#### ADVERTISEMENT FOR BIDS

# City of Grayson Grayfield Subdivision Storm System Project

Sealed bids will be received by the City of Grayson until **2:00 P.M., Thursday, November 30, 2023** at Grayson City Hall, 475 Grayson Parkway, PO Box 208 Grayson, GA 30017, for furnishing all materials, labor, tools, equipment, and any other miscellaneous items necessary for the Grayfield Subdivision Storm System Project. Bids shall be marked and labeled as **Grayfield Subdivision Storm System Project**. Any bid received after said time and date of bid opening will not be considered by OWNER. Bids will be publicly opened and read aloud at this time and location. All bids will be evaluated by OWNER, and the project will be awarded, if it is awarded, within sixty (60) days of the bid opening.

#### The Project consists of, but is not limited to the following major elements:

Cleaning and repairing of storm pipes, structures, and appurtenances located within Grayfield Subdivision in the City of Grayson, Georgia. Grayfield's storm pipe system consists of approximately 19 manholes (catch basins), 18 headwalls, and 2,100 linear feet corrugated metal pipe with diameters ranging from 18 to 66 inches. All of the manholes need cleaning and sealing at joints. A couple of headwalls are separating from the pipes, and need to be reattached. All headwalls need clearing around them and rip rap outlet protection installed. Most of the pipes have the bottom full of silt, debris, and rip rap. Several of the pipes have rusted bottoms. The approach that the City is taking is to have the pipes cleared of debris, hydro jet cleaned; joints sealed, rusted bottoms repaired, and where needed pipes spray lined with either a geopolymer or polyurea system. The work also includes restoring/repairing the detention pond dam. See "Grayfield Subdivision Storm Pipe Maintenance & Repair" for specific detail and mapping of each stormwater run. Videos of each run from TV Testing & Rerounding, LLC will also be available upon request.

A pre-bid conference is not scheduled for this project. Potential bidders may obtain access to videos of the storm sewer interior by email request to Natalie Pifer at <u>861np@ppi.us</u>.

Time of completion for all work associated with this project shall be SIXTY (60) consecutive calendar days from the date of a written "Notice to Proceed" from OWNER.

Questions regarding this request for bids should be emailed directly to Natalie Pifer, Precision Planning, Inc. at <u>861np@ppi.us</u> no later than 2:00 P.M. Thursday, November 22, 2023.

A bid bond is not required for this project.

The successful bidder will be required to furnish OWNER with Insurance, Workman's Compensation Insurance, and Performance and Payment Bonds in the amount of one-hundred percent (100%) of the total bid.

OWNER reserves the right to reject any bid based on evaluations and investigations of bidder's quality, workmanship, or adherence to schedule on previous projects. The contract shall be awarded based on the best interest of the OWNER, as determined by the OWNER.

Allison Wilkerson, Mayor City of Grayson



# **REQUEST FOR BIDS**

**CITY OF GRAYSON** 

GRAYFIELD SUBDIVISION STORM SYSTEM PROJECT

**NOVEMBER 1, 2023** 

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#### **INSTRUCTIONS TO BIDDERS**

#### 1 <u>DEFINED TERMS:</u>

1.1 The term "Successful Bidder" means the Bidder to whom the OWNER awards or expects to award the contract.

#### 2 COPIES OF BID DOCUMENTS:

- 2.1 The Bid Document Package consists of the following items:
  - a. This REQUEST FOR BIDS, dated November 2023, that includes all forms, attachments and Technical Specifications as cited in the REQUEST FOR BIDS.
  - b. All Addendums to the REQUEST FOR BIDS issued by the City of Grayson in accordance with item 5 below.
- 2.2 Complete sets of Bid Documents shall be used in preparing Bids. The OWNER assumes no responsibility for errors or misinterpretations resulting from using incomplete sets of Bid Documents.
- 2.3 The OWNER, in making Bid Documents available on the above terms, does so only to obtain Bids on Work and does not confer license or grant for any other use.
- 2.4 Any part of the Bid Documents may be modified by Addenda.

# 2.5 Where forms are provided, THEY MUST BE USED WITHOUT SUBSTITUTION! Use of forms other than those provided by the City of Grayson shall constitute a non-responsive Bid and shall be rejected.

NOTE: Bidder should submit one original of Bid Documents to include: Bid Form; Instructions to Bidders, Statement of Qualifications, Bidder's Affidavit, and Non-Collusion Affidavit.

#### 3 <u>PRE-BID MEETING:</u>

A pre-bid meeting will not be held for this project.

#### 4 EXAMINATION OF BID DOCUMENTS AND SITE:

- 4.1 Before submitting Bid, each Bidder shall: (a) examine the Bid Document Package thoroughly; (b) become familiar with local conditions affecting cost or Work progress or performance; (c) become familiar with federal, state, and local laws, ordinances, rules, and regulations affecting cost or Work progress or performance; (d) study and carefully correlate Bidder's observations with the Bid Document Package; and, (e) notify the Engineer concerning conflicts, errors, or discrepancies in Bid Document Package.
- 4.2 The Bid Documents summarize the surface and underground structures likely to affect the prosecution of the Work insofar as they have been determined, but the information

indicated is not guaranteed as being correct and complete. Bidders are expected to examine the Bid Documents and the location of the Work, verify all information with authorities concerned, and judge for themselves all the circumstances affecting the cost of the Work and the time required for its completion, and shall assume all patent and latent risks in connection therewith.

- 4.3 Potential bidders may obtain access to videos of the storm sewer interior by email request to Natalie Pifer at <u>861np@ppi.us</u>.
- 4.4 Land where Work is to be performed, rights-of-way for access to site, and other lands designated for use by CONTRACTOR in performing Work are identified in General Conditions and Plans. The CONTRACTOR's operations must be confined inside such property, rights-of-way or easement lines as provided by the City.

# The CONTRACTOR shall not enter any private property outside of drainage easements except upon written direction from the PROPERTY OWNER.

4.5 Bid submission will constitute **incontrovertible** representation that Bidder understands and has complied with requirements contained in this Article 4, and that Bidder has read and understood the Bid Document Package and hereby stipulates that the documents are sufficient in scope and detail to indicate and convey understanding for terms and conditions in order to perform Work.

#### 5 ADDENDA AND INTERPRETATIONS:

- 5.1 All questions shall be directed to Natalie Pifer of Precision Planning Inc., via phone at 770-267-8800, facsimile at 770-207-1564, or e-mail at 861np@ppi.us. All responses to written requests for clarification, interpretation, or additional information will be distributed as addenda to this Request for Bids. Questions received after 2:00 P.M. local time on Thursday, November 22, 2023 time will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 5.2 Addenda may be issued to modify Bid Document Package as deemed necessary by the City of Grayson.

#### 6 <u>CONTRACT TIME:</u>

The Work shall be completed within sixty (60) calendar days.

#### 7 <u>BID FORM</u>:

- 7.1 Bid Form is included in the Bid Document package provided to each Bidder.
- 7.2 Bid Forms shall be completed and submitted in duplicate.

#### 8 QUANTITIES OF WORK:

The quantities of Work as given for Unit Price Items in the Bid Form are approximate and are assumed solely for comparison of the bids. They are not guaranteed to be accurate statements or estimates of quantities of Work that are to be performed under the contract, and any departure therefrom will not be accepted as valid grounds for any claim for damages, for extension of time or for loss of profits; nor will any additional payments other than that bid or stipulated under the Unit Prices, be made regardless of the actual quantities required or ordered to complete the Work.

#### 9 <u>SUBMISSION OF BIDS</u>:

- 9.1 Bids shall be submitted by no later than 2:00 P.M. local time on November 30, 2023 at Grayson City Hall, 475 Grayson Parkway, PO Box 208, Grayson, GA 30017 and shall be submitted in a sealed envelope with notation "PROJECT NAME, NAME OF BIDDER, DATE AND TIME OF OPENING " on face. If Bid is sent through mail or other delivery system, sealed envelope shall be enclosed in separate envelope with same notations as above on face.
- 9.2 Each Bid shall contain one original of the following documents in completed form (City forms must be used without substitution):
  - a. BID FORM
  - b. BIDDER'S AFFIDAVIT
  - c. NON-COLLUSION AFFIDAVIT
  - d. Corporate authority to execute Bid (required for any corporate officer other than president or vice-president)
- 9.3 More than one Bid received for same work from individual, firm, partnership, corporation, or association under same or different names will not be considered. Reasonable grounds for believing any Bidder is interested in more than one Bid for same work will cause OWNER to reject all Bids from Bidder. If OWNER believes collusion exists among Bidders, Bids from participants in collusion will not be considered.
- 9.4 Conditions, limitations, or provisions attached by the Bidder to the Bid Forms may cause its rejection. Bids containing Items not included in the form of Bid will be considered irregular.

#### 10 MODIFICATION AND WITHDRAWAL OF BIDS:

10.1 Withdrawal Prior to Time for Receiving Bids - Bids may be modified or withdrawn by appropriate document duly executed (in manner Bid must be executed) and delivered to place where Bids are to be submitted at any time prior to deadline for submitting Bids. Bid Withdrawal will not prejudice Bidder's rights to submit new Bid prior to Bid Date and Time.

10.2 Withdrawal After Time for Receiving Bids - After period for receiving Bids has expired, no Bid may be withdrawn, modified, or explained except as provided for in paragraph 12 below.

#### 11 OPENING OF BIDS:

Bids will be opened publicly at the time and place set forth in the ADVERTISEMENT FOR BID and read aloud.

#### 12 BIDS TO REMAIN OPEN:

Bids shall remain open for acceptance by OWNER for sixty (60) calendar days after Bid opening. OWNER may, at its sole discretion, release any Bid prior to that date.

#### 13 AWARD OF PRICE AGREEMENT/CONTRACT:

- 13.1 To extent permitted by applicable state and federal laws and regulations, OWNER reserves right to reject any and all Bids, to waive any and all informalities, and to disregard nonconforming, non-responsive, or conditional Bids. Bids may be considered irregular and subject to rejection if they show serious omission, unauthorized form alterations, use of unauthorized forms, unauthorized alternate bids, incomplete or unbalanced unit prices, or other irregularities. Discrepancies between words and figures will be resolved in favor of correct sum. Any mistake which is obviously a clerical one, such as an error in price extension, or in placement of decimal points, reversal of prices, FOB destination, FOB point of origin, etc., may be corrected by the City of Grayson after verification is made by the bidder. However, under no circumstances can unit prices be changed.
- 13.2 Contract will be awarded by OWNER pursuant to applicable law. Nothing contained herein shall place duty upon OWNER to reject bids or award bid based upon anything other than OWNER's sole discretion as described herein.
- 13.3 The City of Grayson may consider qualifications and experience for subcontractors, suppliers, persons, and organizations proposed for Work.
- 13.4 The City of Grayson may conduct investigations deemed necessary to assist in evaluating Bids and to establish responsibility, qualifications, and financial ability for Bidders, proposed Subcontractors, persons, and organizations to do Work. The OWNER reserves the right to reject Bid from any Bidder not passing evaluation.
- 13.5 The City of Grayson will award the project based on the best interest of the OWNER. Successful Bidder will be required to perform Work as Prime CONTRACTOR. CONTRACTOR shall submit a list of subcontractors to be used to complete the project.

#### 14 <u>REQUIRED PROJECT BONDS</u>:

14.1 Successful bidder shall provide PERFORMANCE BOND (See Attached).

- 14.2 Successful bidder shall provide LABOR & MATERIAL PAYMENT BOND (See Attached).
- 15 <u>PROJECT SCOPE</u>: The project involves the rehabilitation and maintenance of the stormwater system in the Grayfield Subdivision within the Grayson city limits. The Contractor shall provide all labor, equipment, materials and any other miscellaneous items necessary for the project in accordance with the Scope of Work. Please refer to Appendix B the specific work areas.
  - 1. <u>Scope of Work:</u> Work includes the cleaning and repairing of storm pipes, structures, and appurtenances located within Grayfield Subdivision in the City of Grayson, Georgia. Grayfield Subdivision was developed in the mid-1980s, and several of the storm pipes carry live streams. In 2018, the corrugated metal outlet pipe for the subdivision detention pond gave way due to a rusted-out invert. Since this time, a couple of sinkholes have formed around a couple of the storm pipe runs. These factors have prompted the City of Grayson to have the system thoroughly inspected via closed circuit televising. TV Testing & Rerounding, LLC performed this inspection for the City earlier this year, and the results of this televising have shown the overall storm pipe system to be in a decent repairable state without large amount of replacement, other than the detention pond outlet pipe.

Grayfield's storm pipe system consists of approximately 19 manholes (catch basins), 18 headwalls, and 2,100 linear feet pipe with diameters ranging from 18 to 66 inches. All of the manholes are in good shape, and need cleaning and sealing at joints. Most headwalls are in good shape, although a couple are separating from the pipes. All headwalls need clearing around them and rip rap outlet protection installed. All of the pipes are corrugated metal, and are in alignment and not deformed. Most of the pipes have the bottom full of silt, debris, and rip rap. Several of the pipes have rusted bottoms. The approach that the City is taking is to have the pipes cleared of debris, hydro jet cleaned; joints sealed, rusted bottoms repaired, and where needed pipes spray lined with either a geopolymer or polyurea system. The work also includes restoring/repairing the detention pond dam. See "Grayfield Subdivision Storm Pipe Maintenance & Repair" for specific detail and mapping of each stormwater run. Videos of each run from TV Testing & Rerounding, LLC will also be available upon request.

 <u>Traffic Control</u>: The Contractor shall be responsible for all traffic control activities required during the performance of the Work. The Contractor shall submit a work sequence schedule to the City of Grayson for review and approval no less than two weeks prior to beginning construction. The Contractor's fee shall include notification signage or portable traffic message boards to be placed on each approach to the job site informing motorists of any approved road closure at least seven days in advance. Contractor shall provide all necessary traffic control devices, signage, and barricades as required by MUTCD standards. <u>No full closure of subdivision will be permitted.</u>

The City prefers that any partial closure of roads within the subdivision be limited to one lane closure for not more than two days and the work conducted on weekdays from 8 am-5 pm, if possible. The road is the only means of ingress/egress for the residences in the Grayfield subdivision.

3. The Contractor shall coordinate with local utility agencies to ensure protection of all utilities in the project area.

- 4. The Contractor shall provide and maintain equipment needed to bypass creek flows away from the project area, as needed, during the performance of the work.
- 5. Contractor shall provide erosion and sediment control throughout the duration of the project in accordance with GSWCC BMP's.
- 6. Contractor shall limit clearing of vegetation in the project area to only those areas needed for access of equipment and materials and installation activities.
- 7. Contractor shall thoroughly clean the existing work area of all dirt and debris and dispose of all waste materials off-site at a facility permitted to accept such materials.
- 8. <u>Project Management/Inspections</u>: Project management and inspection will be provided by the City of Grayson and/or Precision Planning, Inc.
- 9. **<u>Schedule</u>**: All work shall be completed in sixty (60) days.
- 10. <u>Safety</u>: Contractor shall be responsible for jobsite safety, and the safety of the traveling and general public within the work zone.
- 11. <u>Access</u>: Contractor shall be responsible for coordinating access to private property during the execution of the work.

#### 12. Measurement and Payment:

<u>Creek Bypass and Flow Management</u>: The basis of payment for this item shall be lump sum to include all labor, materials, fuel, equipment and other miscellaneous costs associated with the installation and operation of facilities needed to divert flows in the creek away or through from the project area during the duration of the Work, including sediment and erosion control.

<u>Cleaning Existing Storm Pipe</u>: The basis of payment for this item shall be lump sum to include all labor, materials, fuel, equipment and other miscellaneous costs associated with cleaning the existing storm piping and the removal and disposal of waste materials.

<u>Pipe Installation and Lining</u>: The basis of payment for this item shall be per linear foot of new piping and spray lining installed and shall include all labor, equipment and materials required for the installation of the new piping, including grouting of the annular space and grouting of the storm structures.

<u>Channel Stabilization</u>: The basis of payment for this item shall be per horizontal square yard of riprap placed to include all labor, equipment and materials required for the installation of all required riprap.

<u>Traffic Control</u>: The basis of payment for this item shall be lump sum to include all labor, equipment and materials associated with traffic control activities.

No separate measurement or payment will be made for site preparation, earthwork, erosion and sediment control, coordination with property owners, protection of existing utilities and site restoration. Payment for these items shall be included in the unit price bid per linear foot of pipe installed.

#### APPENDIX A

#### **BID DOCUMENT FORMS AND INSTRUCTIONS**

- Bid Pricing Schedule
- Bidder's Affidavit
- Form of Non-Collusion Affidavit
- Statement of Qualifications
- Contractor's Affidavit (E-Verify)
- Performance Bond
- Labor and Material Payment Bond

#### **Bid Pricing Schedule**

Item #	Item Description	Unit	Est. Qty.	Unit Price	Total Price
1	Run #1	LS	1	\$	\$
2	Run #2	LS	1	\$	\$
3	Run #3	LS	1	\$	\$
4	Run #4	LS	1	\$	\$
5	Run #5	LS	1	\$	\$
6	Run #6	LS	1	\$	\$
7	Run #7	LS	1	\$	\$
8	Run #8	LS	1	\$	\$
9	Run #9	LS	1	\$	\$
10	Run #10	LS	1	\$	\$
11	Run #11	LS	1	\$	\$
12	Run #12	LS	1	\$	\$
Alternate 1	Run #12 w/ 54" RCP	LS	1	\$	\$

#### \*\*Reference Appendix B for Run Information

\*\*Do not include Alternate 1 amount in bid total

#### BID TOTAL, ITEMS 1 THRU 12, THE AMOUNT OF:

OF

Person to contact regarding this proposal:

Name/Title

Address

Authorized Signature

By signing and submitting a proposal, your firm acknowledges and agrees that it has read and understands the RFP documents and agrees to the Agreement Terms and Conditions as contained herein.

Phone

Date

Email

#### **Bidder's Affidavit**

(This Bidder's Affidavit is part of the Bid Documents)

BID DATE: Thursday, November 30, 2023

PROJECT NAME: GRAYFIELD SUBDIVISION STORM SYSTEM PROJECT

STATE OF GEORGIA

CITY OF GRAYSON

(Name Printed)

being duly sworn, deposes and says that he resides at \_\_\_\_\_

that he is the

(Title)

(Name of Bidder)

who signed the above Bid Form, that he was duly authorized to sign and that the Bid is the true offer of the Bidder, that the seal attached is the seal of the Bidder and that all the declarations and statements contained in the Bid are true to the best of his knowledge and belief.

(Affiant)

Subscribed and Sworn to before me this \_\_\_\_\_ Day of \_\_\_\_\_ 20\_\_\_

(Notary Public)

My Commission expires \_\_\_\_\_, 20\_\_\_\_

(SEAL)

#### FORM OF NON-COLLUSION AFFIDAVIT

(This Non-Collusion Affidavit is Part of the Bid Documents)

BID DATE: Thursday, November 30, 2023

PROJECT NAME: GRAYFIELD SUBDIVISION STORM SYSTEM PROJECT

STATE OF GEORGIA

CITY OF GRAYSON

being first duly sworn, deposes and says that he is

(sole owner, partner, president, secretary, etc.)

the party making the forgoing Proposal or Bid; that such Bid is genuine and not collusive or sham; that said Bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with any Bidder or person, to put in a sham Bid, or that such other person shall refrain from bidding, and has not in any manner, directly or indirectly sought by agreement or collusion, or communication or conference, with any person, to fix the Bid Price of affiant or any other Bidder, or to fix any overhead, profit or cost element of said Bid Price, or of that of any other Bidder, or to secure any advantage against the City of Grayson, or any other person interested in the proposed Contract; and all statements in said Proposal or Bid are true; and further, that such Bidder has not, directly or indirectly submitted this Bid, or the contents thereof, or divulged information or data relative thereto to any association or to any member or agent thereof.

## **Statement of Qualifications**

. 0	Company Name:		
Ŷ	ears in Business:	Contractor's License No:	
C	Contact Person:	Title:	
P	Phone:	Fax:	
E	-mail Address:		
. L a	ist 5 recent projects of sim	ilar complexity completed in the last two years, including owner, co ce/contact/phone number:	ontract
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V	<i>I</i>		

#### Statement of Qualifications (cont.)

3. List Equipment/Man Power available to complete the work: \_\_\_\_\_\_ 4. List any Sub-contractors that may be utilized on this project and the specific tasks to be performed: \_ 5. List any other relevant data or information that would be beneficial to the City of Grayson in the evaluation of this bid:

#### Contractor Affidavit under O.C.G.A. § 13-10-91(b)(1) (E-VERIFY)

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services on behalf of the CITY OF GRAYSON has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Contractor

Name of Project <u>City of Grayson, Georgia</u> Name of Public Employer

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

Executed on \_\_\_\_\_, \_\_\_, 20\_\_\_ in \_\_\_\_\_(city), \_\_\_\_\_(state).

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME

ON THIS THE \_\_\_\_\_ DAY OF \_\_\_\_\_,20\_\_\_.

NOTARY PUBLIC

My Commission Expires:

#### PERFORMANCE BOND

#### KNOW ALL MEN BY THESE PRESENTS that

	(Name & Address of Contractor) in the State of	, hereinafter called the "Principal",
and		

(Name/Address of Surety), hereinafter called the "Surety", are held and firmly bound unto the City of Grayson, Georgia, hereinafter called the "OWNER", in the total aggregate penal sum of

DOLLARS

(\$\_\_\_\_\_\_) in lawful money of the United States, for the payment of which sum in lawful money of the United States well and truly to be made, we do hereby bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally firmly by these presents.

The condition of this obligation is such that whereas Principal has entered into a certain Contract with OWNER, dated as of the \_\_\_\_\_ day of \_\_\_\_\_, 2023, a copy of which is hereto attached and made a part hereof for the construction of "Grayfield Subdivision Storm System Project".

NOW, THEREFORE, if the Principal shall in all respects comply with and perform all the terms and conditions of the Contract (which includes the Drawings, Specifications, and Contract Documents) and such alternations as may be made in said Contract as the documents therein provide for, during the original term thereof and any extensions thereof which may be granted by OWNER with or without notice to Surety, and during the one (1) year warranty period, and if Principal shall satisfy all claims and demands and shall indemnify and save harmless the OWNER against and from all costs, expenses, damages, injury, or conduct, want of care, skill, negligence or default, including compliance with performance guarantees and patent infringements by the Principal, then this obligation shall be void; otherwise, Principal and Surety jointly and severally agree to pay to OWNER any difference between the sum to which the Principal would be entitled on completion of the Contract and that which OWNER may be obliged to pay for the completion of the WORK by contract or otherwise, together with any damages, direct or indirect, or consequential, which OWNER may sustain on account of such work, or on account of the failure of the Principal to keep and execute all provisions of the Contract.

Principal and Surety further bind themselves, their heirs, executors, administrators, and assigns, jointly and severally, that if the Principal shall keep and perform its agreement to repair or replace defective work or equipment during the warranty period of one (1) year as provided, then this paragraph shall be void; but if default shall be made by Principal in the performance of its contract to so repair or replace said work, then this paragraph shall be in effect and OWNER shall have and recover from Principal and its Surety, damages for all defective conditions arising by reason of defective materials, work, or labor performed by or on the account of Principal and it is further understood and agreed that this obligation shall be a continuing one against the Principal and Surety hereon, and the successive recoveries may be had hereon for successive breaches until the full amount shall have been exhausted; and it is further understood that the obligation therein to maintain said Work shall continue throughout said maintenance period, and the same shall not be changed, diminished or in any manner affected from any cause during said time; and to fully save and hold OWNER harmless for any damages it may be caused to pay on account of injury to person, loss of life or damage to property.

And the Surety, for value received, hereby stipulates and agrees that the obligations of the Surety and this Bond shall in no way, be impaired or affected by any extension of time, modification, omission, addition, or change in or to the Contract, the WORK to be performed thereunder, or by any payment thereunder, before the time required therein, or by any waiver of any provision thereof, or by any assignment subletting or other transfer thereof, or of any part thereof, of any work to be performed, or of any moneys due to become due thereunder; and the said Surety does hereby waive notice of any and all such extensions, modifications, omissions, additions, changes, payments, waivers, assignments, subcontracts, and transfers, and hereby stipulates and agrees that executors, administrators, successors, assignees, subcontractors, and other transferee shall have the same effect as to said Surety as though done or omitted to be done by and in relation to the Principal.

It is expressly agreed that the Bond shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the Principal and the Surety to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this Bond, and whether referring to the Bond, or the Contract shall include any alteration, addition, extension, or modification of any character whatsoever.

No final settlement between the OWNER and the Principal shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, the Principal and Surety have executed this Bond by causing their respective names to be hereunto subscribed and their seals to be hereunto affixed by their duly authorized officers, on this the \_\_\_\_\_ day of \_\_\_\_\_, 2023.

Contractor (	Principal)
BY:	
NAME:	
	(Please Print or Type)
TITLE:	
	(SEAL)
ATTEST:	
NAME:	
TITLE:	

\*NOTE: Date of Bond must not be prior to date of Contract. Attest for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a Notary.

LOCAL SURETY AGENT	SURETY
NAME:	BY:
ADDRESS:	NAME: (Please Print or Type)
	TITLE:
PHONE NO:	(SEAL)
	WITNESS:
	NAME:
	TITLE:

NOTE: Surety companies executing Bonds must appear on the Treasury Dept. most current list (Circular 570, as amended) and be authorized to transact business in the state where the project is located.

#### LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that \_\_\_\_\_

\_\_\_\_\_ (Name and Address of Contractor) in the State of \_\_\_\_\_ and \_\_\_\_\_\_

(Name and Address or Legal Title of Surety), hereinafter called the "Surety", are held and firmly bound unto the City of Grayson, P.O. Box 208, Grayson, GA 30017, hereinafter called the "OWNER", and unto all persons, firms, and corporations who or which may furnish labor, or who furnish materials to perform as described under the contract and to their successors and assigns in the total aggregate penal sum of \_\_\_\_\_\_

(\$\_\_\_\_\_\_), in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, or heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated \_\_\_\_\_\_, 2023, entered into a contract with OWNER for "Grayfield Subdivision Storm System Project", Grayson, Georgia which consists of:

#### The Project consists of, but is not limited to the following major elements:

Cleaning and repairing of storm pipes, structures, and appurtenances located within Grayfield Subdivision in the City of Grayson, Georgia. Grayfield's storm pipe system consists of approximately 19 manholes (catch basins), 18 headwalls, and 2,100 linear feet corrugated metal pipe with diameters ranging from 18 to 66 inches. All of the manholes need cleaning and sealing at joints. A couple of headwalls are separating from the pipes, and need to be reattached. All headwalls need clearing around them and rip rap outlet protection installed. Most of the pipes have the bottom full of silt, debris, and rip rap. Several of the pipes have rusted bottoms. The approach that the City is taking is to have the pipes cleared of debris, hydro jet cleaned; joints sealed, rusted bottoms repaired, and where needed pipes spray lined with either a geopolymer or polyurea system. The work also includes restoring/repairing the detention pond dam. See "Grayfield Subdivision Storm Pipe Maintenance & Repair" for specific detail and mapping of each stormwater run. Videos of each run from TV Testing & Rerounding, LLC will also be available upon request.

The work shall be in accordance with the Request for Bids and Specifications prepared by <u>Precision</u> <u>Planning, Inc., 400 Pike Blvd., Lawrenceville, Georgia 30046</u>, which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. A "Claimant" shall be defined herein as any subcontractor, person, party, partnership, corporation or other entity furnishing labor, services or materials used, or reasonably required for use, in the performance of the Construction Contract, without regard to whether such labor, services or materials were sold, leased or rented, and without regard to whether such Claimant is or is not in privity of contract with the Principal or any subcontractor performing work on the Project, including, but not limited to, the following labor, services, or materials: water, gas,

DOLLARS

power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Construction Contract.

- 2. The above named Principal and Surety hereby jointly and severally agree with the OWNER that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The OWNER shall not be liable for the payment of any costs or expenses of any such suit.
- 3. No suit or action shall be commenced hereunder by any claimant:
  - a. Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: the Principal, the OWNER, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, OWNER or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.
  - b. After the expiration of one (1) year following the date on which Principal ceased WORK on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.
  - c. Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the Project, or any part thereof, is situated, or in the United States District Court for the district in which the Project, or any part thereof, is situated, and not elsewhere.
- 4. In the event a Claimant files a lien against the property of the OWNER, and the Principal falls or refuses to satisfy or remove it promptly, the Surety shall satisfy or remove the lien promptly upon written notice from the OWNER, either by bond or as otherwise provided in the Construction Contract.
- 5. The Surety hereby waives notice of any and all modifications, omissions, additions, changes, alterations, extensions of time, changes in payment terms, and any other amendments in or about the Construction Contract and agrees that the obligations undertaken by this Bond shall not be impaired in any manner by reason of any such modifications, omissions, additions, changes, alterations, extensions of time, changes in payment terms, and amendments.

- 6. The Surety hereby agrees that this Bond shall be deemed amended automatically and immediately, without formal or separate amendments hereto, upon any amendment or modification to the Construction Contract, so as to bind the Principal and Surety, jointly and severally, to the full payment of any Claimant under the Construction Contract, as amended or modified, provided only that the surety shall not be liable for more than the penal sum of the bond, as specified in the first paragraph hereof.
- 7. This Bond is made for the use and benefit of all persons, firms, and corporations who or which may furnish any materials or perform any labor for or on account of the construction to be performed or supplied under the Construction Contract, and any amendments thereto, and they and each of them may sue hereon.

Signed and sealed this	day of	, 2023.	
		PRINCIPAL:	
		TITLE:	
		(WITNESS)	(SEAL)
LOCAL SURETY AGENT:		SURETY:	
NAME:		TITLE:	
ADDRESS:			
		(WITNESS)	(SEAL)
PHONE NO.:			

NOTE: Surety companies executing Bonds must appear on the Treasury Department most current list (Circular 570, as amended) and be authorized to transact business in the state where the project is located.

\*NOTE: Date of Bond must not be prior to date of Contract. Attest for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a Notary.

#### APPENDIX B

#### **GRAYFIELD SUBDIVISION STORM SYSTEM PROJECT**

Evaluation of 12 individual Stormwater runs based on field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 - 08/01/23 and CCTV by TV Testing & Rerounding, LLC on 07/31/23 - 08/01/23.



# **STORMWATER RUN #1 REPORT**

Observations:

Field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 – 08/01/23. CCTV by TV Testing & Rerounding, LLC on 07/31/23 – 08/01/23.

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
1	MH #1	MH #2	18	СМР	40

PIPE CONDITION				
Line & Grade:	Good			
Cleanliness:	Good			
Notes:	none			

REPAIR APPROACH	
No repairs needed	

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
2	MH #2	HW #2	18	СМР	115

PIPE CONDITION	
Line & Grade:	Good
Cleanliness:	Bottom full of silt and debris
Notes:	Rusty on bottom & deformed at joint (41.5 feet in)

REPAIR APPROACH
Remove debris
Hydro jet cleaning
Seal deformed joint
Spray line with geopolymer or polyurea

STRUCTURE REPAIR APPROACH		
MH #1	Clean out & seal joints as needed	
MH #2	Clean out & seal joints as needed	
HW #2	Clear brush to 40 LF downstream & install rip rap outlet protection	



**RUN #1 LOCATION** 

# **STORMWATER RUN #2 REPORT**

Observations:

Field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 – 08/01/23. CCTV by TV Testing & Rerounding, LLC on 07/31/23 – 08/01/23.

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
3	ES #3A	ES #3B	18	СМР	200

PIPE CONDITION	
Line & Grade:	unknown
Cleanliness:	unknown
Notes:	Inlet structure buried under debris. Could not CCTV.
	50 LF of 15" HDPE appears to be added to end of 18" CMP.

## REPAIR APPROACH

Clear land around inlet end section (ES #3A) Clear land around outlet end section (ES #3B)

Remove debris from inlet end section (ES #3B)

Remove debris from outlet end section (ES #3B)

CCTV line

Evaluate for any repairs, including possible replacement of 50 LF of 15" HDPE with 50 LF of 18" CMP

STRUCTURE REPAIR APPROACH		
ES #3A	Evaluate after clearing and debris removed	
ES #3B	Evaluate after clearing and debris removed	



**RUN #2 LOCATION** 

# **STORMWATER RUN #3 REPORT**

Observations:

Field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 – 08/01/23. CCTV by TV Testing & Rerounding, LLC on 07/31/23 – 08/01/23.

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
4	BOX #4	MH #5	48	СМР	25

PIPE CONDITION		
Line & Grade:	Good	
Cleanliness:	Several large rip rap in pipe	
Notes:	Flowing water	
	Rusty on bottom	

REPAIR APPROACH
Remove rip rap
Hydro jet cleaning
Spray line with geopolymer or polyurea

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
5	MH #5	MH #6	48	СМР	44

PIPE CONDITION		
Line & Grade:	Good	
Cleanliness:	Good	
Notes:	Flowing water	

REPAIR APPROACH	
No repairs needed	

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
6	MH #6	HW #6	48	СМР	16

PIPE CONDITION	
Line & Grade:	Good
Cleanliness:	Good
Notes:	Flowing water
	Rusty on bottom
	Separating from HW #6

REPAIR APPROACH
Hydro jet cleaning
Refit pipe to HW & grout
Spray line with geopolymer or polyurea

STRUCTURE REPAIR	STRUCTURE REPAIR APPROACH		
BOX #4	Clean out & seal joints as needed		
MH #5	Clean out & seal joints as needed		
MH #6	Clean out & seal joints as needed		
HW #6	Clear brush to 40 LF downstream & install rip rap outlet protection		



**RUN #3 LOCATION** 



HW #6

# **STORMWATER RUN #4 REPORT**

Observations:

Field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 – 08/01/23. CCTV by TV Testing & Rerounding, LLC on 07/31/23 – 08/01/23.

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
7	HW #7	MH #9	42	СМР	122

PIPE CONDITION	
Line & Grade:	Good
Cleanliness:	Debris in pipe
Notes:	none

REPAIR APPROACH	
Remove debris	
Hydro jet cleaning	

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
8	MH #8	MH #9	18	СМР	111

PIPE CONDITION	
Line & Grade:	Good
Cleanliness:	Bottom full of silt & rip rap
Notes:	Rusty on bottom

#### **REPAIR APPROACH**

Remove rip rap

Hydro jet cleaning

Spray line with geopolymer or polyurea

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
9	MH #9	MH #10	42	СМР	31

PIPE CONDITION	
Line & Grade:	Good
Cleanliness:	Large rip rap, debris, & a tarp in pipe
Notes:	none

REPAIR APPROACH
Remove rip rap, debris, & tarp
Hydro jet cleaning

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
10	MH #10	HW #10	42	СМР	187

PIPE CONDITION	
Line & Grade:	Good
Cleanliness:	Large rip rap & debris in pipe
Notes:	Flowing water

REPAIR APPROACH
Remove rip rap & debris
Hydro jet cleaning

STRUCTURE REPAIR APPROACH		
HW #7	Clean brush to 40 LF upstream & seal joint as needed	
MH #8	Clean out & seal joints as needed	
MH #9	Clean out & seal joints as needed	
MH #10	Clean out & seal joints as needed	
HW #10	Clear brush to 40 LF downstream & install rip rap outlet protection	



**RUN #4 LOCATION** 

# **STORMWATER RUN #5 REPORT**

Observations:

Field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 – 08/01/23. CCTV by TV Testing & Rerounding, LLC on 07/31/23 – 08/01/23.

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
22	MH #22	HW #22	18	СМР	73

PIPE CONDITION		
Line & Grade:	Good	
Cleanliness:	Rip rap & silt near outlet end of pipe	
Notes:	Rusty on bottom	

REPAIR APPROACH
Remove rip rap
Hydro jet cleaning
Spray line with geopolymer or polyurea

STRUCTURE REPAIR APPROACH		
MH #22	Clean out & seal joints as needed	
HW #22	Clear brush to 40 LF downstream & install rip rap outlet protection	





**RUN #5 LOCATION**
# **STORMWATER RUN #6 REPORT**

Observations:

Field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 – 08/01/23. CCTV by TV Testing & Rerounding, LLC on 07/31/23 – 08/01/23.

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
23	MH #23	MH #24	18	СМР	34

PIPE CONDITION				
Line & Grade:	Good			
Cleanliness:	Bottom full of silt			
Notes:	none			

REPAIR APPROACH	
Hydro jet cleaning	

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
24	MH #24	HW #24	18	СМР	160

PIPE CONDITION				
Line & Grade:	Good			
Cleanliness:	Bottom full of silt			
Notes:	none			

REPAIR APPROACH	
Hydro jet cleaning	

STRUCTURE REPAIR APPROACH			
MH #23	Clean out & seal joints as needed		
MH #24	Clean out & seal joints as needed		
HW #24	Clear brush to 40 LF downstream & install rip rap outlet protection		



**RUN #6 LOCATION** 

# **STORMWATER RUN #7 REPORT**

Observations:

Field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 – 08/01/23. CCTV by TV Testing & Rerounding, LLC on 07/31/23 – 08/01/23.

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
25	MH #25	HW #25	18	СМР	125

PIPE CONDITION				
Line & Grade:	Good			
Cleanliness:	Bottom full of silt and roots			
Notes:	Rip rap near end of pipe			
	Rusty on bottom			

Remove rip rap from pipe Hydro jet cleaning Spray line with geopolymer or polyurea

STRUCTURE REPAIR APPROACH			
MH #25	Clean out & seal joints as needed		
HW #25	Clear brush to 40 LF downstream & install rip rap outlet protection		



**RUN #7 LOCATION** 

# **STORMWATER RUN #8 REPORT**

Observations:

Field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 – 08/01/23. CCTV by TV Testing & Rerounding, LLC on 07/31/23 – 08/01/23.

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
11	HW #11A	HW #11B	60	СМР	122

PIPE CONDITION		
Line & Grade:	Good	
Cleanliness:	Good	
Notes:	Flowing water	
	Rusty on bottom at HW flanges	

# REPAIR APPROACH

Hydro jet cleaning Spray line with geopolymer or polyurea

STRUCTURE REPAIR APPROACH		
HW #11A	Clear brush to 40 LF upstream & seal at joints	
HW #11B	Clear brush to 40 LF downstream & install rip rap outlet protection; seal at joints	



**RUN #8 LOCATION** 

# **STORMWATER RUN #9 REPORT**

Observations:

Field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 – 08/01/23. CCTV by TV Testing & Rerounding, LLC on 07/31/23 – 08/01/23.

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
12	HW #12	MH #15	66	СМР	85

PIPE CONDITION		
Line & Grade:	Good	
Cleanliness:	Bottom full of silt	
Notes:	Flowing water	
	Separation at inlet HW flange	

REPAIR APPROACH
Reattach inlet HW
Hydro jet cleaning
Spray line with geopolymer or polyurea

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
13	MH #13	MH #14	18	СМР	31

PIPE CONDITION		
Line & Grade:	Good	
Cleanliness:	Good	
Notes:	none	

REPAIR APPROACH	
Hydro jet cleaning	

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
14	MH #14	MH #15	18	СМР	32

PIPE CONDITION		
Line & Grade:	Good	
Cleanliness:	Good	
Notes:	Rusty on bottom	

# REPAIR APPROACH

Hydro jet cleaning

Spray line with geopolymer or polyurea

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
15	MH #15	HW #15	66	СМР	140

PIPE CONDITION		
Line & Grade:	Good	
Cleanliness:	Good	
Notes:	Flowing water	
	Rusty at joints	

REPAIR APPROACH
Hydro jet cleaning
Seal joints
Spray line with geopolymer or polyurea

STRUCTURE REPAIR APPROACH				
HW #12	Clean brush to 40 LF upstream, reattach to pipe, backfill slope, & seal joint as			
	needed			
MH #13	Clean out & seal joints as needed			
MH #14	Clean out, seal joints as needed, & fill in sinkhole & sod at lid			
MH #15	Clean out debris & seal joints as needed			
HW #15	Clear brush to 40 LF downstream & install rip rap outlet protection			



**RUN #9 LOCATION** 



SINKHOLE AT MH #14 - 1291 GRAYFIELD DR.



EROSION BEHIND HW #12 – 2190 GRAYFIELD DR.



**OBSTRUCTION IN MH #15 – 2201 GRAYFIELD DR.** 

# **STORMWATER RUN #10 REPORT**

# Observations:

Field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 – 08/01/23. CCTV by TV Testing & Rerounding, LLC on 07/31/23 – 08/01/23.

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
17	HW #17	MH #18	60	СМР	100

PIPE CONDITION	
Line & Grade:	Good
Cleanliness:	Large rip rap in pipe
Notes:	Flowing water
	Rusty at joints
	Separation at inlet HW flange
	Large sinkhole in yard next to pipe

REPAIR APPROACH
Reattach inlet HW
Remove large rip rap
Hydro jet cleaning
Spray line with geopolymer or polyurea
Fill in sink hole & resod

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
18	MH #18	MH #19	60	СМР	35

PIPE CONDITION			
Line & Grade:	Good		
Cleanliness:	Good		
Notes:	Flowing water		

REPAIR APPROACH	
Hydro jet cleaning	
Seal joints as needed	
Spray line with geopolymer or polyurea	

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
19	MH #19	HW #19	60	СМР	93

PIPE CONDITION			
Line & Grade:	Good		
Cleanliness:	Good		
Notes:	Rusty on bottom		
	Rusty at joints		

# **REPAIR APPROACH**

Hydro jet cleaning Seal joints as needed Spray line with geopolymer or polyurea

STRUCTURE REPAIR APPROACH				
HW #17	Clean brush to 40 LF upstream, reattach to pipe, & seal joint as needed			
MH #18	Clean out & seal joints as needed			
MH #19	Clean out & seal joints as needed			
HW #19	Clear brush to 40 LF downstream & install rip rap outlet protection			



**RUN #10 LOCATION** 



SINKHOLE AT PIPE #17 – 2240 GRAYFIELD DR.



2240 GRAYFIELD DR. SHOWING SINKHOLE (RED DASHED LINE REPRESENTS PIPE #17 & 18)

# **STORMWATER RUN #11 REPORT**

Observations:

Field observation by Precision Planning, Inc. and City of Grayson on 07/31/23 – 08/01/23. CCTV by TV Testing & Rerounding, LLC on 07/31/23 – 08/01/23.

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
20	MH #20	MH #21	18	СМР	31

PIPE CONDITION	
Line & Grade:	Good
Cleanliness:	Bottom full of silt
Notes:	none

REPAIR APPROACH	
Hydro jet cleaning	

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
21	MH #21	HW #21	18	СМР	96

PIPE CONDITION	
Line & Grade:	Good
Cleanliness:	Bottom full of silt & debris
Notes:	Rusty bottom

# REPAIR APPROACH

Remove debris

Hydro jet cleaning

Seal joints as needed

Spray line with geopolymer or polyurea

STRUCTURE REPAIR APPROACH			
MH #20	Clean out & seal joints as needed		
MH #21	Clean out & seal joints as needed		
HW #21	Clear brush to 40 LF downstream & install rip rap outlet protection		



**RUN #11 LOCATION** 

# STORMWATER RUN #12 REPORT

Pipe #	Upstream Structure #	Downstream Structure #	Size (Inches)	Material	Length (Linear Ft.)
SDA2	HW A2	HW A1	54	СМР	40

PIPE CONDITION	
Line & Grade:	Bad (collapsed)
Cleanliness:	n/a
Notes:	Detention pond outlet structure (54" diameter corrugated metal pipe culvert) collapsed in 2018 & left a hole through the earthen dam. Existing HWs remain on-site.

# **REPAIR APPROACH**

- Replace the pond's outlet structure with a 54" diameter corrugated metal pipe & 2 new headwalls. Pipe is to be coated & have a paved invert. Approximate pipe length is 40 l.f.
- (Alternate #1) 40 l.f. of 54" diameter reinforced concrete pipe with grouted and riprap ends rather than headwalls.
- Repair the earthen dam where it is washed out with compactable fill. Approximate dimensions of repair area is 40'l x 20' w x 12'd.
- Remove & haul off approximately six 18" diameter trees from dam area.
- Riprap above & below downstream headwall.
- Regrass & mulch dam slopes & equipment access to dam.
- Contractor is responsible for all erosion control best management practices.
- Estimate use of two 8" pumps to divert water from work area.
- Access dam area through pond drainage easement between 2191 & 2201 Grayfield Drive.

Please provide a detailed scope of services proposal that includes time schedule, detailed approach to the tasks, and monetary compensation. Please provide a price for the repair with the use of corrugated metal pipe and a separate price (alternate #1) for the repair with the use of reinforced concrete pipe.

SEE ATTACHED FINAL PLAT, PHOTOS, AND DETENTION POND REPAIR EXHIBIT.













# APPENDIX C

# **TECHNICAL SPECIFICATIONS**

Measurement and Payment	01025
Traffic Control	01570
Earthwork for Utilities	02225
Cleaning of Underground Pipelines	02760
Storm Sewer Flow Control	02761
Inspection of Underground Pipelines	02762
Spray-On Pipe Liner	02765
Grassing	02931
Storm Sewers and Pipe Culverts 3	34213

# SECTION 01025

#### MEASUREMENT AND PAYMENT

#### PART 1 GENERAL

#### 1.01 SCOPE OF WORK

This Section describes the methods by which measurement will be made of the quantities for which payment will be made for the PROJECT.

#### 1.02 MEASUREMENT OF WORK

- A. WORK shall be measured by the OWNER or his representative, with assistance from the CONTRACTOR prior to preparation of a payment request by the CONTRACTOR.
- B. The CONTRACTOR shall give the OWNER a minimum of two days notice for making all required measurements.

# 1.03 PROGRESS PAYMENTS

- A. Payments shall be based on the quantity of units installed.
- B. All items of WORK not specifically listed in the Bid Pricing Schedule shall be considered incidental to the construction, and the cost of all such work and material shall be included in the prices bid for various items listed.
- C. All items listed for measurement and payment shall include all machinery, plant, materials and labor, etc., to successfully and satisfactorily complete WORK specified.
- D. Payment: The CONTRACTOR will receive payment only for the items listed in the Bid Pricing Schedule of his contract, and no separate payments will be made for the work under any section of the REQUEST FOR BIDS DOCUMENTS except as provided for in the Bid Pricing Schedule. Where measurements are required to be made by the OWNER, for the payment of a pay item, the failure of the CONTRACTOR to give the adequate notification or failure of the CONTRACTOR to give the OWNER assistance for the measurement shall result in the forfeiture of payment for the work or item which was not measured.
- E. WORK to be paid for as a "Lump Sum" shall be measured only for completion of the WORK by the CONTRACTOR.

#### PART 2 PRODUCTS

#### 2.01 STORED MATERIALS

No payment shall be made for materials stored at the project site.

## PART 3 EXECUTION

#### 3.01 MOBILIZATION AND DEMOBILIZATION

The basis of payment for this item shall be lump sum to include all activities and associated costs for transportation of CONTRACTOR's personnel, equipment and operating supplies to the site, establishment of any general facilities for the CONTRACTOR's operation at the site and premiums paid for performance and payment bonds. This item shall not include mobilization and demobilization of any specific item of work for which payment is provided elsewhere in the contract or for any materials incorporated into the permanent WORK.

#### 3.02 TRAFFIC CONTROL

The basis of payment for this item shall be lump sum for the construction, maintenance, and removal of temporary traffic control devices required for maintenance of traffic during construction, and shall include the furnishing of all materials, tools, equipment, and labor necessary to complete the work as specified or shown in the REQUEST FOR BID DOCUMENTS, or as directed by the Engineer.

#### 3.03 PRECONSTRUCTION VIDEO INSPECTION

The price for taping the interior of the existing storm sewer line prior to installation shall be per linear foot and shall include duplicating the recording and supplying one DVD copy to the OWNER.

#### 3.04 EARTHWORK FOR UTILITIES

No separate measurement or payment will be made for trench earth excavation for storm sewer line, nor for any other appurtenant facilities. Payment for all such excavation shall be included in the unit prices bid per linear foot of the various sizes and type of storm pipe laid as provided for in contract Bid Schedule. Where special bedding or cradles are shown on Drawings, or required by ENGINEER, no allowance shall be made for extending earth excavation in trenches to the bottom of such bedding or cradles.

# 3.05 ROCK REMOVAL

No separate measurement or payment will be made for trench rock excavation for storm sewer lines, nor for any other appurtenant facilities. Payment for all such excavation shall be included in unit prices bid per linear foot of the various sizes and type of pipe laid as provided for in Bid Pricing Schedule.

#### 3.06 TEMPORARY EROSION CONTROL

The basis of payment for this item shall be lump sum to include all labor, equipment and materials necessary to provide temporary erosion control throughout this contract.

# 3.07 PROTECTION, RELOCATION AND RESTORATION OF EXISTING UTILITIES

No separate measurement or payment will be made for protection, relocation and restoration of existing utilities for waterlines or other pipes, nor for any other appurtenant facilities such as valves, fire hydrants, etc. Payment for all such work shall be included in the unit prices bid for the various sizes of storm sewer line or other facilities as provided for in Bid Pricing Schedule.

## 3.08 UNDERGROUND STORM SEWER CLEANING

The basis of payment for this item shall be per linear foot for the various sizes of storm sewer line cleaned to include all labor, materials, equipment and associated costs for cleaning of pipe lines and other drainage structures as specified or shown in the REQUEST FOR BIDS DOCUMENTS.

## 3.09 REPLACE EXISTING CMP STORM SEWER WITH SRPE STORM SEWER PIPE

The basis of payment for this item shall be per linear foot for the various sizes of CMP storm sewer line removed and replaced with SRPE pipe. Measurement shall be the horizontal length of storm sewer replaced complete in place as measured along the centerline of the pipe between upstream and downstream connections to existing the storm sewer remaining in place.

The price bid shall include, but not be limited to, the pipe material shown or indicated, all labor and equipment required for the installation of the storm sewer pipe to the depths indicated or required, clearing and removal and disposal of clearing debris, stripping, storing and replacement of top soil in lawn and garden areas, excavation, dewatering of trenches, removal and replacement of signs, mailboxes, and pipes in the path of construction activities, replacement of mailbox approaches, curbs and gutters, fences, etc., protection of existing utilities (both overhead and underground), storm pipes, culverts, drainage ditches, all benching, sheeting and bracing, crushed stone bedding, tamping and compaction and backfilling, traffic maintenance and protection, dressing and final grading, testing, cleanup, and all other work incidental to place the storm sewer lines as shown or indicated in the REQUEST FOR BIDS DOCUMENTS.

#### 3.10 STORM SEWER PIPELINE LINER

Payment for this item shall be per linear foot for each type of liner and size of pipe installed. Unit price will include all necessary bypass pumping, pre- and post-video inspection and testing, rehabilitation work and materials and contractor clean-up except where provided elsewhere in the Bid Pricing Schedule.

#### 3.11 SITE RESTORATION

No separate measurement or payment will be made for site restoration. Payment for all such work shall be included in the unit prices bid per linear foot of the various sizes and types of pipe laid as provided for in Bid Pricing Schedule.

## 3.12 GRASSING

The basis of payment for permanent grassing shall be lump sum. No payment shall be made for areas disturbed outside of the easement limits; seeding of these areas shall be at the contractor's expense. Payment shall include all labor, equipment, and materials such as, but not limited to, agricultural lime and fertilizer. Payment will include ground preparation, seeding, and maintenance during the warranty period.

#### END OF SECTION 01025

#### SECTION 01570

## TRAFFIC CONTROL

## PART 1 GENERAL

#### 1.01 SCOPE OF WORK

- A. CONTRACTOR shall furnish all materials and labor for the installation and continuous maintenance of traffic control devices throughout the project.
- B. This item of work shall include furnishing, installing, maintaining, relocating and removing all traffic control devices used for the purpose of regulating, warning or directing traffic during the construction or maintenance of this project.
- C. Upon completion of work, warning devices are to be removed by the CONTRACTOR. If devices remain on site longer than ten (10) days after project completion, they shall be removed by the OWNER and become his property.

# 1.02 SAFETY

- A. The governing factor in the execution and staging of work for this project is to provide the public with the safest possible travel conditions along the roadway through the construction zone. The CONTRACTOR shall arrange his operation to keep the closing of any lane of a roadway to an absolute minimum.
- B. No work shall be started on any phase of the project until all appropriate traffic control devices are in place and in operation.
- C. CONTRACTOR is to take all practical precautions to maintain traffic flow, and provide safety of workers and the general public.
- D. At the end of each workday, contractor is to clear the roadway of all dirt and debris and add additional safety devices to maintain safe travel lanes.
- E. When not in use, all traffic control devices shall be removed, placed or covered so as not to be visible to traffic.

## 1.03 REFERENCES

- A. Manual for Uniform Traffic Control Devices (MUTCD) (latest edition).
- B. Georgia Department of Transportation (Ga. DOT) Standard Specifications Construction of Transportation Systems (latest edition), Section 150.
- C. Georgia Department of Transportation (Ga. DOT) Standard Construction Details (latest edition).

## PART 2 PRODUCTS

## 2.01 PRODUCTS

A. Traffic Control Devices include: signs and their supports, signals, pavement markings, barricades with sand bags, channelizing devices, warning lights, arrowboards, flaggers, or any other device used for the purpose of regulating, warning or guiding traffic through the construction zone.

- B. All Traffic Control Devices used on this project shall conform to the plans, Ga. DOT Construction Details and Specifications, and MUTCD. No modifications will be allowed without prior written approval of the ENGINEER.
- C. Traffic Control Devices shall be in proper, acceptable condition when in use. Devices which are unclear, damaged, or not correctly positioned shall be promptly restored to fully operational condition.

# PART 3 EXECUTION

#### 3.01 EXECUTION

- A. The CONTRACTOR shall be responsible for the proper location, installation, and arrangement of all traffic control devices. Special attention shall be given to advance warning signs during construction operations in order to keep lane assignment consistent with barricade placement at all times. The CONTRACTOR shall cover all Traffic Control Devices which are inconsistent with detour or lane assignment patterns during the transition from one construction stage to another.
- B. Construction signs referring to daytime lane closures during working hours shall be removed or covered during non-working hours.
- C. The CONTRACTOR shall ensure all Traffic Control Devices installed by him are operational 24 hours a day, including weekends and holidays. Provide additional inspections at regular intervals.
- D. When traveling in lanes open to public traffic, the contractor's vehicles shall always move with and not against or across the flow of traffic. These vehicles shall enter or leave work areas in a manner which will not be hazardous to, or interfere with, traffic and shall not park or stop except within designated work areas. Personal vehicles shall not park within the right of way except in specific areas designated by the OWNER.
- E. Private driveways and parking areas shall be accessible at all times unless temporary closings are necessary for construction work and the CONTRACTOR has notified the affected individuals and has approval from them.
- F. If trenches are to remain open overnight, or for an extended period of time, CONTRACTOR is to provide heavy duty cover plates to allow vehicles access.
- G. Delays to the CONTRACTOR by complying with these requirements will be considered incidental to the item for traffic control and protection, and no additional compensation will be allowed.
- H. Where flaggers are required they are to be adequately trained and qualified for the job.
- I. Where the roadway or shoulder must be left in a disturbed condition overnight, provide barricades with flashers at intervals so that they are continuously visible from either direction.
- J. When working adjacent to or over travel lanes, the CONTRACTOR shall ensure that dust or other debris from his operation does not interfere with normal traffic operations of adjacent properties.
- K. CONTRACTOR shall take full responsibility for employees parking and make suitable arrangements for vehicles so that no roadway hazards occur and that trespassing on private property does not occur.

# END OF SECTION 01570

#### SECTION 02225

#### EARTHWORK FOR UTILITIES

#### PART 1 GENERAL

#### 1.01 SCOPE OF WORK

Work under this section shall include all operations necessary for excavating, backfilling and compaction of material necessary for the construction of pipelines and all appurtenant facilities including concrete saddles, pipe protection, etc., and for the disposal of waste and unsuitable materials.

#### 1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM), Annual Book of Standards
  - 1. ASTM D 698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400) ft-lbf/ft<sup>3</sup>).
  - 2. ASTM D 2922, Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- B. Occupational Safety and Health Administration (OSHA), Code of Federal Regulations 29 CFR Part 1926, Subpart P Excavation, latest revision.

## 1.03 GENERAL

Elevations of the existing ground and the elevations of existing grades of structures are believed to be reasonably correct, but do not purport to be absolutely so, and, together with any schedule of quantities are presented only as an approximation. The CONTRACTOR shall satisfy himself, however, by actual examination of the site of the WORK as to the existing elevations and the amount of work required under this section. If the CONTRACTOR is not willing to accept any ground surface elevations indicated upon the Drawings for payment, he shall so notify the ENGINEER prior to starting any excavation work.

# PART 2 PRODUCTS

#### 2.01 BEDDING STONE

Class IA or IB aggregate materials in accordance with ASTM D 2321.

## 2.02 BACKFILL

Reused or imported earth free of stone, clods, broken rock, or concrete larger than 3 inches in largest dimension, or organic matter, rubbish, or other unsuitable material.

#### PART 3 EXECUTION

#### 3.01 INSPECTION

- A. Verify bedding and backfill material to be used are acceptable. Do not use frozen material.
- B. Verify areas to be backfilled are free of debris, snow, ice, or water and surfaces are not frozen.

# 3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. When necessary, compact subgrade surfaces to density requirements for backfill material.

# 3.03 SHEETING, SHORING AND BRACING

- A. CONTRACTOR shall be responsible for supporting and maintaining all excavations required even to the extent of sheeting and shoring the sides and ends of excavations with timber or other supports. All sheeting, shoring and bracing shall have sufficient strength and rigidity to withstand the pressure exerted and to conform with OSHA 29 CFR Part 1926, Subpart P Excavations, latest revision.
- B. Excavations adjacent to existing or proposed utilities, buildings and structures, or in paved streets or alleys shall be sheeted, shored and braced adequately to prevent undermining beneath or subsequent settlement of such structures or pavements. Underpinning of adjacent utilities and structures shall be done when necessary to maintain utilities and structures in safe condition. The CONTRACTOR shall be held liable for any damage resulting to such utilities, structures or pavements as a result of his operations.
- C. The need and adequacy of sheeting, shoring, bracing, or other provisions to protect men and equipment in a trench or other excavation shall be the sole and exclusive responsibility of CONTRACTOR.

# 3.04 EXCAVATION

- A. Trench Excavation
  - 1. Trench excavation shall consist of the removal of materials necessary for the construction of pipelines and all appurtenant facilities including collars, concrete saddles, and pipe protection called for on Drawings.
  - 2. Excavation for pipelines shall be made in open cut unless otherwise shown on Drawings. Trenches shall be cut true to lines and grades shown on Drawings. Minimum pipe cover shall be 48" measured from the top of pipe to the ground surface.
  - 3. Use of motor-powered trenching machine will be permitted but full responsibility for the preservation, replacement, and/or repair of damage to any existing utility services and private property shall rest with CONTRACTOR.
  - 4. Bell holes for bell and spigot pipe and/or mechanical joint pipe shall be excavated at proper intervals so the barrel of the pipe will rest for its entire length upon the bottom of the trench or bedding material.
  - 5. Pipe trenches shall not be excavated more than 400 feet in advance of pipe laying and all work shall be performed to cause the least possible inconvenience to the public. Adequate temporary bridges or crossings shall be constructed and maintained where required to permit uninterrupted vehicular and pedestrian traffic.
  - 6. Unless otherwise specified herein or shown on Drawings, wherever pipe trenches are excavated below elevation shown on Drawings, CONTRACTOR, at his own expense, shall fill the void thus made to proper grade with Class D concrete or with compacted layers of crushed rock or other material conforming to requirements specified herein for backfill.
  - 7. In all cases where materials are deposited along open trenches they shall be placed so that no damage will result to the WORK and/or adjacent property in case of rain or other surface wash.
  - 8. Remove soft, spongy, or otherwise unstable materials encountered at elevation of pipe which will not provide a firm foundation for the pipe. Extend bedding depth as necessary to reach firm materials.
- B. Any unauthorized excavation shall be corrected at the CONTRACTOR's expense.

- C. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.
- D. Grade top perimeter of excavation to prevent surface water run-off into excavation.
- E. Notify ENGINEER of unexpected subsurface conditions and discontinue work in affected area until notification to resume work.

# 3.05 DEWATERING

- A. CONTRACTOR shall provide and maintain at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the WORK. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of final lines and grades of bottoms of excavations. Methods of dewatering may include sump pumps, well points, deep wells, or other suitable methods which do not damage or weaken structures, foundations, or subgrades. Shallow excavations may be dewatered using open ditches provided such ditches are kept open and free-draining at all times. Dewatering methods used shall be acceptable to ENGINEER. Footing pits or trenches shall be protected by small earth dikes and plastic covers when they are left open in rainy weather.
- B. Unless specifically authorized by ENGINEER, groundwater encountered within the limits of excavation shall be depressed to an elevation not less than twelve (12) inches below the bottom of such excavation before pipe laying or concreting is started and shall be so maintained. No concrete structures shall be exposed to unequal hydrostatic forces until the concrete has reached its specified 28-day strength. Water shall not be allowed to rise above bedding during pipe laying operations. CONTRACTOR shall exercise care to prevent damage to pipelines or structures resulting from flotation, undermining, or scour. Dewatering operations shall commence when ground or surface water is first encountered and shall be continued until such times as water can safely be allowed to rise in accordance with provisions of this section.
- C. Standby pumping equipment shall be kept on the job site. A minimum of one standby unit (one for each ten in the event well points are used) shall be available for immediate installation should any pumping unit fail. Installation of well points or deep wells shall be adequately sized to accomplish the WORK. Drawings or design of proposed well point or deep well dewatering systems shall be submitted to ENGINEER for review.
- D. CONTRACTOR shall not operate dewatering devices (i.e., pumps, etc.) before the hour of 8:00 AM and after the hours of 8:00 PM in a residential area unless otherwise approved by ENGINEER or OWNER.
- E. If foundation soils are disturbed or loosened by the upward seepage of water or an uncontrolled flow of water, the affected areas shall be excavated and replaced with foundation backfill at no cost to OWNER. Foundation backfill shall be placed in bottom of trench to within 6" of the bottom of pipe. Six (6) inches of bedding stone shall be placed over the top of the foundation backfill.
- F. CONTRACTOR shall dispose of water from the WORK in a suitable manner without damage to adjacent property. Conveyance of water shall be such as to not interfere with construction operations or surrounding property owners. No water shall be drained into WORK built or under construction without prior consent of ENGINEER. CONTRACTOR will be held responsible for the condition of any pipe or conduit which he may use for drainage purposes, and all such pipes or conduits shall be left clean and free of sediment.
- G. Water shall be disposed of in such a manner as not to be a menace to public health and in accordance with applicable Environmental Protection Agency, Corps of Engineers, and State Environmental Protection Division standards and permits.

#### 3.06 BEDDING/BACKFILLING

- A. The backfilling of trenches shall be started immediately after construction of same has been viewed by the Project Observer. Bedding and backfill material shall be earth or aggregate in accordance with Part 2 and the Drawings. Material shall be deposited in the initial horizontal layer to the spring line of the pipe (before compaction) on each side of the pipe. The initial layer shall be thoroughly tamped or rammed around the pipe until the initial layer's density is equal to the density of the adjacent undisturbed soils. The second bedding material layer shall be deposited horizontally to a depth to provide a cover of 12 inches over top of pipe. The remainder of the backfill shall be placed in horizontal layers 18 inch (maximum) in depth. The second and subsequent bedding/backfill layers shall be compacted by compaction tools to a density equal to or greater than the density of the adjacent undisturbed soils, except under roads, structures, and driveways.
- B. Compact aggregate and soil backfill under roads, structures, and driveways to a minimum of 95% of maximum dry density at not less than 2% below nor more than 2% above the optimum moisture content as determined by ASTM D 698.
- C. All backfilling shall be done in such a manner that the pipe or structure over or against which it is being placed will not be disturbed or injured. Any pipe or structure injured, damaged or moved from its proper line or grade during backfilling operations shall be removed and repaired to the satisfaction of OWNER and then re-backfilled.
- D. Backfilling shall not be done in freezing weather except by permission of the ENGINEER, and shall not be done with frozen material or upon frozen materials.
- E. All backfilling shall be left with smooth, even surfaces, properly graded and shall be maintained in this condition until final completion and acceptance of the work. Where directed by the ENGINEER, the backfill shall be mounded slightly above the adjacent ground.
- F. Leave stockpile areas completely free of excess fill materials. After construction and cleanup, stockpile areas shall be seeded in accordance with provisions specified in Section 02931.

# 3.07 SUBSURFACE OBSTRUCTIONS

- A. In excavating, backfilling, and laying pipe, care must be taken not to remove, disturb, or injure any existing water, telephone, gas pipes, storm drainage pipe, headwalls or catch basins, or other conduits or structures, without the approval of the ENGINEER. If necessary, the CONTRACTOR at his own expense, shall sling, shore up, and maintain such structures in operation, and shall repair any damage to them. Before final acceptance of the work, he shall return all such structures to as good condition as before the work started.
- B. The CONTRACTOR shall give sufficient notice to the interested utility of his intention to remove or disturb any pipe, conduit, etc., and shall abide by their regulations governing such work. In the event that any subsurface structure becomes broken or damaged in the execution of the work, the CONTRACTOR shall immediately notify the proper authorities, and shall be responsible for all damage to persons or property caused by such breaks. Failure of the CONTRACTOR to promptly notify the affected authorities shall make him liable for any needless loss so far as interference with the normal operation of the utility.
- C. When pipes or conduits providing service to adjoining buildings are broken during progress of the work, the CONTRACTOR shall repair them at once.

- D. Delays such as would result in buildings or residences being without services overnight or for a needlessly long period during the day will not be tolerated. Should it become necessary to move the position of a pipe, conduit or structure, it shall be done by the CONTRACTOR in strict accordance with the instructions given by the ENGINEER or the utility involved.
- E. The OWNER or the ENGINEER will not be liable for any claim made by the CONTRACTOR based on underground obstructions being different from that indicated in these CONTRACT DOCUMENTS or Drawings.

## 3.08 BORROW EXCAVATION

Wherever the backfill of excavated areas or the placement of embankments or other fills require material not available at the site, suitable material shall be obtained from other sources. This may require the opening of borrow pits at points not immediately accessible to the WORK. In such cases, CONTRACTOR shall make arrangements with the property owner and shall pay all costs incident to the borrowed material including royalties, if any, for the use of the material. Before a borrow pit is opened, the quality and suitability of the material to be obtained shall be approved by the ENGINEER. Any soil tests required for approval of the borrowed material proposed shall be at the OWNER's expense.

## 3.09 DISPOSAL OF WASTE AND UNSUITABLE MATERIALS

- A. Materials removed by excavation, which are suitable for the purpose, shall be used to extent possible for backfilling pipe trenches and for making embankment fills, subgrades or for such other purposes as may be shown on Drawings. Materials not used for such purposes shall be considered waste material and shall be disposed of at the CONTRACTOR's expense.
- B. Waste materials shall be spread in uniform layers and neatly leveled and shaped. Spoil banks shall be provided with sufficient and adequate openings to permit surface drainage of adjacent lands.
- C. Unsuitable materials, consisting of rock, wood, vegetable matter, debris, soft or spongy clay, peat, and other objectionable material so designated by the ENGINEER, shall be removed from the work site and disposed of by CONTRACTOR at his expense.
- D. No waste material shall be dumped on private property unless written permission is furnished by owner of property and unless a dumping permit is issued from local jurisdiction.

# 3.10 TESTING

- A. Compaction of fill and backfill to the specified moisture-density relationship of soils shall be verified by in-place density tests using ASTM D 2922 or other ASTM in-place density tests approved by the ENGINEER. Maximum density determination and in-place density tests shall be performed by a soils technician chosen by the OWNER and paid for by the CONTRACTOR. Frequency and location of tests shall be adequate to ensure proper compaction has been achieved.
- B. Areas not meeting the required compaction shall be recompacted until the desired degree of compaction is achieved.

#### 3.11 PROTECTION

Protect excavation by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in of loose soil into excavation. Protection shall be in accordance with OSHA 29 CFR Part 1926, Subpart P-Excavations, latest revision.

## 3.12 FINAL GRADING

- A. After other earthwork operations have been completed, finished surfaces shall be left in smooth and uniform planes such as are normally obtainable from use of hand tools. If CONTRACTOR is able to obtain required degree of evenness by means of mechanical equipment, he will not be required to use hand labor methods. Slopes and ditches shall be neatly trimmed and finished.
- B. Unless otherwise specified or shown on the Drawings, all finished ground surfaces shall be graded and dressed to present a surface varying not more than plus or minus 0.10 foot. Any finished surfaces resulting in inadequate drainage or washouts shall be corrected by the CONTRACTOR at his expense.

## 3.13 SETTLEMENT

- A. CONTRACTOR shall be responsible for all settlement of backfill, fills, and embankments which may occur during warranty period.
- B. CONTRACTOR shall make, or cause to be made, all repairs or replacements made necessary by settlement within 30 days after receipt of written notice from ENGINEER or OWNER.

# END OF SECTION 02225
## CLEANING OF UNDERGROUND PIPELINES

### PART 1 GENERAL

## 1.01 SCOPE

- A. Cleaning shall be done on all lines designated for rehabilitation and elsewhere as indicated in the REQUEST FOR BIDS.
- B. Remove foreign materials from lines and restore storm sewer to condition as required for proper installation of lining materials.
- C. Where conditions such as broken pipe and major blockages occur that prevent cleaning from being accomplished, CONTRACTOR shall notify OWNER.

### PART 2 PRODUCTS

NOT USED.

## PART 3 EXECUTION

## 3.01 CLEANING EQUIPMENT

- A. High-Velocity Jet (Hydrocleaning) Equipment
  - 1. High-velocity sewer cleaning equipment shall be used for ease and safety of operation.
  - 2. Equipment shall have selection of two or more high-velocity nozzles. Nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned.
  - 3. Equipment shall include a high-velocity gun for washing and scouring manhole walls and floor. Gun shall be capable of producing flows from fine spray to solid stream.
  - 4. Equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel.
- B. Mechanically Powered Equipment
  - 1. Bucket machines shall be in pairs with sufficient power to perform work in an efficient manner.
  - 2. Machines shall be belt operated or have an overload device.
  - 3. Machines with direct drive that could cause damage to pipe will not be allowed.
  - 4. Power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 750 feet of rod. Rod shall be specifically heat-treated steel.
  - 5. Machine shall be fully enclosed and have automatic safety clutch or relief valve.

## 3.02 CLEANING PRECAUTIONS

- A. During storm sewer cleaning operations, satisfactory precautions shall be taken in use of cleaning equipment.
- B. When additional water from fire hydrants is necessary to avoid delay in normal work procedures, water shall be conserved and not used unnecessarily.

C. No fire hydrant shall be obstructed in case of fire in the area served by the hydrant.

# 3.03 STORM SEWER CLEANING

- A. Selection of equipment used shall be based on conditions of lines at time work commences.
- B. Equipment and methods selected shall be satisfactory to OWNER.
- C. Equipment shall be capable of removing dirt, grease, rocks, sand, and other materials and obstructions from storm sewer lines and other drainage structures.

## 3.04 ROOT REMOVAL

- A. Roots shall be removed in designated sections where root intrusion is a problem.
- B. Special attention shall be used during the cleaning operation to assure complete removal of roots from joints.
- C. Procedures may include use of mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners.
- D. Chemical Root Treatment
  - 1. May be used at option of CONTRACTOR to aid in removal of roots and manhole sections that have root intrusion may be treated with an approved herbicide.
  - 2. Application of the herbicide to roots shall be done in accordance with manufacturer's recommendations and specifications in such a manner to preclude damage to surrounding vegetation.
  - 3. Damaged vegetation so designated by OWNER, shall be replaced by CONTRACTOR at no additional cost to OWNER.
  - 4. Safety precautions as recommended by manufacturer shall be adhered to concerning handling and application of herbicide.

# 3.05 MATERIAL REMOVAL

- A. Sludge, dirt, sand, rocks, grease, and other solid or semisolid material resulting from cleaning operation shall be removed at the downstream end of the storm sewer line or at the closest drainage structure as needed.
- B. Passing material from junction box section to junction box section, which could cause line stoppages, accumulations of sand in wet wells, or damage pumping equipment, shall not be permitted.

# 3.06 DISPOSAL OF MATERIAL

- A. Solids or semisolids resulting from cleaning operations shall be removed from site and disposed of at a site designated and approved by OWNER in accordance with the REQUEST FOR BIDS DOCUMENTS.
- B. Materials shall be removed from site no less often than at the end of each workday.
- C. Under NO circumstances shall CONTRACTOR be allowed to accumulate debris, etc., on site of work beyond the stated time, except in totally enclosed containers and as approved by OWNER.

# 3.07 FINAL ACCEPTANCE

- A. Acceptance of storm sewer line cleaning shall be made upon the successful completion of television inspection and shall be to satisfaction of OWNER.
- B. If television inspection shows the cleaning to be unsatisfactory, CONTRACTOR shall be required to reclean and reinspect sewer line at CONTRACTOR's expense until cleaning is shown to be satisfactory.

#### STORM SEWER FLOW CONTROL

#### PART 1 GENERAL

### 1.01 SCOPE

This section describes procedures for controlling storm sewer flows in pipe sections or drainage structures being worked by plugging or blocking storm sewer lines and pumping and bypassing storm flows.

PART 2 PRODUCTS

NOT USED.

#### PART 3 EXECUTION

## 3.01 PLUGGING OR BLOCKING

- A. Plugs or other blocking devices shall be inserted into the line upstream of section being worked.
- B. Plugs and blocks shall be designed so that all or any portion of storm flow can be released.
- C. After work has been completed, flow shall be restored to normal.

## 3.02 PUMPING AND BYPASSING

- A. When pumping and bypassing is required, CONTRACTOR shall supply the pumps, conduits, and other equipment to divert storm flows around line sections or structures in which work is to be performed.
- B. Bypass system shall be of sufficient capacity to handle flows that may occur during a rainstorm.
- C. CONTRACTOR shall be responsible for furnishing necessary labor and supervision to set up and operate pumping and bypassing system.
- D. If pumping is required on a 24-hour basis, engines shall be equipped in a manner to keep noise to a minimum.

# 3.03 FLOW CONTROL PRECAUTIONS

- A. When flow in sewer line is plugged, blocked or bypassed, sufficient precautions must be taken to protect the sewer lines from damage that might result from sewer surcharging.
- B. Precautions must be taken to insure that sewer flow control operations do not cause flooding or damage to public or private property being served by sewers involved.

## INSPECTION OF UNDERGROUND PIPELINES

## PART 1 GENERAL

## 1.01 SCOPE

- A. After cleaning, manhole sections shall be visually inspected by means of closed-circuit television.
- B. Inspection will be done one manhole section at a time and flow in section being inspected shall be suitably controlled as specified in Section 02761, Sewer Flow Control.

## 1.02 EQUIPMENT

- A. Television camera used for inspection shall be one specifically designed and constructed for such inspection.
- B. Lighting for camera shall be suitable to allow a clear picture of entire periphery of pipe.
- C. Camera shall be operative in 100% humidity conditions.
- D. Color camera, color television monitor, and other components of video system shall be capable of producing picture quality to satisfaction of OWNER's Representative; and if unsatisfactory, equipment shall be removed and no payment will be made for an unsatisfactory inspection.

## PART 2 PRODUCTS

## 2.01 VIDEO DISKS

High quality, DVD format color video disks.

## PART 3 EXECUTION

## 3.01 PROCEDURES

- A. Camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of sewer's condition. In no case will television camera be pulled at a speed greater than 30 feet per minute.
- B. Manual winches, power winches, television cable, and powered rewinds or other devices that do not obstruct camera view or interfere with proper documentation of sewer conditions shall be used to move camera through sewer line.
- C. If, during inspection operation, television camera will not pass through entire manhole section, CONTRACTOR shall set up his equipment so that inspection can be performed from opposite manhole.

If, again camera fails to pass through entire manhole section, CONTRACTOR shall perform a point repair if deemed necessary by OWNER's Representative.

D. If manually operated winches are used to pull television camera through line, telephones or other

suitable means of communication shall be set up between two manholes of section being inspected to insure good communications between members of crew.

- E. Importance of accurate distance measurements is emphasized.
- F. Measurement for location of defects shall be above ground by means of a meter device.
- G. Marking on cable, or the like, which would require interpolation for depth of manhole, will not be allowed.
- H. Accuracy of distance meter shall be checked by use of a walking meter, roll-a-tape, or other suitable device, and accuracy shall be satisfactory to OWNER.

# 3.02 DOCUMENTATION OF TELEVISION RESULTS

- A. Television Inspection Logs
  - 1. Printed location records shall be kept by CONTRACTOR and will clearly show location in relation to an adjacent manhole of each infiltration point observed during inspection.
  - 2. Other points of significance such as locations of building sewers, unusual conditions, roots, storm sewer constructions, broken pipe, presence of scale and corrosion, and other discernible features will be recorded and a copy of such records will be supplied to OWNER.
- B. Photographs

Standard-size photographs of television picture of problems shall be taken by CONTRACTOR upon request of OWNER, as long as such photographing does not interfere with CONTRACTOR's operations.

- C. DVD Recordings
  - 1. Purpose of video recording shall be to supply a visual and audio record of problem areas of lines that may be replayed.
  - 2. Video recording playback shall be at same speed that it was recorded.
  - 3. Slow motion and stop-motion playback features shall be supplied by CONTRACTOR.
  - 4. CONTRACTOR shall have all video disks and necessary playback equipment readily accessible for review by OWNER during project, after which time all original disks shall become property of OWNER, and disks shall be turned over to OWNER. CONTRACTOR may make a copy of any or all disks for his records.

#### SPRAY-ON PIPE LINER

#### PART 1 GENERAL

## 1.01 SCOPE

Perform structural reconstruction of existing storm sewer lines using an approved structural geopolymer lining system by forming a new pipe within an existing structurally deteriorated pipe which has generally maintained its original shape. The geopolymer liner may be spin cast or hand sprayed.

## 1.02 RELATED WORK

- A. Section 02760 Cleaning of Underground Pipelines
- B. Section 02761 Storm Sewer Flow Control

#### 1.03 REFERENCES

A. American Society for Testing and Materials (ASTM)

This specification references ASTM standard specifications, which are made a part of hereof by such reference and shall be the latest edition and revision thereof.

- 1. ASTM C39/39M Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- 2. ASTM C293 Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Center-Point Loading).
- 3. ASTM C469 Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression.
- 4. ASTM C496/C496 Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.
- 5. ASTM C882 Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete by Slant Shear.
- 6. ASTM F2414 Practice for Sealing Sewer Manholes Using Chemical Grouting.
- B. ACI Certified Concrete Field Testing Technician, Level I.

# 1.04 INSTALLER QUALIFICIATION REQUIREMENTS

The CONTRACTOR installing the geopolymer lining must have a minimum of 10,000 linear feet of installation history with the particular product installed at pipe diameters of at least 36" or greater. For projects involving pipes 54" or larger the CONTRACTOR must have a minimum of 10,000 linear feet of installation history with the particular product they are installing with diameters 54" or larger. The CONTRACTOR must have references dating back at least 3 years of installation history with the particular geopolymer they are installing.

# 1.05 SUBMITTALS

The CONTRACTOR shall submit the following information:

- A. Submit written verification from the manufacturer documenting authorization for the CONTRACTOR to install the lining.
- B. Submit detailed installation procedures.
- C. Submit, prior to use of the materials, a satisfactory written certification of compliance with the standards for all materials. The certification shall include third- party testing of the material for short term and long term physical properties.
- D. Submit the design calculations for the wall thickness.
- E. Submit plans and procedures used for the reconstruction/rehabilitation of the pipelines at the location of each insertion shaft.
- F. Submit the flow bypass plan. The plan shall include, but not be limited to, means of diversion, bypass pumping and fluming, and amount of flow being diverted at each location.
- G. Submit accreditation for the independent testing laboratory being used.
- H. Submit a flash drive/external hard drive with corresponding files that show both the before and after conditions, including the restored connections, Video Inspection.

## PART 2 PRODUCTS

## 2.01 MATERIALS

- A. The geopolymer lining material shall be a micro-fiber reinforced ultra-dense geopolymer. This material shall provide a high strength fiber reinforced mortar specifically designed for ease of mechanical pumping, spraying and spin casting. The geopolymer lining shall be GeoSpray as manufactured by Milliken Infrastructure Solutions, LLC or approved equivalent.
- B. The geopolymer liner material shall conform to the minimum requirements, as listed below:

Physical Property	ASTM Reference	Requirement
Compressive Strength	ASTM C39	8,000 psi @ 28 days
Flexural Strength	ASTM C293	1,300 psi @ 28 days
Modulus of Elasticity	ASTM C469	5,800,000 psi @ 28 days
Bond Strength	ASTM C882	1,700 psi @ 28 days
Maximum Particle Size	ASTM C33	2.38 mm (100% No. 8 Sieve)

C. The geopolymer supplier must provide XRD (X-ray Diffraction) data showing that the preformulated mixture contains at least 70% pozzolanic material as chosen from a group of SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, MgO.

# 2.02 LINING DESIGN CRITERIA

The thickness of the lining shall be calculated and designed based upon the following physical conditions:

- A. The pipeline shall be considered fully deteriorated.
- B. The pipeline shall be subjected to an earth load (specific weight of soil =  $120 \text{ lb./ft}^3$ ) with applicable live load (HS-20 or E-80 criteria) and a water table 5 feet below top of ground (unless otherwise specified).
- C. The factor of safety shall be at least 2.
- D. The soil modulus shall not exceed 700 psi.
- E. The minimum installed geopolymer liner thickness shall be:

Pipe Diameter < 54":	1.0"
Pipe Diameter $\geq 54$ "	1.5"

## 2.03 LINING DESIGN SUBMITTAL

The lining design submittal shall include the following items:

- A. The design calculations for the wall thickness. Design calculations and drawings substantiating the geopolymer liner system thickness shall be prepared under the direction of a Licensed Structural Engineer registered in the State of Georgia or a Licensed Structural Engineer registered in the State of manufacture (Engineer of Record), with experience in the design of storm pipes or storm pipe linings.
- B. Method to verify applied thickness during installation.
- C. Field measurement of cured liner thickness.
- D. Site specific health and safety plan.
- E. Plastic indicator tabs.
- F. The new liner test results to verify 28-day compressive strength in accordance with ASTM C39.

# PART 3 EXECUTION

### 3.01 PREPARATORY PROCEDURES

A. Safety

The CONTRACTOR shall carry out his operations in strict accordance with all OSHA and manufacturer's safety requirements. Particular attention is drawn to those safety requirements involving working with scaffolding and entering confined spaces.

B. Cleaning of Line

It shall be the responsibility of the CONTRACTOR to clean the pipelines and remove internal debris out of the pipelines. Jetting, rooting and mineral deposit removal (at the discretion of OWNER) are considered conventional methods of cleaning. In pipe segments of questionable structural integrity, CONTRACTOR shall reduce the pressure of the jet and shall not direct the jet onto the cracked pipe. CONTRACTOR shall dispose of all debris removed in accordance with local, state and federal regulations or as otherwise indicated in the REQUEST FOR BIDS.

# C. Inspection of Line

Inspection of pipelines shall be performed by experienced personnel trained in locating breaks, obstacles and service connections by closed- circuit televisions. The interior of the pipeline shall be carefully inspected after cleaning & prior to lining to determine the location of any conditions that may prevent proper installation of lining into the pipelines, and it shall be noted so that these conditions can be corrected. A digital file and suitable log shall be kept for later reference.

D. Bypassing

All pumps and bypass lines shall have adequate capacity to convey the required flow. During execution of work, the CONTRACTOR shall be responsible for continuity of service to each facility connected to the pipeline. The existing pipe may flow full or under pressure at times. The CONTRACTOR shall familiarize himself with the flow conditions to be encountered at all locations. The CONTRACTOR is being made aware that operations and maintenance of the system will take priority over construction and work may be subject to disruptions. The sole compensation for any delays resulting from operation and maintenance of the pipe system shall be a time extension.

## E. Line Obstructions

It shall be the responsibility of the CONTRACTOR to clear the line of obstructions such as solids, dropped joints, protruding service connections or collapsed pipes that will prevent the insertion of the liner. If inspection reveals an obstruction that cannot be removed by conventional pipelines cleaning equipment, or the pipelines has partially collapsed, then the CONTRACTOR shall make a point repair. If the point repair could not have been identified from the bidding documents, or pre-bid video, it shall be approved in writing by the OWNER prior to the commencement of the work and shall be considered as extra work.

F. Pipe Preparation

The CONTRACTOR shall control infiltration to the extent required to install the liner in accordance with all of the manufactures requirements. The materials used for infiltration control and repairs shall be submitted to the OWNER for approval. The CONTRACTOR is responsible for the repair of all holes or fractures visible in the pre-bid video. The holes shall be filled with non-shrink grout or mortar or polyurethane foam and covered with a 3/8 inch stainless steel plate. The plate shall be sealed with epoxy sealant.

# 3.02 INSTALLATION PROCEDURES

A. Mixing

Combine all of the packaged geopolymer liner dry mix with the specified amount of potable water while mixing until proper consistency is obtained, as described by the manufacturer. The mixer must be capable of regulating the amount of water added to the mix on a consistent basis. Mixing water temperatures must be determined before blending operations begin. The mixing water temperature must be recorded in the daily operation log at multiple times throughout the day during the installation process. If water temperatures exceed 80 degrees F, then the water should be chilled to 80 degrees F or lower. The ability to provide mixing water at a consistent temperature is a critical aspect of the mixing and installation process. Tempering of the material above the manufacturers published limits is not allowed. Continue to agitate the geopolymer liner material to prevent thickening beyond the desired fluidity. The working time shall be as per manufacturer's recommendations.

- B. Application
  - 1. The geopolymer liner may be spin cast or hand sprayed to the interior surface of the host pipe after it has been properly prepared and cleaned. The geopolymer lining material shall be applied to a damp surface. However, pools of water should be removed before the start of the application of the geopolymer lining material. The spin-cast nozzle shall be attached to an oscillating spray head to ensure equal coverage on each side of the corrugations in the CMP.
  - 2. The geopolymer lining material delivery hose shall be coupled to a medium- velocity spray application nozzle. Pumping of the material shall commence and the material shall be

atomized by the introduction of air at the nozzle, creating a medium-velocity spray pattern for material application.

- 3. Where the geopolymer liner meets other pipes/liners, the joints shall be flush with no gaps, providing a uniform surface.
- 4. The geopolymer liner shall not be applied when ambient and surface temperatures are expected to fall below 36 degrees F within 72 hours of placement, without written permission from the manufacturer. For applying mortar at temperatures below 36 degrees F, the material, water and substrate shall be warmed to above a temperature of 32 degrees F. If heating the substrate is required, the area shall be properly ventilated. The newly installed liner shall be protected from freezing.
- C. Thickness Verification
  - 1. Three (3) small plastic depth gauges (plastic indicator tabs) shall be attached as a ring around the inner surface of the pipes, one (1) at the crown, and one (1) at each spring line. The depth gauges shall show the thickness as designed or specified. The gauge rings shall be placed twenty (20) linear feet apart. The preset depth gauge guides shall be positioned just below the designed or specified finished geopolymer layer. The gauges will be left in place within the geopolymer layer. These measurements must be written down in a log book which will be submitted.
  - 2. The CONTRACTOR shall be required to apply the approved designed liner thickness. Additional material thickness applied by the CONTRACTOR will be at the CONTRACTOR's own expense. No separate additional payment will be made for any extra material thickness applied above the approved designed liner thickness.
- D. Curing Follow the manufacturer's recommended cure schedule in curing of the geopolymer liner.

# 3.03 LATERAL CONNECTIONS

The CONTRACTOR shall be responsible for confirming all locations of service connections prior to installing the liner. There may be more connections than shown on the as-is plan. After the liner has been installed and inspected, the CONTRACTOR shall reconnect the existing active lateral connections. This shall be done without excavation, and in the case of non-man entry pipes, from the interior of the pipeline by means of a television camera and a cutting device that re-establishes connections to not less than 90 percent capacity. The service connection shall be finished flush with connecting pipe by polymer mortar (if necessary).

# 3.04 TESTING

- A. A minimum of four samples shall be obtained and formed into cylinders following ASTM C31 and tested in accordance with ASTM C39.
- B. The samples may be taken from the pump immediately before discharge into the hose or at the spin caster, if feasible.
- C. The samples must be undisturbed for a period of at least 24 hours before they can be transported to the independent testing laboratory.
- D. The test cylinders shall be required at the start of the project. From that point on, a set of samples shall be collected for every 25,000 pounds of material applied. A final sample set shall be collected on the last day of application.
- E. When requested by OWNER, the CONTRACTOR shall remove a test core from the installed liner

pipe at the CONTRACTOR's expense, at established intervals. The CONTRACTOR shall mark the core sample with the date that the liner was installed, the date that the core was removed, and the location within the pipe segment. The CONTRACTOR shall provide it to the testing lab. When requested by the OWNER, the pipe liner sample shall be cored at three different clock positions, and the average thicknesses measured shall be taken as the actual thickness of the spin cast liner. If a sample fails the test, additional material shall be applied to meet the thickness requirements. The CONTRACTOR shall restore the liner.

F. The CONTRACTOR shall be responsible for the preparation, documentation, labeling and storage of the test cylinders. Also the CONTRACTOR shall be responsible for deliver the test cylinders to the testing laboratory.

## 3.05 NON-CONFORMING WORK

If the thickness or the compressive strength or the compressive modulus of elasticity of the installed spin cast pipe lining is less than 90 percent of the specified values, the product is considered unacceptable. Submit a proposed method of repair or replacement for review and approval by the OWNER. Work required to remedy non-conforming work shall be at no additional cost.

## 3.06 VIDEO INSPECTION

- A. The liner shall be inspected by a closed-circuit television as well as visually. The liner shall be continuous over the entire length of installation. There shall be no infiltration of ground water visible through the liner. All lateral entrances should be accounted for and be unobstructed. The invert of the pipe or culvert shall be visible in the video.
- B. After the rehabilitation is completed, the CONTRACTOR will provide the District with a flash drive/external hard drive showing both the before and after conditions including the restored connections. The video shall be a minimum of 640x480 resolution at a data bit rate of 4.0 Mbps. The video shall be in .wmv format or approved equal.
- C. The stationing (STA) or MH labels shown in the plans shall be used in the inspection videos. 3.07 CLEAN-UP
  - A. Upon acceptance of the installation work and testing, the CONTRACTOR shall restore the project area affected by the operations to a condition at least equal to that existing prior to the work.
  - B. Excess materials and debris not incorporated into permanent installation shall be disposed of by CONTRACTOR or as otherwise indicated in the REQUEST FOR BIDS.

## GRASSING

## PART 1 GENERAL

## 1.01 SCOPE OF WORK

- A. Work under this section includes preparation of subsoil, placement of topsoil and seeding or sodding all areas disturbed during construction activities.
- B. This section also includes maintenance of all grassed areas. Maintenance consists of regular mowing, fertilizing, and regular watering until owner acceptance of project.

## 1.02 RELATED WORK

Section 02270 – Temporary Erosion Control

## 1.03 REFERENCES

- A. "Manual for Erosion and Sediment Control in Georgia" latest edition, prepared by the Georgia Soil and Water Conservation Commission.
- B. ASPA (American Sod Producers Association) Guide Line Specifications to Sodding.

## 1.04 DEFINITIONS

Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

## 1.05 QUALITY ASSURANCE AND SUBMITTALS

- A. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.
- B. Ensure strict compliance with "Manual for Erosion and Sediment Control in Georgia" latest edition, prepared by the Georgia Soil and Water Conservation Commission.
- C. Sod: Minimum age of 18 months with root development that will support its own weight without tearing when suspended vertically by holding the upper two corners.
- D. Submit sod certification for grass species and location of sod source.
- E. Submit certification of type and quantity of fertilizer and pH control material applied.
- F. Submit seed, fertilizer, and mulch mixture proposed for hydraulic seeding, if used.

## 1.06 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.
- B. Provide certificate of compliance from authority having jurisdiction indicating approval of seed mixture.

## 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
- C. Deliver sod on pallets. Protect exposed roots from dehydration.
- D. Do not deliver more sod than can be laid within 36 hours.

## 1.08 MAINTENANCE SERVICE PERIOD

Furnish maintenance of grassed areas for three (3) months from Date of Substantial Completion.

## PART 2 PRODUCTS

# 2.01 SEED MIXTURE

- A. Seed Mixture: To be based on the properly proportioned mix specified for the planting dates listed on the Drawings.
- B. Sod: ASPA Nursery grown cultivated grass sod; type indicated with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq. ft. Type of sod is to match existing. Contractor to determine type required.

### 2.02 SOIL MATERIALS

Topsoil: Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, taken from drained site; free of subsoil, clay or impurities, plants, weeds and roots; pH value of minimum 5.4 and maximum 7.0.

### 2.03 ACCESSORIES

- A. Mulching Material: Oat straw, wheat straw or wood cellulose fiber, free from weeds, foreign matter detrimental to plant life, and dry. Hay is acceptable.
- B. Fertilizer: Commercial fertilizer recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil to the following proportions: Nitrogen 5 percent, Phosphoric Acid 10 percent, Soluble Potash 15 percent.
- C. Lime: Natural limestone containing not less than 85% of total carbonates, ground so that not less than 90% passed a 10-mesh sieve and not less than 50% passes a 100-mesh sieve. Provide lime in the form of dolomitic limestone meeting the specified requirements.
- D. Water: Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.
- E. Erosion Fabric: In accordance with Section 02270.
- F. Herbicide: "Round-up" by Monsanto, or approved equivalent.
- G. Stakes: Softwood or oak lumber, chisel pointed, or steel posts.
- H. Wood Pegs: Softwood, sufficient size and length to ensure anchorage of sod.
- I. Wire Mesh: Interwoven Hexagonal plastic mesh 2 inches.

## PART 3 EXECUTION

## 3.01 EXAMINATION

Verify that prepared soil base is ready to receive the work of this Section.

## 3.02 PREPARATION OF SUBSOIL

- A. Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.
- B. Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated subsoil.
- C. Scarify subsoil to a depth of 3 inches where topsoil is to be placed. Repeat cultivation in areas where equipment, used for hauling and spreading topsoil, has compacted sub-soil.

## 3.03 PLACING TOPSOIL

- A. Spread topsoil to a minimum depth of 4 inches over area to be seeded or 2 inches over area to be sodded. Rake until smooth.
- B. Place topsoil during dry weather and on dry unfrozen subgrade.
- C. Remove vegetable matter and foreign non-organic material from topsoil while spreading.
- D. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.

# 3.04 FERTILIZING

- A. Apply fertilizer at a rate of 1500 lbs/ac.
- B. Apply lime at a rate of 2000 lbs/ac.
- C. Apply after smooth raking of topsoil.
- D. Do not apply fertilizer at same time or with same machine as will be used to apply seed. Do not apply fertilizer more than 48 hours before laying sod.
- E. Mix thoroughly into upper 2 inches of topsoil.
- F. Lightly water to aid the dissipation of fertilizer.

## 3.05 SEEDING

- A. Apply seed at a rate shown on drawings, evenly in two intersecting directions. Rake in lightly.
- B. Do not seed areas in excess of that which can be mulched on same day.
- C. Planting Season: As shown on drawings.
- D. Do not sow immediately following rain, when ground is too dry, or during windy periods.
- E. Immediately following seeding, apply mulch at a rate of 2 tons per acre. Maintain clear of shrubs and trees.

F. Apply water with a fine spray immediately after each area has been mulched. Saturate top 2 inches of soil.

#### HYDROSEEDING 3.06

- A. Products
  - 1. Grass seed - See Permanent Grassing requirement as indicated on the drawings.
  - 2. Lime shall be finely ground so that 98 percent will pass through a 20-mesh sieve and not less than 70 percent will pass through a 100-mesh sieve. Rate of lime shall be 2000 pounds (1 ton) to 4000 pounds (2 tons) per sieve.
  - Fertilizer shall be either 6-12-12 or 10-10-10 P-K-N at a rate of 1500 pounds per acre. 3.
  - 4. Fiber Mulch
    - Fiber mulch shall be wood cellulose mulch or wood pulp fiber at the rate of 500 a. pounds per acre.
    - b. Where slopes of 3/4:1 or steeper are to be hydroseeded, the fiber mulch shall be 1000 pounds per acre.

#### Β. Mixing

- 1. Thoroughly mix specified materials with water until uniformly blended into a homogeneous slurry suitable for application.
- 2. Where inoculants are to be used, four (4) times the amount of inoculant recommended by the manufacturer shall be used.

#### C. Application

- 1. Using equipment specifically designed for hydroseeding, apply the slurry at a minimum rate of 1500 pounds per acre, or at the specified seed-sowing rate as shown on the drawings. Apply seed slurry evenly in two intersecting directions with a hydraulic seeder. 2.
  - Do not sow immediately following rain, when ground is too dry, or during windy periods.
- 3. Apply water with a fine spray immediately after each area has been mulched. Saturate top 2 inches of soil.

#### 3.07 SEED PROTECTION

- A. Cover seeded slopes where grade is greater than 2:1 with erosion fabric. Roll fabric onto slopes without stretching or pulling.
- B. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Provide 12 inch overlap of adjacent rolls. Backfill trench and rake smooth, level with adjacent soil.
- C. Secure outside edges and overlaps at 36 inch intervals with stakes.
- D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.
- E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

#### 3.08 LAYING SOD

- A. Moisten prepared surface immediately prior to laying sod.
- B. Lay sod within 36 hours after harvesting to prevent deterioration.
- C. Lay sod tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.

- D. Lay smooth. Align with adjoining grass areas.
- E. Place top elevation of sod to be flush with adjoining paving or curbs.
- F. On slopes greater than 2:1, lay sod perpendicular to slope and secure every row with wooden pegs at maximum 2 feet on center. Drive pegs flush with soil portion of sod.
- G. Prior to placing sod on slopes exceeding 8 inches per foot or where indicated, place plastic mesh over topsoil. Securely anchor in place with wood pegs sunk firmly into the ground.
- H. Water sodded areas immediately after installation. Saturate sod to 3 inches of soil.

## 3.09 GENRAL ACCEPTANCE REQUIREMENTS

- A. The Contractor shall provide plant establishment of the specified permanent vegetation prior to final acceptance of the Project. Plant Establishment shall consist of preserving, protecting, watering, reseeding, or replanting and other such work and at such time as may be necessary to keep the grassed areas in a satisfactory condition. The Contractor shall water the grassed areas during such period as frequently as necessary to promote maximum practicable growth. Water shall be provided by the Contractor at his expense.
- B. The ENGINEER may require replanting at any time if an area or a portion of such area shows unsatisfactory growth. Except as otherwise specified or permitted by the ENGINEER, areas to be replanted shall be prepared in accordance with the requirements of the Specifications as if such replanting was the initial planting. However, the type of fertilizer and the application rate of fertilizer to be furnished and applied by the Contractor as a part of acceptance, occasioned by replanting, shall be determined by soils tests or otherwise established.

# 3.10 GROWTH AND COVERAGE

- A. Maintain newly graded, topsoiled, and seeded areas until final acceptance. Restore areas showing settlement or washes to specified grades at CONTRACTOR'S expense. Newly seeded areas shall be watered as necessary or reseeded at the CONTRACTOR's expense until final acceptance. An acceptable stand of grass is defined as follows:
  - 1. No bare spots larger than 3 ft<sup>2</sup>.
  - 2. No more than 10% of total area with bare spots larger than 1 ft<sup>2</sup>.
  - 3. No more than 15% of total area with bare spots larger than 6 in. square.
- B. Water to prevent grass and soil from drying out.
- C. Immediately scarify, reseed, and mulch areas which show bare spots.

#### STORM SEWERS AND PIPE CULVERTS

#### PART 1 GENERAL

## 1.01 SCOPE

The work covered in this Section shall include the furnishing and laying of pipe and fittings as called for on the Drawings and specified, including, trench excavation and backfill, headwalls and discharge basins.

### 1.02 RELATED DOCUMENTS

Documents related to the work of this Section include but are not necessarily limited to:

- A. Drawings, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications
- B. Site Clearing, Section 31 10 00
- C. Erosion and Sedimentation Control, Section 31 25 00
- D. Grading, Section 31 22 00
- E. Excavation and Fill, Section 31 23 00

## 1.03 REFERENCE DOCUMENTS

- A. Department of Transportation, State of Georgia, Standard Specifications Construction of Roads and Bridges, 1983 Edition.
- B. The Department of Transportation, State of Georgia, Roadway and Bridge Standard Plans, Drawing Number 1030D.

## 1.04 QUALITY ASSURANCE

- A. Each length of pipe, each fitting and special fitting shall be inspected by an independent commercial testing laboratory acceptable to the Engineer prior to delivery. Each joint of pipe and each special shall be stenciled or otherwise clearly and legibly marked with the laboratory's mark of acceptance.
- B. Each pipe shall be clearly marked as required by the governing ASTM standard specifications to show its class or gauge, date of manufacture, and the name or trademark of the manufacturer. Elliptical reinforced concrete pipe shall be clearly marked top and bottom and the minor axis clearly noted on interior surface of the pipe.
- C. Any pipe or specials which have been broken, cracked, or otherwise damaged before or after delivery or which have failed to meet the required tests shall be removed from the site and shall not be used therein.
- D. Pipe used in the storm sewer system shall either be reinforced concrete or ductile iron pipe. Pipe shall be in accordance with the Department of Transportation, State of Georgia, Standard Specifications Construction of Roads and Bridges, 1983 Edition; and the Department of Transportation, State of Georgia, Roadway and Bridge Standard Plans, Drawing Number 1030D; except as otherwise specified herein.

# 1.05 SUBMITTALS

Shop Drawings: The Contractor shall furnish manufacturer's product and installation data as specified herein (see Section 01 33 23 for number of copies required).

## PART 2 PRODUCTS

- 2.01 PIPE
  - A. Pipe and special fittings shall be furnished in sizes, types and classes at the locations shown on the Drawings, and/or specified herein.
  - B. All pipe and special fittings shall be of all new materials, which have not been previously used.

## 2.02 CONCRETE PIPE

- A. Concrete pipe less than 12-inches in diameter shall be non-reinforced concrete pipe conforming to ASTM C 14.
- B. Concrete pipe 12-inches and larger in diameter shall be reinforced concrete pipe conforming to ASTM C 76. All pipes shall be Class III unless otherwise shown on the Drawings. Minimum wall thickness design shall correspond to Wall C.
- C. Joints shall be bell and spigot joints and shall be O-ring rubber gasket joints and conform to ASTM C 443.
- D. Joint Materials: Rubber gaskets for bell and spigot joints shall be O-ring rubber gasket joints conforming to the latest revision of ASTM Standard Specifications C 443 for Joints for Circular Concrete Sewer and Culvert Pipe, Using Flexible Gaskets.

### 2.03 HEADWALLS

Head walls shall be as shown on the Contract Drawings.

### 2.04 BEDDING

A. Concrete Pipe: Bedding for concrete pipe shall be provided as Class "C" as shown on the Drawings.

## PART 3 EXECUTION

The location and size of storm drainage piping is as shown on the Drawings. All storm drainage shall be designed to provide adequate drainage of the areas so that no low spots holding water can develop.

# 3.01 EXCAVATION

Excavation shall be performed in accordance with the requirements of Section 31 23 00 of these Specifications.

## 3.02 PIPE LAYING - CONCRETE PIPE

- A. Lay all pipe with Class "C" bedding unless shown or specified otherwise.
- B. Immediately prior to laying the pipe, all projections or irregularities, which will prevent the joints from closing properly, shall be removed.
- C. Concrete pipe shall be laid true to line and grade on a bed that is uniformly firm throughout its entire length. If material in the bottom of the excavation is of such character as to cause unequal

settlement along the length of the storm sewer or culvert, the material shall be removed below the grade given, to such depth ordered, and shall be backfilled with granular bedding material and thoroughly tamped or otherwise compacted to ensure an unyielding foundation. Pipe shall not be laid upon frozen ground.

- D. Pipe, unless otherwise provided or directed by the Engineer, shall be laid beginning at the lower end and with the bells or receiving ends upgrade. The spigot end shall be inserted into hub or receiving end as far as the construction of the pipe will permit.
- E. The pipe shall be protected from water during placing and joining.
- F. Laying, of O-ring rubber gasket pipe shall be done in accordance with the pipe manufacturer's instructions using all the necessary materials, lubricants, and equipment recommended by the manufacturer. Rubber O-ring gaskets shall be installed so as to form a flexible watertight seal.
- G. Any pipe that is not in true alignment, shows any settlement after laying, or is damaged, shall be taken up and re-laid at the Contractor's expense.

## 3.03 APPURTUENANCES

- A. The CONTRACTOR shall furnish and install drainage structures as shown in detail on the drawings.
- B. In drainage structures with flow (i.e., inlet pipe and outlet pipe) shaped inverts are required.
- C. All mortar joints shall be filled full. Joints shall be struck flush inside and out.
- D. Joints shall not be less than 1/4" and not more than 1/2" in thickness. No spalls or bats shall be used except for shaping around irregular openings or when unavoidable at corners.
- E. All pipe entering drainage structures shall be cut and ground smooth with the face of the wall.
- F. All joints around pipe and structure walls at the face of the wall shall be packed full with mortar.
- G. Masonry construction is required to be solid. All joints and spaces shall be filled full of mortar as units are laid. Structural masonry construction practice is required. Outside joints are to be filled full of mortar and struck flush. Walls are to be constructed to line and plumb.
- H. No backfill shall be placed against any masonry until it is at least 7 days old. During cold weather, the restricted period may be extended as directed by the ENGINEER.
- I. Pipe shall not be broken by impact methods. Cutting of pipe with pipe saw is required.

## 3.04 CLEANING

After completing each section of the storm sewer or culvert, the Contractor shall remove all debris and construction materials and equipment from the site, grade and smooth over the surface on both sides of the line and leave the entire right-of-way in a clean, neat and serviceable condition in accordance with the requirements of 017700 of these Specifications.

# END OF SECTION 33 42 13