures for measuring and recording temperatures of reinforcement and other embedded items prior to concrete placement.
 - 3. Methods for temperature protection during placement.
 - 4. Types of covering, insulation, housing, or heating to be provided.
 - 5. Curing methods to be used during and following protection period.

6. Use of strength accelerating admixtures.
 7. Methods for verification of in-place strength.
 8. Procedures for measuring and recording concrete temperatures.
 9. Procedures for preventing drying during dry, windy conditions.
- F. Detailed plan for hot weather placements including curing and protection for concrete placed in ambient temperatures over 80 degrees F. Plan shall include, but not be limited to, the following:
1. Procedures for measuring and recording temperatures of reinforcement and other embedded items prior to concrete placement.
 2. Use of retarding admixture.
 3. Methods for controlling temperature of reinforcement and other embedded items and concrete materials before and during placement.
 4. Types of shading and wind protection to be provided.
 5. Curing methods, including use of evaporation retardant.
 6. Procedures for measuring and recording concrete temperatures.
 7. Procedures for preventing drying during dry, windy conditions
- G. Manufacturer's Certificate of Compliance to specified standards
- H. Statement of Qualification:
1. Batch Plant: Certification as specified herein.
 2. Mix designer.
 3. Installer.
 4. Testing agency.
- I. Field test reports

PART 2 - PRODUCTS

2.01 MATERIAL

- A. Portland Cement: Conform to ASTM "Standard Specifications for Portland Cement", C150, Type I/II. Use one brand of cement. Mix shall contain at least 520 lb. of Portland Cement per cubic yard of concrete.
- B. Aggregates: Conform to ASTM "Standard Specifications for Portland Cement", C33. Provide aggregate of natural sand and gravel or prepared from stone or gravel, free from adherent coatings, maximum size of pieces 1". Use pea gravel aggregate for concrete mix used in filling voids in concrete block walls where required.
- C. Water: Clean and free from injurious amounts of oils, acids, alkalis, organic materials, and deleterious substances. Non-potable water will not be used in concrete mixing.
- D. Admixtures: Conform to ASTM C494 "Standard Specification for Chemical Admixtures for Concrete"

2.02 CONCRETE STRENGTHS

- A. Cast-in-place Concrete: Designed to develop 3,000 psi minimum compressive strength at twenty-eight (28) days and 3,500 IF EXPOSED TO WEATHER, unless noted otherwise.
- B. Cast-in-place pavement uses will need to develop 4000 psi minimum compressive strength at twenty-eight (28) days.

PART 3 - EXECUTION

3.01 PREPARATION AND INSTALLATION

- A. Notify Program Manager at least 1 full working day in advance before starting to place concrete
- B. Clean equipment for transporting concrete. Remove debris, water, and ice from places to be occupied by concrete. Remove laitance and unsound material from hardened concrete before additional concrete is added.
- C. No concrete shall be placed when mixed longer than ninety (90) minutes, has exceeded three hundred (300) truck drum revolutions, or evidence of curing prior to placement.
- D. Concrete, when deposited, shall have a temperature ranging between a minimum of 50° F and a maximum of 90° F.
- E. Falling concrete shall be closely confined in a drop chute of the proper size when drop is over four (4) feet, and the final drop must be vertical to avoid segregation of aggregates. In no case shall concrete be deposited from a height causing separation of the aggregates.
- F. Pumping of Concrete
 - 1. Provide standby pump, conveyor system, crane and concrete bucket, or other system onsite during pumping, for adequate redundancy to ensure completion of concrete placement without cold joints in case of primary placing equipment breakdown.
 - 2. Minimum pump hose diameter: 4 inches
 - 3. Replace pumping equipment and hoses that are not functioning properly.
- G. Concrete shall be mixed in such quantities as required for immediate use and shall be placed while fresh before loss of slump occurs. Re-tempering by adding water to restore slump lost during excessive mixing or due to too long a lapse of time since initial mixing will not be permitted.
- H. Concrete shall be rodded or vibrated to remove excess voids and air pockets when applicable.

3.02 POST INSTALLATION

- A. All freshly placed concrete shall be adequately protected from mechanical injury or by action of the elements until such time as the concrete is thoroughly set.
- B. Curing
 - 1. Curing shall be performed on all concrete surfaces not immediately back-filled when hard.

2. Curing shall be started immediately upon completion of the finishing operation. Curing shall continue uninterrupted for a minimum period of seven (7) days unless a longer period is hereinafter specified. Rapid drying upon completion of the curing period shall be prevented. At no time during the curing period shall the temperature of the concrete be permitted to drop below 40° F.
3. Curing may be by water curing, sheet or liquid membrane. Do not use liquid membrane where a later concrete or masonry joint may occur unless the material has been certified as a non-bond breaker.

3.03 TESTING

- A. Four (4) test cylinders shall be molded each day for each fifty (50) cubic yards or fraction thereof. A slump and air test shall be made for each set of cylinders and whenever the concrete appears to vary in consistency.
- B. Mold and cure test cylinders in accordance with ASTM C-31 or PTM 611.
 1. Test one (1) cylinder at seven (7) days. If break does not meet specification, break two (2) cylinders at twenty-eight (28) days for acceptance.
 2. The remaining cylinder shall be kept for reference or additional testing if required.
- C. Slump
 1. Prior to submitting mix design, consult with concrete producer and select a target slump value at point of delivery, for each application of each design mix. Unless otherwise permitted, target slump value will then be enforced for duration of project. Unless otherwise permitted, target slump value is 4 inches at point of delivery, for concrete without high-range, water-reducing admixture.
- D. Source Quality Control Inspection: Owner shall have access to and have the right to inspect batch plants, cement mills, and supply facilities of suppliers, manufacturers, and Subcontractors, providing products included in this section.

3.04 ACCEPTANCE

- A. Defective concrete is defined as concrete in place not conforming to strength, shapes, alignments and/or elevations as specified or shown on the Drawings.
- B. All defective concrete shall be removed and replaced in a manner meeting specifications at no additional cost to the Owner.

END OF SECTION