

# **INVITATION TO BID**

**FC-10337**

## **Terrell Creek Trunk System Improvements**



**ATLANTA, GEORGIA**

**Keisha Lance-Bottoms  
Mayor  
City of Atlanta**

**Kishia Powell  
Commissioner  
Department of Watershed Management**

**Susan M. Garrett  
Interim Chief Procurement Officer  
Department of Procurement**

# **FC-10337; Terrell Creek Trunk System Sewer Improvements**

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## CITY OF ATLANTA

Keisha Lance- Bottoms  
Mayor

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DEPARTMENT OF PROCUREMENT  
Susan M. Garrett  
Interim Chief Procurement Officer  
[phinton@atlantaga.gov](mailto:phinton@atlantaga.gov)

March 16, 2018

### ATTENTION INTERESTED BIDDERS:

Your firm is hereby invited to submit to the City of Atlanta (the "City"), Department of Procurement (the "DOP"), a bid for **FC-10337; Terrell Creek Trunk System Sewer Improvements**. The City of Atlanta (the "City") on behalf of the Department of Watershed Management ("DWM") seeks to secure bids from qualified bidder(s) to make improvements to the Terrell Creek trunk.

A **Pre-Bid Conference** will be held on **Tuesday, March 27, 2018, at 11:00 a.m. EST**, at the DOP's Conference Room in Suite 1900. The purpose of the Pre-Bid Conference is to provide bidders with detailed information regarding the project and to address questions and concerns. There will be representatives from the DWM, the Mayor's Office of Contract Compliance, the Ethics Office and Enterprise of Risk Management available at the conference to discuss this project and to answer any questions. Bidders are urged to attend the Pre-Bid Conference.

Bidders will be allowed to ask questions during the Pre-Bid Conference. However, please note that oral answers to questions during the Pre-Bid Conference **Tuesday, March 27, 2018, at 11:00 a.m. EST** are not authoritative. **The last date to submit questions in writing is Wednesday, April 04, 2018, at 12:00 p.m.**

Your response to this Invitation to Bid must be submitted to designated staff of the Department of Procurement at 55 Trinity Avenue, S.W., City Hall South, Suite 1900, Atlanta, Georgia 30303, **no later than 2:00 p.m. EST, Wednesday, April 18, 2018.**

**\*\*ABSOLUTELY NO BIDS WILL BE ACCEPTED AFTER 2:00 P.M.\*\***

Bids will be publicly opened and read at 2:01 p.m. on the respective due date in Suite 1900, 1<sup>st</sup> Floor, 55 Trinity Avenue, S.W., City Hall South, Atlanta, Georgia 30303.

Bidder may submit their Contractor Affidavit Forms for review via the City's IIREA Preview Participation Program, to [iireapreview@atlantaga.gov](mailto:iireapreview@atlantaga.gov) not less than ten (10) days prior to the Bid due date of April 18, 2018. The IIREA Preview Participation Form is set forth in Part 3, included in the Request for Bid.



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This Invitation to Bid is being made available by electronic means. If accepted by such means, then the Bidder acknowledges and accepts full responsibility for monitoring the DOP website for any addenda to the ITB. In the event of a conflict between a version of the Bid in the Bidders possession and the version submitted to the DOP, the version submitted to the DOP shall govern.

You are required to email and confirm receipt of your business name, contact person, address, phone number, fax number and the project number to Ms. Arkeshia Hamlett, Contracting Officer, at [ahamlett@atlantaga.gov](mailto:ahamlett@atlantaga.gov), to be placed on the Plan Holders List. Failure to do so will prevent you from receiving any addenda that are issued.

The Bid document may also be obtained from the Department of Procurement, Plan Room, City Hall South, Suite 1900, 55 Trinity Avenue, S.W., Atlanta, Georgia, 30303, at a cost of \$150.00 per package, beginning on **Friday, March 16, 2018**. All purchased solicitation documents include a scope of work booklet.

The City reserves the right to cancel any and all solicitations and to accept or reject, in whole or in part, any and all bids when it is for good cause and in its best interest.

Thank you for your interest in doing business with the City.

Sincerely,



Susan M. Garrett  
Interim Chief Procurement Officer

SMG/ah



# PART I

# Instructions to Bidders

# FC-10337; Terrell Creek Trunk System Sewer Improvements

## INSTRUCTIONS TO BIDDERS

### 1. SOLICITATION/NOT AN OFFER

This solicitation does not constitute an offer by the City of Atlanta (the “City”) to enter into an agreement and is not an offer that can be accepted by the Bidder to form an agreement. No language contained anywhere in this solicitation should be construed or interpreted to convey an offer to enter into agreement with the City. The terms of this solicitation are to be considered as a whole. However, no terms may be considered in whole or in part to constitute an offer to enter into an agreement with the City.

**This solicitation is only an invitation for offers from interested Bidders and no offer shall bind the City.**

This solicitation is an invitation for the Bidder to make an offer to the City in the form of a Bid. No offer made in response to the terms and conditions of this solicitation may include any terms and conditions which can bind the City to any contractual Agreement until such time as the Agreement has first been awarded by the City to the most responsible and responsive bidder whose bid meets the material requirements and criteria set forth in the solicitation and is accepted and fully executed and sealed by agents of the City designated on the signature page of the Agreement included in the solicitation. The term of your offer must conform to all applicable federal and local laws, including all ordinances of the City and all requirements of the solicitation.

**YOUR OFFER IS A FIRM OFFER AND MAY NOT BE WITHDRAWN EXCEPT AS AUTHORIZED IN THE CODE OF ORDINANCES OF THE CITY OF ATLANTA.**

Your response to this solicitation is a firm offer, which the City may accept or reject in whole or in part without any further action on your part. The acceptance of your offer by the City will form an Agreement, which is enforceable against you. **Your offer may not be withdrawn except under the terms and conditions specified in the Procurement and Real Estate Code of the City of Atlanta as codified in Part 5, Chapter 5 of the Code of Ordinances of the City of Atlanta or OCGA 36-91-52.**

### 2. RECEIPT AND OPENING OF BIDS

Sealed Bids for **FC-10337; Terrell Creek Trunk System Sewer Improvements** will be received by designated staff of the Department of Procurement, Suite 1900, City Hall South, 55 Trinity Avenue, S.W., Atlanta, Georgia 30303, **no later than 2:00 P.M., EDT**, (as verified by the Bureau of National Standards), on **Wednesday, April 18, 2018**.

**ABSOLUTELY NO BID WILL BE ACCEPTED AFTER 2:00 P.M.**

All Bids received by the time and date established above will be opened and publicly read.

### 3. **PREPARATION OF BIDS**

All Bids must be submitted on bid document forms supplied by the City and shall be subject to all requirements of the Agreement Documents. All Bids must be regular in every respect and no interlineations, excisions, or special conditions shall be made or included in the Bid by the Bidder.

Lump sum, unit price, and extensions of unit prices must be entered in the appropriate spaces provided on the Bid Schedule/Bid Form. Unit prices shall include an appropriate allocation of overhead and other indirect costs so that the summation of unit price extensions and lump sum items represents the total bid amount. In the case of any Bid item for which a fixed amount predetermined by the City has already been entered on the Bid Schedule, the amount so entered shall be conclusive of all Bidders as the price for such item, and shall not be revised unless the City directs a change in the Scope of Work affecting the item to which such amount relates.

The City may consider as irregular any conditional bid or any Bid on which there is an alteration of, or departure from, the Bid Schedule hereto attached and at its option may reject the same.

Erasures or other changes in the Bids must be explained or noted over the signature of the Bidder. Failure to do so shall render the Bidder as non-responsive and cause rejection of the Bid.

Failure to execute the Bid Schedule/Bid Form documents may render the Bidder as non-responsive and cause rejection of the Bid.

### 4. **GEORGIA UTILITY CONTRACTOR'S LICENSE**

The Bidder shall provide a Bidder's Georgia Utility Contractor's License Number on the outside of the Sealed Envelope. A Utility Contractor's License number held by a Subcontractor or issued by another state does NOT fulfill this requirement in lieu of the Bidder's Georgia Utility Contractor's License. Failure to provide the Bidder's Georgia Utility Contractor License Number on the outside of the sealed envelope will result in a rejection of the Bid at the Opening. The Bidder is required to submit the certificate included in Exhibit D, Additional Contract Documents.

### 5. **HOW TO SUBMIT BIDS**

The Bid and required submittals, including the Bid Schedule, the Bid Documentation, the Bid Form, the acknowledgment of each Addendum, the Bid Bond Guarantee, the Power of Attorney for the attorney-in-fact signing the Bid Guarantee, the Affidavit, Office of Contract Compliance forms/certificates, and other documents as required in these Agreement documents may be photocopied for submission of Bids. **Submit (1) original and seven (7) copies of the Bid and required attachments.**

In addition to the hard copy submittals, each Bidder shall submit two (2) digital versions of its Bid in Adobe Portable Document Format (PDF) on Compact Discs (CDs). CD One (1) version should be a duplicate of the hard copy of the Bid with no deviations in order

or layout of the hard copy Bid. CD Two (2) should be a redacted version of your hard copy Bid. Please refer to the Georgia Open Records Act (O.C.G.A. Section 50-18-72) for those items of documents that can be redacted.

The City assumes no liability for differences in information contained in a Bidder's printed Bid and that contained on the CDs. In the event of a discrepancy, the City will rely upon the information contained in the Bidder's printed material (Hard Copy). Each CD should be labeled with the Project Number, Project Name and the CD Number.

The complete package of Bid documents shall be enclosed in envelopes (outer and inner), both of which shall be sealed and clearly labeled with the project name and numbers, name of Bidder and date and time of bid opening in order to guard against premature opening of the Bid.

**Bids must be addressed to:**

**Susan M. Garrett  
Interim Chief Procurement Officer  
Department of Procurement  
55 Trinity Avenue, Suite 1900  
Atlanta, GA 30303-0307**

**6. EXECUTION OF BIDDING DOCUMENTS**

A complete set of Bidding Documents have been bound separately from the agreement forms and Specifications for the use of Bidders. Bidders shall submit their Bids, together with the bid guarantee and all forms which the Bidder is required to sign, executed in the appropriate manner as set forth below:

- a. If the Bidder is a corporation, all documents requiring execution by the Bidder shall be signed by the president or vice-president of the corporation, whose signature shall be attested by the secretary or assistant secretary of the corporation and the corporate seal affixed.
- b. If the Bidder is an individual, he or she shall sign the documents and his or her signature shall be notarized by a notary public.
- c. If the Bidder is an individual doing business under a trade name, all documents shall be signed by the Bidder whose signature shall be followed by either, "doing business as," or "trading as," followed by the trade name of the Bidder's business, and notarized by a notary public.
- d. If the Bidder is a partnership, all forms shall be executed by placing the name of the partnership followed by "By: (the name of the partner executing)" followed by the word "Partner," and notarized by a notary public.
- e. If the Bidder is a joint venture, each party to the joint venture shall execute the Bidding Documents in the manner set forth in items a, b, c, or d of this article of the Instructions to Bidders as appropriate for this type of organization.

If the Bidder is a Joint Venture, all other documents in the Bidding Documents shall be executed by one of the parties to the joint venture, as provided by Article 4 of the Joint Venture Statement, in the same manner as the executed said Joint Venture Statement.

**7. FAILURE TO BID**

Your failure to respond to this Invitation to Bid may result in the removal of your company from the City's Bid list.

**8. ERRORS IN BIDS**

Bidders and their authorized representatives are expected to fully familiarize themselves with the conditions, requirements, and Specifications before submitting Bid. Failure to do so will be at the Bidder's own risk. In case of error in extension or prices in the Bid, the unit prices(s) shall govern.

**9. DISQUALIFICATION OF BIDDERS**

Any of the following may be considered as sufficient for disqualification of a Bidder and the rejection of the Bid:

- a. Submission of more than one Bid for the same work by an individual, firm, partnership or Corporation under the same or different name(s);
- b. Evidence of collusion among Bidders;
- c. Previous participation in collusive bidding on Work for the City;
- d. Submission of an unbalanced Bid, in which the prices quoted for same items are out of proportion to the prices for other items;
- e. Lack of competency of Bidder (the Agreement will be awarded only to a Bidder(s) rated as capable of performing the Work; the City may declare any Bidder ineligible at any time during the process of receiving Bids or awarding the Agreement where developments arise which, in the opinion of the City, adversely affect the Bidder's responsibility; however, the Bidder will be given an opportunity by the City to present additional evidence before final action is taken;
- f. Lack of responsibility as shown by past Work judged from the standpoint of workmanship and progress; financial irresponsibility, including but not limited to, leaving retainage in City account;
- g. Uncompleted Work for which the Bidder is committed by Agreement, which in the judgment of the City, might hinder or prevent the prompt completion of Work under this Agreement if awarded to such Bidder; and
- h. Being in arrears on any existing or prior contracts with the City or in litigation with the City thereon or having defaulted on a previous contract with the City.

**10. REJECTION OF BIDS**

Bids may be considered irregular and may be rejected if they show omissions, alterations of forms, addition not called for, conditions, limitations, unauthorized alternate Bids or other irregularities of any kind. The City reserves the right to waive any informalities or irregularities of Bids.

**11. FAILURE TO PERFORM**

If for any reason the Contractor fails to perform any of the Work required by the Specifications, or if the Work performed is not as specified, the City reserves the absolute right to have such Work performed by other persons and deduct the cost thereof from the Bid price of the company under Agreement.

**12. BID SCHEDULE (REQUIRED SUBMITTAL)**

Unit prices shall include an appropriate allocation of overhead, other indirect costs and profits so that the summation of unit price extensions and lump sum items represents the total Bid amount. In the case of any Bid item for which a fixed amount predetermined by the City has already been entered on the Bid Schedule, the amount so entered shall be conclusive of all Bidders as the price for such item, and shall not be revised unless the City directs a change in the Scope of the Work affecting the item to which such amounts relates. Award will be based on the total fixed unit cost for all items aggregated.

**13. BID GUARANTEE (REQUIRED SUBMITTAL)**

**Bidders are required to furnish a Bid Guarantee in the amount of five percent (5%) of the total Bid amount. Bidders offering alternative Bids shall provide a guaranty for the largest total Bid amount.** At the option of the Bidder, the guaranty may be a certified check payable to the order of the City or a bid bond in the form attached. The bid bond shall be secured by a guaranty or a surety company listed in the latest issue of U.S. Treasury Circular 570. The amount of such bid bond shall be within the maximum amount specified for such company in Circular 570. No Bid shall be considered unless it is accompanied by the required guaranty. Bid Guarantee shall insure the execution of the Agreement and the furnishing of the performance and payment bonds and insurance by the successful Bidder as required by the Agreement Documents. The Bid Guarantee of the Bidders submitting the five (5) lowest total Bid amounts for the Agreement will be retained either until the successful Bidder has signed the Agreement and furnished performance and payment bonds and certificates of insurance, or until the ninetieth (90th) calendar day after the Bid opening date, whichever is sooner. Other Bid Guarantees will be returned within ten (10) calendar days after the Bid opening date. Bid Guarantees being held pending the signing of the Agreement and furnishing other documents will be returned within three (3) calendar days thereafter. Each Bidder agrees that if it is awarded the Agreement and fails within the time stipulated to execute the Agreement and to furnish the other documents required, the City will retain the Bid Guarantee as liquidated damages and not as a penalty.

Attorneys-in-fact who sign bid bonds must file with the bond a certified and effectively dated copy of their power of attorney.

**14. STATEMENT OF BIDDER'S QUALIFICATIONS (REQUIRED SUBMITTAL)**

The statement of Bidder's Qualifications must be filled out completely, signed by the Bidder, and notarized.

The City shall have the right to require such additional information, as it deems necessary to evaluate the ability of the Bidder to successfully perform the Work.

The City reserves the right to reject any Bidder who does not satisfy the City as to his ability to successfully perform the Work, previous pre-qualification notwithstanding.

The cause for rejection shall include:

- a. Non-compliance of the Bidder with the requirements of an equal employment opportunity in contracting program as may be prescribed by ordinance;
- b. Non-compliance by the Bidder with the requirements of a minority and female business enterprise participation program as may be prescribed;
- c. Inadequate quality, availability and adaptability of the supplies or services to the particular use required; or
- d. Unacceptable number and scope of conditions attached to the Bid by the Bidder, if any.

**15. AFFIDAVIT (REQUIRED SUBMITTAL)**

Affidavits must be filled in completely, signed by the Bidder, and notarized. Violation of the statements set forth in this affidavit may be grounds for rejection of Bid, or termination of Agreement by the City, as appropriate, as well as other appropriate remedies as provided by local, state, and federal statutes.

**16. EQUAL BUSINESS OPPORTUNITY PROGRAM (REQUIRED SUBMITTAL)**

The Bidder shall complete the Equal Business Opportunity (“**EBO**”) Program documents in accordance with the instructions included in Appendix A, Requirements of the Office of Contract Compliance and shall properly execute the documents.

A determination by the City that misstatements have been made by the Bidder in this document shall cause rejection of Bid or termination of Agreement, as appropriate and shall be grounds for other remedies available under City ordinances, and state or federal statutes.

**17. AUTHORIZATION TO TRANSACT BUSINESS (REQUIRED SUBMITTAL)**

Each Bidder must submit with its Bid documentation that demonstrates it is duly authorized to conduct business in the State of Georgia. If the Contractor is a corporation or corporations combined to form a joint venture, the corporation or members of the joint venture team, prior to Agreement execution, must submit documentary evidence from the



Secretary of State that the corporation is in good standing and that the corporation is authorized to transact business in the State of Georgia.

**18. BUSINESS NON-DISCRIMINATION POLICY**

The City prefers to do business with firms or institutions that include representation of minorities and women at all levels.

**19. EQUAL EMPLOYMENT OPPORTUNITY (“EEO”) IN PURCHASING AND CONTRACTING**

To be eligible for award of this Agreement, the Bidder must certify and fully comply with the requirements, terms, and conditions of the section on EEO.

**20. CONTRACT EMPLOYMENT REPORT**

Upon award of an Agreement with the City, the successful Bidder must submit a Contract Employment Report (“CER”) and supplemental information as required to comply with the paragraph, “Monitoring of EEO Policy, Requirements of the Office of Contract Compliance”.

**21. FIRST SOURCE JOBS POLICY EMPLOYMENT AGREEMENT  
(REQUIRED SUBMITTAL LOCATED IN APPENDIX A)**

The Bidder shall acknowledge and implement the First Source Jobs Policy.

**22. BID FORM; BID DATA; CHECKLIST (REQUIRED SUBMITTALS)**

The Bidder must complete and execute these sections of the Bidding documents.

**23. WAGE RATES OF CITY OF ATLANTA FUNDED CONSTRUCTION PROJECTS**

Contractor is Responsible for all Federal and State government wage requirements.

**24. PRE-BID INSPECTION**

Prior to submission of a Bid, the Bidder shall have made a thorough examination of the Work Site. The Bidder shall become informed as to the nature of the proposed construction, the kind of facilities required to carry out the construction, labor conditions, and all other matters that may affect the cost and time of completion of the Work upon which it bids.

The Bidder shall make itself familiar with all of the Agreement documents and other instructions before submitting its Bid, in order that no misunderstanding shall exist in regard to the nature and character of the Work to be done. No allowance shall be made for any claims that the Bid is based on incomplete information as to the nature and character of the site or the Work involved.

The Contractor, by execution of the Agreement, shall in no way be relieved of any obligation under it due to its failure to receive or examine any form or legal instrument or to

visit the site and acquaint itself with the conditions there existing, and the City shall be justified in rejecting any claims based on facts regarding that which the Contractor should have known as a result thereof.

**25. ADDENDA AND INTERPRETATIONS**

All questions by prospective Bidders as to the interpretations of the Bidding Documents must be submitted in writing to: Ms. Arkeshia Hamlett, Contracting Officer, City of Atlanta, Department of Procurement, 55 Trinity Avenue, S.W. Suite 1900, Atlanta, Georgia 30303, or faxed to (404) 979-7459 or emailed to [ahamlett@atlantaga.gov](mailto:ahamlett@atlantaga.gov), and must be received by **Wednesday, April 04, 2018, by 12:00 P.M. EST.** Every interpretation made to a Bidder will be in the form of an addendum to the Bidding Documents, and when issued, will be on file in the Department of Procurement. In addition, all addenda will be mailed to each person holding Bidding Documents, but it shall be the Bidder's responsibility to make inquiry as to the addenda issued. All such addenda shall become part of the Agreement and all Bidders shall be bound by such addenda, whether or not received by the Bidders.

The City shall not be bound by any information, explanation, clarification, or any interpretation, oral or written, by whosoever made, that is not incorporated into an addendum to the Bidding Documents. No response shall be made to inquiries received later than **12:00 P.M. EST on Wednesday, April 04, 2018.**

**26. PROHIBITED CONTACTS**

Any questions regarding this ITB should be submitted in writing to City's contact person, **Ms. Arkeshia Hamlett**, Contracting Officer, City of Atlanta, Department of Procurement, 55 Trinity Avenue, SW, Suite 1900, Atlanta, Georgia 30303-0307 or e-mail [ahamlett@atlantaga.gov](mailto:ahamlett@atlantaga.gov). All Bidders and representatives of any Bidder are strictly prohibited from contacting any other City employees or any third-party representatives of City on any matter having to do with this ITB. All communications by any Bidder concerning this ITB must be made to the City's contact person, or any other City representatives designated by the Chief Procurement Officer in writing.

**27. PRE-BID CONFERENCE**

A Pre-Bid Conference will be held on **Tuesday, March 27, 2018, at 11:00 A.M. EST**, at Department of Procurement, Suite 1900, City Hall South, 55 Trinity Avenue, S.W., Atlanta, GA 30303. At that time, the general requirements of the project will be discussed. Any additional questions raised by Bidders will be discussed. It is **strongly** encouraged that all Bidders attend the Pre-Bid Conference.

General requirements of the project will be discussed at the Pre-Bid Conference. Also discussed will be questions regarding preparation and submission of Bids and general contractual requirements. Bidders will be allowed to ask questions. **Oral answers to questions during the Pre-Bid Conference will not be authoritative.**

It should be emphasized, however, that nothing stated or discussed during the course of this conference shall be considered to modify, alter or change the requirements of the

Bidding Documents, unless it shall be subsequently incorporated into an addendum to the Bidding Documents.

**28. TIME FOR RECEIVING BIDS**

Sealed Bids for this project will be received by designated staff of the Department of Procurement, Suite 1900, City Hall South, 55 Trinity Avenue, S.W., Atlanta, GA 30303, no later than 2:00 P.M. EDT, (as verified by the Bureau of National Standards) on **Wednesday, April 18, 2018. ABSOLUTELY NO BIDS WILL BE RECEIVED AFTER 2:00 P.M. EDT. ON THE RESPECTIVE DATE.** All Bids received by the time and date set forth will be opened publicly and read at **2:01 P.M.** in the Department of Procurement Bid Conference Room, Suite 1900, at the aforementioned address.

Bids received prior to the advertised hour of opening will be kept secured and sealed. The contracting officer whose duty it is to open them will decide when the specified time has arrived, and no Bid received thereafter will be considered, except that when a Bid arrives by mail after the time fixed for opening, but before the reading of all other Bids is completed, and it is shown to the satisfaction of the City that the non-arrival on time was due solely to delay in the mail for which the Bidder was not responsible, such Bid will be received and considered.

**29. BID MODIFICATION AND WITHDRAWAL**

Bids may be modified after they have been submitted, but only before the Bid opening date and time. Modifications must be signed by the Bidder and must be received by the City no later than the Bid opening time and date. Modifications should not reveal the total Bid amount, but should identify the addition and subtraction or other modification in a manner in which the prices will not be known by the City until the sealed Bid is opened.

Bids may be withdrawn after they have been submitted, but only before the Bid opening date and time. Withdrawn bids may be resubmitted, but only in the manner in which the Bid was originally submitted. Withdrawals must be signed as stipulated above for modification. Bids may not be withdrawn between the Bid opening time and one hundred and eighty (180) calendar days thereafter, except as may be agreed upon by a written agreement between the Bidder and the City.

**30. BID EVALUATION**

- a. Each Bid timely received and in the City's hands at the time set forth for the Bid opening shall constitute an offer to perform the Agreement on the terms and conditions thereof, in strict accordance with the Agreement documents, and all other requirements, all for the Bid total. For good cause and valuable consideration, the sufficiency of which is acknowledged by submittal of a Bid, each Bidder promises and agrees that its Bid shall be irrevocable for a period of ***one hundred eighty (180) calendar days*** after the Bid opening and will not be withdrawn or modified during that time. The City may accept any Bid by giving the Bidder Written Notice of acceptance during that time. If necessary, the period of time specified may be extended by written agreement between the City and the Bidder or Bidders concerned.

- b. After the Bids have been opened and before any award is made, the City will evaluate the Bid process, the Bid total, the supplements to the Bid form, Bidder's experience, financial data, Local Preference Program, proposed Subcontractors and equipment manufacturers and other data relating to Bidders' responsibility and qualifications to perform the Agreement satisfactorily.
- c. All extension of the unit prices shown and the subsequent addition of extended amounts may be verified by the City. In the event of a discrepancy between the unit price bid and the extension, the unit price will be deemed intended by the Bidder and the extension shall be adjusted. In the event of a discrepancy between the sum of the extended amounts and the bid total, the sum of the extended amounts shall govern.
- d. Bidder may be required to submit, in writing, the addresses of any proposed Subcontractors or equipment manufacturers listed on the Bid, and to submit other material information relative to proposed Subcontractors or Equipment manufacturers. The City reserves the right to disapprove any proposed Subcontractor or equipment manufacturers whose technical or financial ability or resources or whose experience are deemed inadequate.
- e. The City reserves the right to reject any Bid the prices of which appear to be unbalanced, and to reject any or all Bids, or parts thereof, if it determines, in its sole discretion, that such rejection is in the best interest of the City. Where only a single responsible and responsive Bid is received, the City may in its sole discretion, elect to conduct a price or cost analysis of the Bid. Such Bidder shall cooperate with such analysis and provide such supplemental information as may be required. The determination whether to enter into an Agreement with such sole Bidder shall be solely within the City's discretion and not dependent upon performance of a price or cost analysis.
- f. Bids will be evaluated on the basis of determining the lowest Bid total of a Bidder, not including alternates, whose Bid is responsive to the Invitation to Bid and who is determined to be technically, financially and otherwise responsible to perform the Agreement satisfactorily, and to meet all other requirements of the Bidding Documents relating thereto. Any Bid may be rejected if it is determined by the City to be non-responsive, provided, however, that the City reserves the right to waive any irregularities or technicalities which it determines, within its sole discretion, to be minor in nature and in the interest of the public. Furthermore, any Bid may be rejected if it is determined by the City, in its sole discretion, that the bidder is not capable of performing the Agreement satisfactorily based upon review of its experience and technical and financial capabilities, or the failure of such bidder to provide information requested relating to such determination. Additionally, the City reserves the right to disqualify Bids, before and after the bid opening, upon evidence of collusion with intent to defraud or other illegal practices upon the part of any Bidder(s).
- g. The City intends to award the Agreement at the earliest practicable date to the lowest responsive, responsible Bidder(s), provided that the Bid is within the funds available for the project. In addition, the City reserves the right to reject any and/or all Bids if it determines, in its sole discretion that the public interest will be best served by doing so.
- h. A Pre-award Conference may be conducted with the apparent low Bidder(s) to review general requirements of the Bidding Documents.

### 31. **AWARD CRITERIA**

Award will be made after evaluating the prices, responsiveness and responsibility of each Bidder.

- a. The **responsiveness** of a Bidder is determined by the following:
  1. A timely and effective delivery of all services, materials, documents, and/or other information required by the City;
  2. The completeness of all material, documents and/or information required by the City; and
  3. The notification of the City of methods, services, supplies and/or equipment that could reduce cost or increase quality.
- b. The **responsibility** of a Bidder is determined by the following:
  1. The ability, capacity and skill of the Bidder to perform the Agreement or provide the Work required;
  2. The capability of the Bidder to perform the Agreement or provide the Work promptly, or within the time specified without delay or interference;
  3. The character, integrity, reputation, judgment, experience and efficiency of the Bidders;
  4. The quality of performance of previous contracts or work;
  5. The previous existing compliance by the Bidder with laws and ordinances relating to the Agreement or Work;
  6. The sufficiency of the financial resources and ability of the Bidder to perform Agreement or provide the Work;
  7. The compliance of the Bidder with the requirements of Division II, Equal Employment Opportunity (EEO), and Division 12, Minority and Female Business Enterprises, of the City's Department of Procurement;
  8. The quality, availability and adaptability of the supplies or contractual Work to the particular use required; and
  9. The successful Bidder shall assume full responsibility for the conduct of his agents and/or employees during the time such agents or employees are on the premises for the purpose of performing the Work herein specified.

### 32. **SURETY BONDS**

Regarding submission of surety bonds prior to or subsequent to the Bid submission, the following requirements pertain:

- a. Any surety bond submitted in accordance with the Bid or Agreement requirements must be issued by a corporate surety company satisfactory to the City and authorized to act as such in the State of Georgia;
- b. Such bonds shall conform to the forms provided with the Bid Documents and be completed in accordance with the instructions thereon; and
- c. In accordance with Georgia law, and upon award of the Agreement, separate performance and payment bonds shall be required of the successful Bidder, each in an amount not less than the total amount payable under the Agreement.

The performance bond shall remain in effect for two (2) years after final acceptance of the Work or the guaranty period under the Agreement, whichever is the larger.

The payment bond shall remain in effect for the period required under Georgia law for the payment bonds on public construction agreements. Reference is made to the bond forms and the Agreement Documents for additional particulars of the terms required in the bonds. In the case of any inconsistency between the Bond Forms and Georgia law, the law shall control. Finally, alterations, extension of the time allowed for performance, extra and additional Work, and other changes authorized under the Agreement may be made without notice to or consent of the surety or sureties.

### **33. POWER OF ATTORNEY**

Attorneys-in-fact who sign agreement bonds must file with each bond a certified copy of their power of attorney with the appropriate effective date.

### **34. INSURANCE REQUIREMENTS**

The Contractor shall procure and maintain during the life of this Agreement, Workmen's Compensation, Public Liability, Property Damage, Automobile Liability insurance and any other insurance necessary to satisfy the requirements of the Agreement Documents.

### **35. LAWS AND REGULATIONS**

The Bidder's attention is directed to the fact that all applicable state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Agreement throughout, to the extent that such requirements do not conflict with federal laws or regulations, and they will be deemed to be included in the Agreement the same as though therein written out in full.

Bidder's attention is directed to the following laws and regulations:

- a. Wages under this Agreement must not be less than the minimum wage rates specified for Atlanta-funded projects as set forth in these documents;

- b. Applicable provisions of the Occupational Safety and Health Act (“**OSHA**”) must be observed during Work under this Agreement; and
- c. Appendix A – Requirements of the Office of Contract Compliance.

**36. AGREEMENT TERMS**

Contractor shall commence the Work within ten (10) calendar days after receipt of Notice to Proceed. Contractor shall achieve Substantial Completion and Final Completion of the Services required by a Work Order within the times set forth in a Work Order. The term of this contract shall be for eighteen (18) months.

**37. LIQUIDATED DAMAGES**

The performance of the Work under Agreement within the specified time is essential to the City's economic interests. The attention of potential Bidders is directed to the provisions of the Agreement Documents, which establish the basis for liquidated damages to be paid to the City in the event that the Work is not completed on schedule.

**38. EXECUTION OF AGREEMENT**

Subsequent to the award and within fifteen (15) days after the prescribed forms are presented for signature, the successful Bidder shall execute and deliver to the City **seven (7) copies** of the City-Contractor Agreement as included in the Agreement Documents and provide performance and payment bonds and insurance certificates. The failure of the successful Bidder to execute the City-Contractor Agreement and to supply the required bonds within fifteen (15) days after the prescribed forms are presented for signature, or within such extended period as the City may grant, based upon reasons determined sufficient by the City, shall constitute a default, and the Bidder shall forfeit the Bid Guarantee and the City may either award the Agreement to the next lowest responsive Bidder or re-advertise for Bids, and may proceed against the bid bond of the defaulted Bidder. If a more favorable Bid is received by re-advertising, the defaulting Bidder shall have no claim against the City for a refund.

**39. PRE-CONSTRUCTION CONFERENCE**

A pre-construction conference may be held with the successful Bidder and all known Subcontractors at a time and place set by the City.

**40. SUBSTITUTIONS**

Whenever a Material, article, or piece of Equipment is identified on the Plans or in the Specifications by reference to manufacturers' or vendors' names, trade names, catalog numbers, etc., it is intended to establish a standard, and any Material, article, or Equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable, provided the Material, or Equipment so proposed is, in the opinion of the Engineer, of equal substance and function. It shall not be purchased or installed by the Contractor without the Engineer's written approval.

Whenever the design is based on a specific product of a particular manufacturer or manufacturers, the manufacturer(s) will be shown on the Drawings and/or listed in the Specifications. Any item other than those so designated shall be considered a substitution.

If the manufacturer is named in the Drawings and/or detailed specifications as an approved manufacturer, products of that manufacturer meeting all Specification requirements are acceptable.

Approval of any substitution will be made under the following provisions:

- a. If the term "OR EQUAL" follows the names of approved manufacturers, then other manufacturers desiring approval may submit the product to the Engineer for approval during the bidding phase. The manufacturer should include the following items in this pre-submittal:
  1. Descriptive literature, including information on materials used, minimum design standards features, manufacturing processes and facilities, and similar information, which will indicate experience and expertise in the manufacture of the product being evaluated;
  2. Performance specifications applicable to the manufacturer's standard design, which indicate the level of performance to be expected from the product;
  3. A complete set of submittal Drawings of similar Equipment that has been completed and placed into operation;
  4. A list of existing installations of equipment similar in type and size;
  5. Evidence of technical ability of the manufacturer to design and manufacture Equipment and systems meeting project requirements. Evidence submitted shall include, at a minimum, descriptions of engineering and manufacturing staff capabilities;
  6. Information required to satisfy specified experience requirements or a copy of the bond to be submitted in lieu of experience;
  7. A complete description of field service capabilities, including the location of field service facilities which would serve the proposed facility and the number and qualifications of personnel working from that location;
  8. A complete list of all requirements of the Drawings and Specifications with which the manufacturer cannot conform, including reasons why alternate features are considered equivalent; and
  9. All other information necessary to fully evaluate the product for consideration.
- b. This pre-submittal shall reach the Engineer no later than three (3) weeks prior to the Bid date. Manufacturers will be advised of approval or rejection in writing no later



than fourteen (14) days prior to the Bid date. Rejected submittals may be supplemented with additional information and resubmitted no later than one (1) week prior to the bid date. Manufacturers making supplementary submittals will be advised of approval or rejection in writing no later than three (3) days prior to the bid date.

NOTE: Bids based on equipment, which has not received the approval of the Engineer, will render the Bidder as non-responsive and cause rejection of the Bid.

- c. If the term "EQUAL TO" precedes the names of approved manufacturers in the Specifications, the Contractor may, after receiving the Notice to Proceed, submit Shop Drawings on the substitute product for the approval of the Engineer.

Any Bidder intending to furnish substitute products is cautioned to verify that the item being furnished will perform the same functions and have the same capabilities as the item specified. The Bidder shall include in his bid the cost of accessory items, which may be required by the substitute product and any architectural, structural, mechanical, piping, electrical or other modifications required to accommodate the substitution.

Approval of the Engineer is dependent on his determination that the product offered is essentially equal in function, performance, quality of manufacture, ease of maintenance, reliability, service life and other criteria to that on which the design is based, and will require no major modifications to structures, electrical systems, control systems, or piping systems.

#### **41. ILLEGAL IMMIGRATION REFORM AND ENFORCEMENT ACT**

Each Bidder must complete and submit a Contractor's Affidavit attached hereto as Part I, Section II, Form 1; Illegal Immigration Reform and Enforcement Act Forms with its bid. This ITB is subject to the Illegal Immigration Reform and Enforcement Act of 2011 (the "ACT"). Pursuant to the Act, the Bidder must provide with its proposal proof of its registration with and continuing and future participation in the E-Verify Program established by the United States Department of Homeland Security. Under state law, the City cannot consider any proposal which does not include a complete Contractor's Affidavit. It is not the intent of this notice to provide detailed information or legal advice concerning the Illegal Immigration Reform and Enforcement Act. All bidders/proponents intending to do business with the City are responsible for independently apprising themselves and complying with the requirements of that law and its effect on City procurements and their participation in those procurements. For additional information on the E-Verify program or to enroll in the program, go to: <https://e-verify.uscis.gov/enroll>.

- Potential Offerors may submit their Contractor Affidavit Forms for review via the City's IIREA Preview Participation Program, not less than ten (10) days prior to the Bids due date. The IIREA Preview Participation Form is set forth in Part 3, included in the Request for Bid.

**+ + + END OF INSTRUCTIONS TO BIDDERS + + +**

# Required Submittal Forms

# REQUIRED SUBMITTAL FORMS

All Respondents, including, but not limited to, corporate entities, limited liability companies, joint ventures, or partnerships, that submit a Proposal or Bid in response to this solicitation must fill out all forms in their entirety, and all forms must be signed, notarized or sealed with the corporate seal (if applicable), as required per each form's instructions.

If Respondent intends to be named as a Prime Contractor(s) with the City, then Respondent must fill out all the forms listed in this solicitation document; otherwise, Respondent may be deemed non-responsive.

## **Required Submittal (FORM 1)**

### **Illegal Immigration Reform and Enforcement Act Forms (Page 1 of 3)**

#### **INSTRUCTIONS TO PROPONENTS/BIDDERS:**

All Proponents/Bidders must comply with the Illegal Immigration Reform and Enforcement Act, O.G.G.A § 13-10-90, et seq. (IIREA). IIREA was formerly known as the Georgia Security and Immigration Compliance Act or GSICA. Proponents/Bidders must familiarize themselves with IIREA and are solely responsible for ensuring compliance. Proponents/Bidders must not rely on these instructions for that purpose. They are offered only as a convenience to assist Proponents/Bidders in complying with the requirements of the City's procurement process and the terms of this RFP.

1. The attached Contractor Affidavit (Form 1) must be filled out COMPLETELY and submitted with the proposal/bid prior to proposal due date.
2. The Contractor Affidavit must contain an active Federal Work Authorization Program (E-Verify) User ID Number and Date of Registration. **This is also known as the Company ID Number. Please note that the Company ID number is not a Tax ID number, social security number or formal contract number.**
3. Where the business structure of a Proponent/Bidder is such that Proponent/Bidder is required to obtain an Employer Identification Number (EIN) from the Internal Revenue Service, Proponent/Bidder must complete the Contractor Affidavit on behalf of, and provide a Federal Work Authorization User ID Number issued to, the Proponent itself. Where the business structure of a Proponent/Bidder does not require it to obtain an EIN, each entity comprising Proponent/Bidder must submit a separate Contractor Affidavit.

**Example 1**, ABC, Inc. and XYZ, Inc. form and submit a proposal/bid as Acme Construction, LLC. Acme Construction, LLC must enroll in the E-verify program and submit a single Contractor Affidavit in the name of Acme Construction, LLC which includes the Federal Work Authorization User ID Number issued to Acme Construction, LLC.

**Example 2**, ABC, Inc. and XYZ, Inc. execute a joint venture agreement and submit a proposal/bid under the name Acme Construction, JV. If, based on the nature of the JV agreement, Acme Construction, JV is not required to obtain an Employer Identification Number from the IRS. The Proposal/Bid submitted by Acme Construction, JV must include both a Contractor Affidavit for ABC, Inc. and a Contractor Affidavit for XYZ, Inc.

4. All Contractor Affidavits must be executed by an authorized representative of the entity named in the Affidavit.
5. All Contractor Affidavits must be duly notarized.
6. All Contractor Affidavits must be submitted with proposal/bid package.
7. Subcontractor and sub-subcontractor affidavits are not required at the time of proposal/bid submission, but will be required at contract execution or in accordance with the timelines set forth in IIREA.

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

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 Atlanta 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 (*Also known as E-Verify Company ID.  
Not Tax ID or SS Number*)

\_\_\_\_\_  
Date of Authorization (*This is the date the Company ID was issued by the Federal E-Verify system*)

\_\_\_\_\_  
Name of Contractor (*Legal name of Contractor, not an abbreviated version*)

\_\_\_\_\_  
Name of Project

City of Atlanta

\_\_\_\_\_  
Name of Public Employer

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

Executed on \_\_\_\_\_, \_\_\_\_\_, 201\_\_ 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 \_\_\_\_\_, 201\_\_.

\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires:  
  
\_\_\_\_\_

### **Subcontractor Affidavit under O.C.G.A. § 13-10-91(b)(3)**

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

\_\_\_\_\_  
Federal Work Authorization User Identification Number (*Also known as E-Verify Company ID*)

\_\_\_\_\_  
Date of Authorization (*This is the date the Company ID was issued by the Federal E-Verify system*)

\_\_\_\_\_  
Name of Subcontractor (*Legal name of Contractor, not an abbreviated version*)

\_\_\_\_\_  
Name of Project

City of Atlanta

\_\_\_\_\_  
Name of Public Employer

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

Executed on \_\_\_\_\_, \_\_\_\_\_, 201\_\_ 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 \_\_\_\_\_, 201\_\_.

\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires:  
\_\_\_\_\_

**Required Submittal (FORM 2)**  
**Contractor Disclosure and Declaration Form (Page 1 of 8)**

***DEFINITIONS FOR THE PURPOSE OF THIS DISCLOSURE AND DECLARATION FORM***

<b>“Affiliate”</b>	Any legal entity that, directly or indirectly through one of more intermediate legal entities, controls, is controlled by or is under common control with the Respondent or a member of Respondent.
<b>“Contractor or Vendor”</b>	Any person or entity having a contract with the City of Atlanta ("City").
<b>“Control”</b>	The controlling entity: (i) possesses, directly or indirectly, the power to direct or cause the direction of the management and policies of the controlled entity, whether through the ownership of voting securities or by contract or otherwise; or (ii) has direct or indirect ownership in the aggregate of fifty-one (51%) or more of any class of voting or equity interests in the controlled entity.
<b>“Respondent or Offeror”</b> (the terms are interchangeably used on this Form)	Any individual or entity that submits a Bid/Proposal in response to a solicitation.  If the Respondent is an individual, then that individual must complete and sign this Contractor Disclosure and Declaration Form where indicated. If the Respondent is a partnership (including but not limited to, joint venture partnership), then each partner in the partnership must complete and sign a separate Contractor Disclosure and Declaration Form where indicated. If the Respondent is an entity, then an authorized representative of that entity must complete and sign this Contractor Disclosure and Declaration Form where indicated. <b>If the Respondent is a newly formed entity (formed within the last three years), then an authorized representative of that entity must complete and sign this Contractor Disclosure and Declaration Form where indicated, and each of the members or owners of the entity must also complete and sign separate Contractor Disclosure and Declaration Form where indicated.</b>

***Instructions: Provide the following information for the entity or individual completing this Form (the “Individual/Entity”).***

**A. Basic Information:**

1. Name of Individual/Entity responding to this solicitation:
2. Name of the authorized representative for the responding Entity:

**B. Individual/Entity Information:**

1. Principal Office Address:
2. Telephone and Facsimile Numbers:
3. E-Mail Address:
4. Name and title of Contact Person for the Individual/Entity:
5. Is the Individual/Entity authorized to transact business in the State of Georgia?

☐ **YES** (Attach documentation evidencing authority to transact business in the State of Georgia, not limited to Georgia Secretary of State documentation.)

☐ **NO**

**Required Submittal (FORM 2)**

**Contractor Disclosure and Declaration Form (Page 2 of 8)**

**C. Questionnaire**

If you answer "YES" to any of the following questions, you must provide on a separate page the details necessary to explain the nature and circumstances of each action, event, matter, relationship or practice involved, including but not limited to: names of persons or entities involved, status and/or outcome of each instance. Further, if the matter involves a criminal charge, litigation of any type, or other court or administrative charge or proceeding, then the name of the court or tribunal and the file or reference number must be provided. Any information must be provided on a separate page, attached to this form and submitted with your Bid.

1. Please describe the general development of the Respondent's business during the past ten (10) years, or such shorter period of time that the Respondent has been in business.

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2. Are there any lawsuits, administrative actions or litigation to which Respondent is currently a party or has been a party (either as a plaintiff or defendant) during the past ten (10) years based upon fraud, theft, breach of contract, misrepresentation, safety, wrongful death or other similar conduct? If the answer to this question is "NO", then please proceed to question number 4.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

3. If "yes" to question number 2, were any of the parties to the suit a bonding company, insurance company, an owner, or otherwise? If so, attach a sheet listing all parties and indicate the type of company involved.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

4. Has the Respondent been charged with a criminal offense within the last ten (10) years?

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

5. Has the Respondent received any citations or notices of violation from any government agency in connection with any of Respondent's work during the past ten (10) years (including OSHA violations)? Describe any citation or notices of violation which Respondent received.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

6. Please state whether any of the following events have occurred in the last ten (10) years with respect to the Respondent. If any answer is yes, explain fully the circumstances surrounding the subject matter of the affirmative answer:

(a) Whether Respondent, or Affiliate currently or previously associated with Respondent, has ever filed a petition in bankruptcy, taken any actions with respect to insolvency, reorganization, receivership, moratorium or assignment for the benefit of creditors, or otherwise sought relief from creditors?

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

(b) Whether Respondent was subject of any order, judgment or decree not subsequently reversed, suspended or vacated by any court permanently enjoining Respondent from engaging in any type of business practice?

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>

(c) Whether Respondent was the subject of any civil or criminal proceeding in which there was a final adjudication adverse to Respondent which directly arose from activities conducted by Respondent.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>



**Required Submittal (FORM 2)**  
**Contractor Disclosure and Declaration Form (Page 3 of 8)**

	YES	NO
7. Has any employee, agent or representative of Respondent who is or will be directly involved in the project, in the last ten (10) years:	<input type="checkbox"/>	<input type="checkbox"/>
	YES	NO
(a) directly or indirectly, had a business relationship with the City?	<input type="checkbox"/>	<input type="checkbox"/>
	YES	NO
(b) directly or indirectly, received revenues from the City?	<input type="checkbox"/>	<input type="checkbox"/>
	YES	NO
(c) directly or indirectly, received revenues from conducting business on City property or pursuant to any contract with the City?	<input type="checkbox"/>	<input type="checkbox"/>
	YES	NO
8. Whether any employee, agent, or representative of Respondent who is or will be directly involved in the project has or had within the last ten (10) years a direct or indirect business relationship with any elected or appointed City official or with any City employee?	<input type="checkbox"/>	<input type="checkbox"/>
	YES	NO
9. Whether Respondent has provided employment or compensation to any third party intermediary, agent, or lobbyist to directly or indirectly communicate with any City official or employee, or municipal official or employee in connection with any transaction or investment involving your firm and the City?	<input type="checkbox"/>	<input type="checkbox"/>
	YES	NO
10. Whether Respondent, or any agent, officer, director, or employee of your organization has solicited or made a contribution to any City official or member, or to the political party or political action committee within the previous five (5) years?	<input type="checkbox"/>	<input type="checkbox"/>
	YES	NO
11. Has the Respondent or any agent, officer, director, or employee been terminated, suspended, or debarred (for cause or otherwise) from any work being performed for the City or any other Federal, State or Local Government?	<input type="checkbox"/>	<input type="checkbox"/>
	YES	NO
12. Has the Respondent, member of Respondent's team or officer of any of them (with respect to any matter involving the business practice or activities of his or her employer) been notified within the five (5) years preceding the date of this offer that any of them are the target of a criminal investigation, grand jury investigation, or civil enforcement proceeding?	<input type="checkbox"/>	<input type="checkbox"/>
	YES	NO
13. Please identify any Personal or Financial Relationships that may give rise to a conflict of interest as defined below. [Please be advised that you may be ineligible for award of contract if you have a personal or financial relationship that constitutes a conflict of interest that cannot be avoided]:		
(a) Personal relationships: executives, board members and partners in firms submitting offers must disclose familial relationships with employees, officers and elected officials of the City of Atlanta. Familial relationships shall include spouse, domestic partner registered under Atlanta City Code Section 94-133, mother, father, sister, brother, and natural or adopted children of an official or employee.	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
(b) Financial relationships: Respondent must disclose any interest held with a City employee or official, or family members of a City employee or official, which may yield, directly or indirectly, a monetary or other material benefit to the Respondent or the Respondent's family members. Please describe:	YES	NO
	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>		
<hr/>		
<hr/>		

**Required Submittal (FORM 2)**  
**Contractor Disclosure and Declaration Form (Page 4 of 8)**

**D. REPRESENTATIONS**

Anti-Lobbying Provision. All respondents, including agents, employees, representatives, lobbyists, attorneys and proposed partner(s), subcontractor(s) or joint venturer(s), will refrain, under penalty of the respondent's disqualification, from direct or indirect contact for the purpose of influencing the selection or creating bias in the selection process with any person who may play a part in the selection process.

Certification of Independent Price Determination/Non-Collusion. Collusion and other anticompetitive practices among Bidders are prohibited by city, state and federal laws. All Respondents shall identify a person having authority to sign for the Respondent who shall certify, in writing, as follows:

"I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting an offer for the same supplies, labor, services, construction, materials or equipment to be furnished or professional or consultant services, and is in all respects fair and without collusion or fraud. I understand collusive bidding is a violation of city, state and federal law and can result in fines, prison sentences, and civil damages awards. By signing this document, I agree to abide by all conditions of this solicitation and offer and certify that I am authorized to sign for this Respondent."

**Certify Satisfaction of all Underlying Obligations. (If Applicable)** If a Contract is awarded through this solicitation, then such Contractor should know that before final payment is made to a Contractor by the City, the Contractor shall certify to the City in writing, in a form satisfactory to the City, that all subcontractors, materialmen suppliers and similar firms or persons involved in the City contract have been paid in full at the time of final payment to the Contractor by the City or will be paid in full utilizing the monies constituting final payment to the Contractor.

**Confidentiality.** Details of the Bids/Proposals will not be discussed with other respondents during the selection process. Respondent should be aware, however, that all Bids and information submitted therein may become subject to public inspection following award of the contract. Each Respondent should consider this possibility and, where trade secrets or other proprietary information may be involved, may choose to provide in lieu of such proprietary information, an explanation as to why such information is not provided in its Bid/Proposal. However, the respondent may be required to submit such required information before further consideration.

**Equal Employment Opportunity (EEO) Provision.** All bidders or proponents will be required to comply with sections 2-1200 and 2-1414 of the City of Atlanta Code of Ordinances, as follows: During the performance of the agreement, the Contractor agrees as follows:

- a. The Contractor shall not discriminate against any employee, or applicant for employment, because of race, color, creed, religion, sex, domestic relationship status, parental status, familial status, sexual orientation, national origin, gender identity, age, disability, or political affiliation. As used here, the words "shall not discriminate" shall mean and include without limitation the following:

**Required Submittal (FORM 2)**  
**Contractor Disclosure and Declaration Form (Page 5 of 8)**

Recruited, whether by advertising or other means; compensated, whether in the form of rates of pay, or other forms of compensation; selected for training, including apprenticeship; promoted; upgraded; demoted; downgraded; transferred; laid off; and terminated.

The Contractor agrees to and shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officers setting forth the provisions of the EEO clause.

b. The Contractor shall, in all solicitations or advertisements for employees, placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, creed, religion, sex, domestic relationship status, parental status, familial status, sexual orientation, national origin, gender identity, age, disability, or political affiliation.

c. The Contractor shall send to each labor union or representative of workers with which the Contractor may have a collective bargaining agreement or other contract or understanding a notice advising the labor union or workers' representative of the Contractor's commitments under the equal employment opportunity program of the City of Atlanta and under the Code of Ordinances and shall post copies of the notice in conspicuous places available to employees and applicants for employment. The Contractor shall register all workers in the skilled trades who are below the journeyman level with the U.S. Bureau of Apprenticeship and Training.

d. The Contractor shall furnish all information and reports required by the contract compliance officer pursuant to the Code of Ordinances, and shall permit access to the books, records, and accounts of the Contractor during normal business hours by the contract compliance officer for the purpose of investigation so as to ascertain compliance with the program.

e. The Contractor shall take such action with respect to any subcontractor as the city may direct as a means of enforcing the provisions of paragraphs (a) through (h) herein, including penalties and sanctions for noncompliance; provided, however, that in the event the Contractor becomes involved in or is threatened with litigation as a result of such direction by the city, the city will enter into such litigation as is necessary to protect the interest of the city and to effectuate the equal employment opportunity program of the city; and, in the case of contracts receiving federal assistance, the Contractor or the city may request the United States to enter into such litigation to protect the interests of the United States.

f. The Contractor and its subcontractors, if any, shall file compliance reports at reasonable times and intervals with the city in the form and to the extent prescribed by the contract compliance officer. Compliance reports filed at such times directed shall contain information as to employment practices, policies, programs and statistics of the Contractor and its subcontractors.

g. The Contractor shall include the provisions of paragraphs (a) through (h) of this equal employment opportunity clause in every subcontract or purchase order so that such provisions will be binding upon each subcontractor or vendor.

**Required Submittal (FORM 2)**  
**Contractor Disclosure and Declaration Form (Page 6 of 8)**

h. A finding, as hereinafter provided, that a refusal by the Contractor or subcontractor to comply with any portion of this program, as herein provided and described, may subject the offending party to any or all of the following penalties:

(1) Withholding from the Contractor in violation all future payments under the involved contract until it is determined that the Contractor or subcontractor is in compliance with the provisions of the contract;

(2) Refusal of all future bids for any contract with the City of Atlanta or any of its departments or divisions until such time as the Contractor or subcontractor demonstrates that there has been established and there shall be carried out all of the provisions of the program as provided in the Code of Ordinances;

(3) Cancellation of the public contract; and

(4) In a case in which there is substantial or material violation of the compliance procedure herein set forth or as may be provided for by the contract, appropriate proceedings may be brought to enforce those provisions, including the enjoining, within applicable law, of Contractors, subcontractors or other organizations, individuals or groups who prevent or seek to prevent directly or indirectly compliance with the policy as herein provided.

**Prohibition on Kickbacks or Gratuities/Non-Gratuity.** The undersigned acknowledges the following prohibitions on kickbacks and gratuities:

a. It is unethical for any person to offer, give or agree to give any employee or former employee a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation or any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy or other particular matter pertaining to any program requirement or a contract or subcontract or to any solicitation or Bid therefor.

b. It is unethical for any employee or former employee to solicit, demand, accept or agree to accept from another person a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation or any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy or other particular matter pertaining to any program requirement or a contract or subcontract or to any solicitation or Bid therefor.

c. It is also unethical for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime Contractor or higher tier subcontractor or any person associated therewith as an inducement for the award of a subcontract or order.

**Required Submittal (FORM 2)**  
**Contractor Disclosure and Declaration Form (Page 7 of 8)**

**Declaration**

Under penalty of perjury, I declare that I have examined this Contractor Disclosure and Declaration Form and all attachments to it, if applicable, and, to the best of my knowledge and belief all statements contained herein and in any attachments, if applicable, are true, correct and complete.

I certify that this offer is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting an offer for the same supplies, services, construction, or professional or consultant services, and is in all respects fair and without collusion or fraud. I understand collusive bidding is a violation of city, state and federal law and can result in fines, prison sentences, and civil damages awards. I agree to abide by all conditions of this solicitation and offer and certify that I am authorized to sign for this Respondent.

*Sign here if you are an individual:*

**Printed Name:** \_\_\_\_\_

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_, 20\_\_

**Subscribed and sworn to or affirmed by** \_\_\_\_\_ **(name) this** \_\_\_\_ **day of** \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public of \_\_\_\_\_ (state)

My commission expires: \_\_\_\_\_

---

*Sign here if you are an authorized representative of a responding entity or partnership:*

**Printed Name of Entity or Partnership:** \_\_\_\_\_

**Signature of authorized representative:** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Date:** \_\_\_\_\_, 20\_\_

**Subscribed and sworn to or affirmed by** \_\_\_\_\_ **(name), as the**  
\_\_\_\_\_  
**(title) of** \_\_\_\_\_ **(entity or partnership name)**  
**this** \_\_\_\_ **day of** \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Notary Public of \_\_\_\_\_ (state)

My commission expires: \_\_\_\_\_

**Required Submittal (FORM 2)**  
**Contractor Disclosure and Declaration Form (Page 8 of 8)**

FOR INTERNAL USE ONLY

**Project Name/Number:** FC/BID- \_\_\_\_\_

**Proponent:** \_\_\_\_\_

This is to acknowledge that this Contractor Disclosure and Declaration Form has been reviewed and appropriate actions have been taken in accordance with City of Atlanta Procurement Code Section 2-1214 and Department of Procurement procedures.

\_\_\_\_\_  
Print Name of Procurement Professional

\_\_\_\_\_  
Print Title of Procurement Professional

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
Print Name of Chief Procurement Officer

\_\_\_\_\_  
Signature of Chief Procurement Officer

\_\_\_\_\_  
Date

**Required Submittal (FORM 3)**

**Required Submittal "Unless a Bidder Elects to Submit an Alternative Form of Payment"**

**Bid Bond (Page 1 of 2)**

KNOW ALL MEN BY THESE PRESENTS, THAT WE \_\_\_\_\_

hereinafter called the PRINCIPAL, and \_\_\_\_\_

hereinafter called the SURETY, a corporation chartered and existing under the laws of the State of \_\_\_\_\_, and duly authorized to transact Surety business in the State of Georgia, are held and firmly bound unto the City of Atlanta, Georgia, in the penal sum of either: [i] \_\_\_\_\_ Dollars and Cents (\$ \_\_\_\_\_); or [ii] 5% of PRINCIPAL'S Bid amount for **PROJECT NUMBER FC-10337; Terrell Creek Trunk System Sewer Improvements** good and lawful money of the United States of America, to be paid upon demand of the City of Atlanta, Georgia, to which payment well and truly to be made we bind ourselves, our heirs, executors, administrators and assigns, jointly and severally and firmly by these presents.

WHEREAS the PRINCIPAL has submitted to the City of Atlanta, Georgia, for **PROJECT NUMBER FC-10337; Terrell Creek Trunk System Sewer Improvements** a Bid;

WHEREAS the PRINCIPAL desires to file this Bond in accordance with law, in lieu of a certified Bidder's check otherwise required to accompany this Bid;

NOW THEREFORE: The conditions of this obligation are such that if the Bid be accepted, the PRINCIPAL shall within ten (10) calendar days after receipt of written notification from the CITY of the award of the Contract execute a Contract in accordance with the Bid and upon the terms, conditions and prices set forth therein, in the form and manner required by the City of Atlanta, Georgia, and execute sufficient and satisfactory Performance and Payment Bonds payable to the City of Atlanta, Georgia, each in the amount of one hundred percent (100%) of the total Contract price in form and with security satisfactory to said City of Atlanta, Georgia, then this obligation to be void; otherwise, to be and remain in full force and virtue in law; and the SURETY shall upon failure of the PRINCIPAL to comply with any or all of the foregoing requirements within the time specified above immediately pay to the City of Atlanta, Georgia, upon demand the amount hereof in good and lawful money of the United States of America, not as a penalty but as liquidated damages.

In the event suit is brought upon this Bond by the CITY and judgment is recovered, the SURETY shall pay all costs incurred by the CITY in such suit, including attorney's fees to be fixed by the Court.

**Required Submittal "Unless a Bidder Elects to Submit an Alternative Form of Payment"**  
**(FORM 3)**

**Bid Bond (Page 2 of 2)**

Enclosed is a Bid Bond in the approved form, in the amount of either:

[i] \_\_\_\_\_ Dollars and Cents  
(\$ \_\_\_\_\_), being in the amount of 5% of the CONTRACT Sum; or  
[ii] 5% of PRINCIPAL'S Bid amount for **PROJECT NUMBER FC-10337; Terrell Creek Trunk System Sewer Improvements**. The money payable on this bond shall be paid to the City of Atlanta, Georgia, for the failure of the Bidder to execute a CONTRACT within ten (10) days after receipt of the Contract form and at the same time furnish a Payment Bond and Performance Bond.

IN TESTIMONY THEREOF, the PRINCIPAL and SURETY have caused these presents to be duly signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_.

**Corporate Bidder:**  
**[Insert Corporate Name]**

\_\_\_\_\_  
**By:** \_\_\_\_\_  
**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_

\_\_\_\_\_  
**Corporate Secretary/Assistant**  
**Secretary (Seal)**

**Non-Corporate Bidder:**  
**[Insert Bidder Name]**

\_\_\_\_\_  
**By:** \_\_\_\_\_  
**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_

\_\_\_\_\_  
**Notary Public (Seal)**

**My Commission Expires:** \_\_\_\_\_

**Surety:**  
**Name:** \_\_\_\_\_  
**By:** \_\_\_\_\_  
**Name:** \_\_\_\_\_  
**Title:** \_\_\_\_\_



**Required Submittal (FORM 4.1)**

**Certification of Insurance Ability Instructions:**

Offerors **MUST** submit a **completed copy of this form executed by their insurance company**.  
Failure to submit completed form will result in the Offeror being deemed non-responsive.

I, \_\_\_\_\_ [*insert an individual's name*], on behalf of \_\_\_\_\_  
[*insert insurance company full name*], a \_\_\_\_\_ [*insert type of entity LLC, LLP, corporation, etc.*](**"Insurer"**), hereby represent and certify each of the following to the City of Atlanta, a municipal corporation of the State of Georgia (**"City"**) on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ [*insert date*]:

- (a) Insurer is licensed by the Insurance and Safety Fire Commissioner of the State of Georgia to transact insurance business in the State of Georgia;
- (b) Insurer has reviewed the Agreement attached to the solicitation for Project Number **FC-10337; Terrell Creek Trunk System Sewer Improvements ("Project")** and its corresponding **Appendix for Insurance Requirements**;
- (c) Insurer certifies that if, as of the date written above, (**"Offeror"**) was selected as the successful Offeror for the Project, Insurer would provide insurance to Offeror for this Project in accordance with the terms set forth in the corresponding **Appendix for Insurance Requirements**; and

**PLEASE NOTE: If this Form 4.1 is executed by an Attorney-in-Fact, then Insurer must attach a copy of a duly executed Power-of-Attorney evidencing such authority in addition to correctly completing this Form 4.1. If Offeror is unable to provide City with insurance that comply with the terms of the corresponding Appendix for Insurance Requirements within ten (10) days of receiving notice of intent to award the Project from the City, the City may, in its sole discretion, retain Offeror's security submitted with its offer and/or disqualify Offeror from further consideration for the award of the Agreement.**

By executing this certification, Insurer represents that all of the information provided by Insurer herein is true and correct as of the date set forth above.

**Insurer:** [*insert company name on line provided below*]

\_\_\_\_\_

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_  
Corporate Secretary/Assistant Secretary  
(Seal)

**Required Submittal (FORM 4.2)**

**Certification of Bonding Ability Instructions:**

Offerors **MUST** submit a **completed copy of this form executed by their surety**. Failure to submit completed form from will result in the Offeror being deemed non-responsive.

I, \_\_\_\_\_ [*insert an individual's name*], on behalf of \_\_\_\_\_ [*insert surety company full name*], a \_\_\_\_\_ [*insert type of entity LLC, LLP, corporation, etc.*] ("**Surety**"), hereby represent and certify each of the following to the City of Atlanta, a municipal corporation of the State of Georgia ("**City**") on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ [*insert date*]:

- (a) Surety is licensed by the Insurance and Safety Fire Commissioner of the State of Georgia to transact surety business in the State of Georgia;
- (b) Surety has reviewed the Agreement attached to the solicitation for Project Number **FC-10337; Terrell Creek Trunk System Sewer Improvements** ("Project") and its corresponding **Appendix for Insurance Requirements**;
- (c) Surety certifies that if, as of the date written above, \_\_\_\_\_ ("**Offeror**") was selected as the successful Offeror for the Project, Surety would provide bonding to Offeror for this Project in accordance with the corresponding **Appendix for Insurance Requirements**; and
- (d) **Surety only:** The Surety states that Offeror's uncommitted bonding capacity (not taking into account this Project) is approximately \$ \_\_\_\_\_ (U.S.). Surety's statement set forth in this Section (d) does not represent a limitation of the bonding capacity of Offeror or that Offeror will have the bonding capacity noted above at the time of contract execution for this Project.

**PLEASE NOTE: If this Form 4.2 is executed by an Attorney-in-Fact, then Surety must attach a copy of a duly executed Power-of-Attorney evidencing such authority in addition to correctly completing this Form 4.2. If Offeror is unable to provide City with bonds that comply with the terms of the corresponding Appendix for Insurance Requirements within ten (10) days of receiving notice of intent to award the Project from the City, the City may, in its sole discretion, retain Offeror's security submitted with its offer and/or disqualify Offeror from further consideration for the award of the Agreement.**

By executing this certification, Surety represents that all of the information provided by Surety herein is true and correct as of the date set forth above.

**Surety:** [*insert company name on line provided below*]

\_\_\_\_\_

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_  
Corporate Secretary/Assistant Secretary  
(Seal)

**Required Submittal (FORM 5)**

**Acknowledgment of Addenda**

Bidders should sign below and return this form with their Bid(s) to the Department of Procurement, 55 Trinity Avenue, City Hall South, Suite 1900, Atlanta, Georgia 30303, as acknowledgment of receipt of certain Addenda.

This is to acknowledge receipt of the following **Addenda** for **FC-10337; Terrell Creek Trunk System Sewer Improvements:**

1. \_\_\_\_\_;
2. \_\_\_\_\_;
3. \_\_\_\_\_; and
4. \_\_\_\_\_.

Dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

Corporate Bidder:

[Insert Corporate Name]

\_\_\_\_\_

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_

Corporate Secretary/Assistant  
Secretary (Seal)

Non-Corporate Bidder:

[Insert Bidder Name]

\_\_\_\_\_

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_

Notary Public (Seal)  
My Commission Expires: \_\_\_\_\_

**Required Submittal (FORM 6)**

**Bidder Contact Directory**<sup>1</sup>

NAME	POSITION/TITLE	MAILING ADDRESS	OFFICE PHONE	CELL PHONE	EMAIL ADDRESS AND FAX NUMBER

---

<sup>1</sup> The purpose of the Bidder Contact Directory is to provide the City with a centralized, easily identified source of important contacts and other information regarding each of the business entities constituting a Bidder. This Bidder Contact Directory should include the names, positions/titles, firms, mailing addresses, phone and fax numbers and e-mail addresses for each of the following as it pertains to each of the firms in a Bidder's team:

1. At least two individuals, one primary the other(s) secondary, authorized to represent the firm for purposes of this ITB; and
2. Bidder Service Provider Key Personnel (as appropriate) listed in the Services Agreement included in this ITB at Part 5.

**Required Submittal (FORM 7)**

**Reference List**

Each Bidder must provide a list of at least three (3) references using the below-referenced format. The City is interested in reviewing references that are able to attest to a Bidder's performance ability and credibility in a particular industry or trade.

Reference:               Name  
                                  Address  
                                  City, State, Zip  
                                  Phone  
                                  Fax

Project Title:

Contact Person: \_\_\_\_\_  
Direct Telephone: \_\_\_\_\_  
Email Address: \_\_\_\_\_

Date(s) of Project: \_\_\_\_\_

Description of Services:

Total Amount of Contract Including Change Orders:

Bidder's Role and Responsibilities:

Current Completion Status:

---

*(Use the Same Format to Provide the Additional References)*

### **Submittal Checklist**

**The following submittals shall be completed and submitted with each Bid see table below “Required Bid Submittal Check Sheet.” Please verify that these submittals are in the envelope before it is sealed. Disclaimer: It is each Bidders sole responsibility to ensure that their Bid to the City is inclusive of all required submittal documents outlined on the below- referenced checklist; as well as within other parts of the solicitation document.**

**Submit one (1) Original Bid, signed and dated, and seven (7) complete copies of the Original Bid including all required attachments.**

**In addition to the hard copy submissions, each Bidder shall submit two (2) digital versions of its Bid Submission in Adobe Portable Document Format (“PDF”) on compact disk (CDs). CD One (1) version should be a duplicate of the hard copy of the Bid with no deviations in order or layout of the hard copy Bid. CD Two (2) version should be a redacted version of the hard copy Bid Submission. Please refer to the Georgia Open Records Acts (O.C.G.A. § 50-18-72) for information not subject to public disclosure.**

**The City assumes no liability for differences in information contained in the Bidder’s printed Bid Submission and that contained on the CDs. In the event of a discrepancy, the City will rely upon the information contained in the Bidder’s printed material (Hard Copy). Each CD should be labeled with the Project Number, Project Name, and the CD Number.**

Item Number	Bidder Submittal Check Sheet	Check
1	Part I, Section 1- Instruction to Bidders (Bid Guarantee Included)	<input type="checkbox"/>
2	Appendix A- Office of Contract Compliance (Required Submittals Forms)	<input type="checkbox"/>
3	<p><b>Part I, Section 2– All Required Procurement Documents (if any of the required submittal documents are not submitted or incomplete within your Bid submittal package, your firm may be deemed non-responsive).</b></p> <p><u>Required Submittals include but are not limited to:</u></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Form 1; Illegal Immigration Reform and Enforcement Act</li> <li><input type="checkbox"/> Form 2; Contractor Disclosure and Declaration Form</li> <li><input type="checkbox"/> Form 3; Bid Bond</li> <li><input type="checkbox"/> Form 4.1; Certification of Insurance Ability</li> <li><input type="checkbox"/> Form 4.2; Certification of Bonding Ability</li> <li><input type="checkbox"/> Form 5; Acknowledgement of Addenda</li> <li><input type="checkbox"/> Form 6; Bidder Contact Directory</li> <li><input type="checkbox"/> Form 7; Reference List</li> <li><input type="checkbox"/> Submittal Checklist</li> <li><input type="checkbox"/> Authority to Transact Business in the State of Georgia</li> <li><input type="checkbox"/> Georgia Utilities Licenses</li> </ul>	
4	<p><b>Bidder's Official Company Name:</b> _____</p> <p><b>Company Physical Address:</b> _____</p> <p>_____</p> <p>_____</p>	
5	<p><b>President/Vice President/Owner Name:</b> _____</p> <p><b>Title:</b> _____</p> <p><b>Office Telephone Number:</b> _____</p> <p><b>Direct Cell Telephone Number:</b> _____</p> <p><b>Email Address:</b> _____</p>	
6	<p><b>Primary Point-of-Contact Concerning ITB:</b> _____</p> <p><b>Title:</b> _____</p> <p><b>Office Telephone Number:</b> _____</p> <p><b>Direct Cell Telephone Number:</b> _____</p> <p><b>Email Address:</b> _____</p>	

**Required Submittal**

**AUTHORITY TO TRANSACT BUSINESS IN GEORGIA**

**FC-10337, Terrell Creek Trunk System Sewer Improvements**

***Copy of authorization must be included in Bid***



## **STATEMENT OF BIDDER'S QUALIFICATIONS**

This Statement is to accompany bids submitted for the following project: **FC- 10337; Terrell Creek Trunk System Sewer Improvements**. Bidders must meet the minimum qualification criteria set forth under items 5, 7, 8, 9, 10 and 11 of this section, must provide the organization chart as set forth under item 6 of this section and must complete the project experience forms for qualifying projects to be deemed a "Responsible and Responsive Bidder".

1. NAME OF BIDDER: \_\_\_\_\_

2. BUSINESS ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

3. TELEPHONE NUMBER: \_\_\_\_\_

4. OFFICIAL REPRESENTATIVE AND TITLE: \_\_\_\_\_  
\_\_\_\_\_

5. Using the forms provided in this Section, list previously completed or current projects which are similar in scope and complexity to this project which were completed or assigned to your firm or joint venture, including: Name of project, location of project, owner's name, address and phone number, description of work performed, initial contract amount, final contract amount, start date, scheduled completion date and actual completion date. (If a joint venture, list separately for each joint venture partner.) Limit to 5.

- a. Contractor must have successfully completed the following work within the last five years in the United States of America: Replacement of not less than 20,000 linear feet of sewers with new Ductile Iron pipe, and 5,000 linear feet of sewer with new Ductile Iron, Polycrrete, and/or HDPE piping using Jack and Bore method, including all same size replacement and size increase or upsize replacement of existing sewers up to 36-inch diameter, and construction of not less than 20 external point repairs on sanitary sewers of at least 18-inches to 36-inches in diameter, and/or successful experience of at least 12 months on a Clean Water Atlanta Rehabilitation Program contract. The aggregate construction value of this work must not be less than \$10,000,000. These requirements may be satisfied by the prime contractor or by a combination of prime and subcontractor experience.

6. Provide the following information for the organization proposed for this project:

- a. Organizational chart.
  - b. Indicate the participation by the various members in the organization, as shown on the organizational chart; in the management; and in the division of work (If a joint venture, indicate percent of man hours and percent of project cost to be performed by each joint venture member).
7. Using the forms provided in this Section, provide information for key project personnel, Project Manager, Project Superintendent, Project Engineer, Safety Engineer, and Project Controls Scheduler Engineer.
- a. Project Manager must have successfully managed the following work within the last five years in the United States of America: Construction of not less than 10,000 linear feet of pipe, construction of not less than 5,000 linear feet of open cut sewer of not less than 18-inches in diameter, and construction of not less than 20 external point repairs on sanitary sewers of at least 18-inches in diameter, or successful equivalent experience of at least 12 months on a Clean Water Atlanta Rehabilitation Program contract. In addition, the Project Manager should have a thorough knowledge of sewer cleaning, sewer line foam treatment, and sewer inspection utilizing CCTV/Sonar inspection techniques.
  - b. Project Superintendent must have successfully managed the following work within the last five years in the United States of America: Construction of not less than 10,000 linear feet of pipe, construction of not less than 5,000 linear feet of open cut sewer of not less than 18-inches in diameter, and construction of not less than 20 external point repairs on sanitary sewers of at least 18-inches in diameter, or successful equivalent experience of at least 12 months on a Clean Water Atlanta Rehabilitation Program contract. In addition, the Project Superintendent should be fully competent in sewer cleaning, sewer line foam treatment, and sewer inspection utilizing CCTV/Sonar inspection techniques.
  - c. Project Engineer must have worked on at least three (3) contracts involving construction of pipe projects of similar size and complexity as this project.
  - d. Safety Engineer must have worked on at least five (5) contracts involving construction of pipe projects of similar size and complexity as this project.
  - e. Project Controls Scheduler Engineer must have worked on at least five (5) contracts involving construction of Pipe projects of similar size and complexity as this project.
8. The Contractor must have an established Safety Program that as a minimum includes those items as listed on the attachment entitled “*CONTRACTOR SAFETY RECORD FORM*”.
9. The Contractor’s Workman’s Compensation Ratings (EMR-Experience Modification Rate)

must not exceed an average of 1.0 over the last three (3) years.

- a. Contractor's Workman's Compensation Ratings (EMR-Experience Modification Rate) \_\_\_\_\_
10. The Contractor's OSHA Incidence Rates must not exceed the Industry Standard published by the U.S. Department of Labor(2002) (i.e.-Recordable Incidence Rates of 6.2 and Loss Time Incidence Rates of 2.4 per OSHA definition and calculation) for the last three (3) years.
  - a. Contractor's Recordable Incidence Rates \_\_\_\_\_
  - b. Contractor's Lost Time Incidence Rates \_\_\_\_\_
11. "If there have been any fatalities during the last five (5) years on any projects performed by the Contractor or on any work performed under the direct supervision of a proposed Project Manager and the Contractor or proposed Project Manager was cited by OSHA for "Willful", in performing the work in which the fatality occurred, the Contractor will be disqualified based on the City's review. The Contractor may also be disqualified in the event that a Recordable Incident occurred due to the same condition that existed when a previous fatality occurred and resulted in an OSHA citation or failure to implement a corrective action plan."
  - a. Fatalities during the last five years where Contractor was cited by OSHA for "Willful" Violation \_\_\_\_\_
  - b. Fatalities during the last five years where the proposed Project Manager was cited by OSHA for "Willful" Violation.  
\_\_\_\_\_

The previous statements and attachments are true, correct, and complete to the best of my knowledge.

Date: \_\_\_\_\_

Firm Name: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Sworn to and subscribed before me

this \_\_\_\_ day of \_\_\_\_\_, 201\_.

Notary Public

**STATEMENT OF BIDDER'S QUALIFICATIONS**  
**COMPANY PROJECT EXPERIENCE**  
 (Complete Form Only For Projects That Meet Minimum Criteria)

Project Name	
Project Location	
Contractor's Project Manager	
Contractor's Project Superintendent	
Owners Representative & Phone Number	
Design Engineer Representative Name & Phone Number	
Cured-In-Place Pipe, LF	
Open Cut Sewer Installation, LF	
Pipe-bursting Replacement, LF	
External Sewer Point Repairs, No.	
Initial Contract Amount	\$
Final Contract Amount	\$
Project Duration	Date Started: Date Completed: Time Extensions:
Was Project Completed on Time?	
Description of Major Project Components	

**STATEMENT OF BIDDER'S QUALIFICATIONS**  
**PROJECT MANAGER EXPERIENCE**  
 (Complete Form Only For Projects That Meet Minimum Criteria)

Project Name	
Project Location	
Contractor's Project Manager	
Owners Representative & Phone Number	
Design Engineer Representative Name & Phone Number	
Cured-in-Place Pipe, LF	
Open Cut Sewer Installation, LF	
External Sewer Point Repairs, No.	
Initial Contract Amount	\$
Final Contract Amount	\$
Project Duration	Date Started: Date Completed: Time Extensions:
Was Project Completed on Time?	
Description of Major Project Components	

**STATEMENT OF BIDDER'S QUALIFICATIONS**  
**PROJECT SUPERINTENDENT'S PROJECT EXPERIENCE**  
 (Complete Form Only For Projects That Meet Minimum Criteria)

Project Name	
Project Location	
Contractor's Project Superintendent	
Owners Representative & Phone Number	
Design Engineer Representative Name & Phone Number	
Cured-In-Place Pipe, LF	
Open Cut Sewer Installation, LF	
External Sewer Point Repairs, No.	
Initial Contract Amount	\$
Final Contract Amount	\$
Project Duration	Date Started: Date Completed: Time Extensions:
Was Project Completed on Time?	
Description of Major Project Components	

**STATEMENT OF BIDDER'S QUALIFICATIONS**  
**KEY STAFF PROJECT EXPERIENCE**  
 (Complete Form Only For Projects That Meet Minimum Criteria)

Project Name	
Project Location	
Contractor's Safety Engineer	
Owners Representative & Phone Number	
Design Engineer Representative Name & Phone Number	
Cured-In-Place Pipe, LF	
Open Cut Sewer Installation, LF	
External Sewer Point Repairs, No.	
Initial Contract Amount	\$
Final Contract Amount	\$
Project Duration	Date Started: Date Completed: Time Extensions:
Was Project Completed on Time?	
Description of Major Project Components	

**STATEMENT OF BIDDER'S QUALIFICATIONS**  
**KEY STAFF PROJECT EXPERIENCE**  
 (Complete Form Only For Projects That Meet Minimum Criteria)

Project Name	
Project Location	
Contractor's Project Engineer	
Owners Representative & Phone Number	
Design Engineer Representative Name & Phone Number	
Cured-In-Place Pipe, LF	
Open Cut Sewer Installation, LF	
External Sewer Point Repairs, No.	
Initial Contract Amount	\$
Final Contract Amount	\$
Project Duration	Date Started: Date Completed: Time Extensions:
Was Project Completed on Time?	
Description of Major Project Components	



**STATEMENT OF BIDDER'S QUALIFICATIONS**  
**KEY STAFF PROJECT EXPERIENCE**  
 (Complete Form Only For Projects That Meet Minimum Criteria)

Project Name	
Project Location	
Contractor's Project Controls Scheduler Engineer	
Owners Representative & Phone Number	
Design Engineer Representative Name & Phone Number	
Cured-In-Place Pipe, LF	
Open Cut Sewer Installation, LF	
External Sewer Point Repairs, No.	
Initial Contract Amount	\$
Final Contract Amount	\$
Project Duration	Date Started: Date Completed: Time Extensions:
Was Project Completed on Time?	
Description of Major Project Components	

## I. General Information

Name of Firm:	
Business Address:	
Telephone:	Fax:
Prepared by/Title:	Date prepared:

## II. Experience Modification Rates

- A. List your firm's Workers Compensation Experience Modification Rates (EMR) for the last three years.

Year	Experience Modification Rate (EMR)

## III. OSHA Incidence Rates

- A. List your firm's Occupational Safety Health Administration (OSHA) incidence rates for the last three years.

Year	Total Recordable Incidents	Total Hours Worked	OSHA Incidence Rate*

\* Use your OSHA Form No. 200 and the formula:

$(\text{Total Incidents} \times 200,000 \text{ hours}) \div (\text{Number of hours worked}) = \text{Incidence Rate}$

### III. OSHA Incidence Rates (cont'd)

B. Provide your incidence rates over the last three years for the following categories:

Category	Incidence Rate by Year*		
	Year _____	Year _____	Year _____
Fatalities			
Injuries and Illnesses with Lost Work Days			
Injuries and Illnesses with Restricted Work Days			

\* Use your OSHA Form No. 200 and the formula:

$$(\text{Total Incidents} \times 200,000 \text{ hours}) \div (\text{Number of hours worked}) = \text{Incidence Rate}$$

C. Does your firm have any upheld OSHA citations in the past five years?

Yes ☐ No ☐ (If yes, attach explanation)

### IV. Safety Program Information

A. Do you have a written safety program?

Yes ☐ No ☐ (If yes, attach outline)

B. Which of the following does your safety program contain:

1. Does your company require health and safety training of its subcontractors?

Yes ☐ No ☐

2. Is documentation of health and safety training required?

Yes ☐ No ☐

3. Do you have a Hazard Communication Program (29 CFR 1910.1200, CCR Title 8 Section 5194)?

Yes ☐ No ☐

4. Do you have a Confined Space Entry and Rescue Program (29 CFR 1910.146, CCR Title 8 Section 5156-5159)?

Yes ☐ No ☐ (If yes, attach explanation)

5. Do you have a "Hot Work" permit program (29 CFR 1910.146, CCR Title 8 5156-5159)?

Yes ☐ No ☐ (If yes, attach explanation)

### IV. Safety Program Information (cont'd)

B. Which of the following does your safety program contain (cont'd):

6. Do you have a "Lock-Out/Tag-Out" program (29 CFR 1910.417)?

Yes ☐ No ☐ (If yes, attach explanation)

*C. Do you have an Equipment Maintenance Program for the following:*

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| 1. Miscellaneous construction tools and equipment? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2. Ladders?  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 3. Scaffolds?                                      | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 4. Heavy Equipment?                                | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 5. Vehicles?                                       | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

*D. Do you have a new employee safety orientation program?*

Yes ☐ No ☐

1. If yes, does it include instruction in the following:

- |                                   |                              |                             |
|-----------------------------------|------------------------------|-----------------------------|
| (a) Company Safety Policy         | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (b) Company Safety Rules          | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (c) Safety Meeting Attendance     | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (d) Company Safety Record         | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (e) Hazard Recognition            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (f) Hazard Reporting              | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (g) Injury Reporting              | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (h) Non-Injury Accident Reporting | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (i) Personal Protective Equipment | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (j) Respiratory Protection        | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (k) Fire Protection               | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (l) Housekeeping                  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (m) Toxic Substance               | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (n) Electrical Safety             | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (o) Fall Protection               | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (p) First-Aid/CPR                 | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (q) Driving Safety                | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (r) Hearing Conservation          | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (s) Lock-Out/Tag-Out              | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (t) Bloodborne Pathogens          | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (u) Asbestos                      | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (v) Confined Spaces               | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (w) Hazard Communication          | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

#### IV. Safety Program Information (cont'd)

E. Do you conduct safety meetings for your employees? Yes ☐ No ☐

1. If yes, how often:

Daily ☐ Weekly ☐ Bi-weekly ☐ Monthly ☐ As Needed ☐

F. Do you conduct health and safety audits of work in progress?

Yes ☐ No ☐

1. If yes, who conducts the audits?

---

2. How often are the audits conducted?

---

G. Do you notify all employees of accidents and precautions related to accidents and near misses?

Yes ☐ No ☐

1. If yes, how is this notification accomplished?

(a) Safety meetings	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(b) Post notification in office	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(c) Post notification at the site where the incident occurred	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(d) Other _____		

H. Is safety a criteria in evaluating the performance of:

1. Employees	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2. Supervisors	Yes <input type="checkbox"/>	No <input type="checkbox"/>
3. Management	Yes <input type="checkbox"/>	No <input type="checkbox"/>

I. Does your firm hold "tailgate" safety meetings? Yes ☐ No ☐

1. If yes, how often:

Daily ☐ Weekly ☐ Bi-weekly ☐ Monthly ☐ As Needed ☐

J. Does your company have a drug and alcohol testing policy?

Yes ☐ No ☐

K. Does your company require that subcontractors participate in a drug surveillance/testing program?

Yes ☐ No ☐

L. Does your company have a method of disseminating safety information?

Yes ☐ No ☐

## SAFETY RECORD FORM

### I. General Information

Name of Firm:	
Business Address:	
Telephone:	Fax:
Prepared by/Title:	Date prepared:

### II. Experience Modification Rates

- A. List your firm's Workers Compensation Experience Modification Rates (EMR) for the last three years.

Year	Experience Modification Rate (EMR)

### III. OSHA Incidence Rates

- A. List your firm's Occupational Safety Health Administration (OSHA) total recordable incidence rates for the last three years.

Year	Total Recordable Incidents	Total Hours Worked	OSHA Incidence Rate*

\* Use your OSHA Form No. 200 and the formula:

$(\text{Total Incidents} \times 200,000 \text{ hours}) \div (\text{Number of hours worked}) = \text{Incidence Rate}$

## SAFETY RECORD FORM

### III. OSHA Incidence Rates (cont'd)

B. Provide your incidence rates over the last three years for the following categories:

Category	Incidence Rate by Year*		
	Year _____	Year _____	Year _____
Injuries and Illness with Lost Work Days			
Injuries and Illness with Job Transfer or Restricted Work Days			

\* Use your OSHA Form No. 200 and the formula:

$(\text{Total Incidents} \times 200,000 \text{ hours}) \div (\text{Number of hours worked}) = \text{Incidence Rate}$

C. Provide your incidences of fatality over the last five years:

Category	Fatalities by Year				
	Year _____	Year _____	Year _____	Year _____	Year _____
Number of Fatalities					

D. Does your firm have any upheld OSHA citations in the past five years?

Yes ☐ No ☐ (If yes, attach explanation)

### IV. Safety Program Information

A. Do you have a written safety program?

Yes ☐ No ☐ (If yes, attach outline)

B. Which of the following does your safety program contain:

1. Does your company require health and safety training of its subcontractors?

Yes ☐ No ☐

2. Is documentation of health and safety training required?

Yes ☐ No ☐

3. Do you have a Hazard Communication Program (29 CFR 1910.1200, CCR Title 8 Section 5194)?

Yes ☐ No ☐

4. Do you have a Confined Space Entry and Rescue Program (29 CFR 1910.146, CCR Title 8 Section 5156-5159)?

## SAFETY RECORD FORM

Yes ☐ No ☐ (If yes, attach explanation)

5. Do you have a "Hot Work" permit program (29 CFR 1910.146, CCR Title 8 5156-5159)?

Yes ☐ No ☐ (If yes, attach explanation)

6. Do you have a "Lock-Out/Tag-Out" program (29 CFR 1910.417)?

Yes ☐ No ☐ (If yes, attach explanation)

*C. Do you have an Equipment Maintenance Program for the following:*

- |  |                              |                             |
|--|------------------------------|-----------------------------|
| 1. Miscellaneous construction tools and equipment? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 2. Ladders?  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 3. Scaffolds?                                      | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 4. Heavy Equipment?                                | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| 5. Vehicles?                                       | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

*D. Do you have a new employee safety orientation program?*

Yes ☐ No ☐

1. If yes, does it include instruction in the following:

- |                                   |                              |                             |
|-----------------------------------|------------------------------|-----------------------------|
| (a) Company Safety Policy         | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (b) Company Safety Rules          | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (c) Safety Meeting Attendance     | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (d) Company Safety Record         | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (e) Hazard Recognition            | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (f) Hazard Reporting              | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (g) Injury Reporting              | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (h) Non-Injury Accident Reporting | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (i) Personal Protective Equipment | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (j) Respiratory Protection        | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (k) Fire Protection               | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (l) Housekeeping                  | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (m) Toxic Substance               | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (n) Electrical Safety             | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (o) Fall Protection               | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (p) First-Aid/CPR                 | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (q) Driving Safety                | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (r) Hearing Conservation          | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (s) Lock-Out/Tag-Out              | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (t) Bloodborne Pathogens          | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (u) Asbestos                      | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (v) Confined Spaces               | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (w) Hazard Communication          | Yes <input type="checkbox"/> | No <input type="checkbox"/> |



## SAFETY RECORD FORM

### IV. Safety Program Information (cont'd)

E. Do you conduct safety meetings for your employees? Yes ☐ No ☐

1. If yes, how often:

Daily ☐ Weekly ☐ Bi-weekly ☐ Monthly ☐ As Needed ☐

F. Do you conduct health and safety audits of work in progress?

Yes ☐ No ☐

1. If yes, who conducts the audits?

\_\_\_\_\_

2. How often are the audits conducted?

\_\_\_\_\_

G. Do you notify all employees of accidents and precautions related to accidents and near misses?

Yes ☐ No ☐

1. If yes, how is this notification accomplished?

(a) Safety meetings	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(b) Post notification in office	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(c) Post notification at the site where the incident occurred	Yes <input type="checkbox"/>	No <input type="checkbox"/>
(d) Other _____		

H. Is safety a criteria in evaluating the performance of:

1. Employees	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2. Supervisors	Yes <input type="checkbox"/>	No <input type="checkbox"/>
3. Management	Yes <input type="checkbox"/>	No <input type="checkbox"/>

I. Does your firm hold "tailgate" safety meetings? Yes ☐ No ☐

1. If yes, how often:

Daily ☐ Weekly ☐ Bi-weekly ☐ Monthly ☐ As Needed ☐

J. Does your company have a drug and alcohol testing policy?

Yes ☐ No ☐

K. Does your company require that subcontractors participate in a drug surveillance/testing program?

Yes ☐ No ☐

L. Does your company have a method of disseminating safety information?

Yes ☐ No ☐

**Required Submittal**

**GEORGIA UTILITY CONTRACTOR'S  
LICENSE CERTIFICATION**

**FC-10337, Terrell Creek Trunk System Sewer Improvements**

Contractor's Name: \_\_\_\_\_

Utility Contractor's License Number: \_\_\_\_\_

Expiration Date of License: \_\_\_\_\_

FC Number and Project Name: **FC-10337, Terrell Creek Trunk System Sewer Improvements**

***Copy of License must be included in Bid***

## PART II

# Draft City-Contractor Agreement

## CONSTRUCTION AGREEMENT

### FC-10337; Terrell Creek Trunk System Sewer Improvements

This Construction Agreement (“Agreement”) is entered into and effective as of \_\_\_\_\_ (the “Effective Date”) between the City of Atlanta (“City”) and the service provider (“Contractor”) set forth below.

<b>Contract Name: Terrell Creek Trunk System Sewer Improvements</b>	<b>Contract No. FC-10337</b>
<b>Contractor</b>	<b>City of Atlanta</b>
<b>Name:</b>	<b>Using Agency: Depart of Watershed Management</b>
<b>Address:</b>	<b>Address: 55 Trinity Ave Atlanta, Georgia 30303</b>
<b>Phone:</b>	<b>Phone: 404-546-3333</b>
<b>Authorized Representative:</b>	<b>Authorized Representative: Mikita Browning (<a href="mailto:mbrowning@AtlantaGa.Gov">mbrowning@AtlantaGa.Gov</a>)</b>

THIS AGREEMENT made and entered into this the \_\_\_\_ day of \_\_\_\_\_ 201\_\_, by and between the City of Atlanta, a municipal corporation of the State of Georgia, (hereinafter the “**City**”) and **Contractor** (hereinafter the “**Contractor**”).

#### WITNESSETH:

**WHEREAS**, the City desires to engage Contractor to perform all Work required by the Contract Documents for **FC-10337; Terrell Creek Trunk System Sewer Improvements** (the “**Project**”); and

**WHEREAS**, Contractor has the necessary personnel and facilities to perform the Work; and

**WHEREAS**, the City of Atlanta, on behalf of the Department of Watershed Management, has recommended Agreement award to Contractor; and

NOW, THEREFORE, for and in consideration of the mutual agreements between the parties hereinafter, and for other good and valuable consideration, the parties hereto do agree as follows:

#### 1.

The City hereby engages Contractor to perform, and Contractor agrees to perform for the City, all Work required by the Agreement Documents relative to the Project.

2.

- a) Contractor represents that it has, or will secure at its own expenses, all personnel required to perform all Work to be completed under this Agreement;
- b) All the Work required hereunder will be performed by Contractor or under the direct supervision of Contractor. All personnel engaged in the Work by Contractor shall be fully qualified and shall be authorized or permitted under applicable State and local law to perform such Work;
- c) None of the Work or services covered by this Agreement shall be transferred, assigned, or subcontracted by Contractor without the prior written consent of the City.

3.

The Agreement Documents relative to this Agreement consist of:

Agreement (Part 1);

Addenda (Part 2);

Required License (Part 3);

Illegal Immigration Reform and Enforcement Act Forms (Part 4);

Supplemental Federal Terms and Conditions (Part 5); **(NOT APPLICABLE)**

Authorizing Legislation (Part 6);

General Conditions (Exhibit A);

Technical Specifications and Drawings (Exhibit B);

Cost Proposal/Bid Tab Sheet (Exhibit C);

(Exhibit D);

(Exhibit E);

Security Policies (Exhibit F);

Contractor Disclosure Forms (Exhibit G);

Additional Required Submittals (Exhibit H);

Contract Compliance Requirements (Appendix A);

## Insurance & Bonding Requirements (Appendix B);

These collectively form the Agreement, and are all as fully a part of the Agreement as if attached to this Agreement or repeated herein.

4.

All reports, information, data, or other documents, given to, prepared by or assembled by Contractor under this Agreement shall be kept confidential and shall not be made available to any individual or organization by Contractor without the prior written approval of the City unless such disclosure is required in order to comply with valid subpoena, court order, or applicable law.

5.

The City may, from time to time request changes in the Work to be performed by Contractor hereunder. No such change, including any increase or decrease in the amount of the compensation, which may be mutually agreed upon by and between the City and Contractor shall be effective and enforceable until and unless a written amendment or change order to this Agreement has been executed by both parties and attached hereto. Contractor acknowledges that this Agreement and any changes to it by amendment, modification, change order or other similar document may have required or may require the legislative authorization of the City's Council and approval of the Mayor. Under Georgia law, Contractor is deemed to possess knowledge concerning the City's ability to assume contractual obligations and the consequences of Contractor's provision of goods or services to the City under an unauthorized contract, amendment, modification, change order or other similar document, including the possibility that the Contractor may be precluded from recovering payment for such unauthorized goods or services. Accordingly, Contractor agrees that if it provides goods or services to the City under a contract that has not received proper legislative authorization or if the Contractor provides goods or services to the City in excess of the any contractually authorized goods or services, as required by the City's Charter and Code, the City may withhold payment for any unauthorized goods or services provided by Contractor. Contractor assumes all risk of non-payment for the provision of any unauthorized goods or services to the City, and it waives all claims to payment or to other remedies for the provision of any unauthorized goods or services to the City, however characterized, including, without limitation, all remedies at law or equity.

6.

Contractor warrants that it has not employed or retained any company or person, other than a bona fide employee working for Contractor to solicit or secure this Agreement; and that it has not paid or agreed to pay any person, company, association, corporation, individual or firm, other than a bona fide employee working for Contractor any fee, commission, percentage, gift, or any other consideration contingent upon or resulting from the award or making of this Agreement. For the breach or violation of the above warranty and upon a finding after notice and hearing, the City shall have the right to terminate this Agreement without liability and, at its discretion, to deduct from the

Agreement price or otherwise recover, the full amount of such fee, commission, percentage, gift or consideration.

7.

During the performance of this Agreement, Contractor agrees to comply with all provisions of Part 2, Chapter 2, Article X, Division 11, including Section 2-1414 of the Code of Ordinances (“**Ordinance**”), City of Atlanta, and to warrant the following:

- a) The Contractor shall not discriminate against any employee, or applicant for employment because of race, color, creed, religion, sex domestic relationship status, parental status, familial status, sexual orientation, national origin, gender identity, age, disability, or political affiliation. As used here, the words “shall not discriminate” shall mean and include, without limitation, the following:

Recruited whether by advertising or other means; compensated, whether in the form of rates of pay, or other forms of compensation; selected for training, including apprenticeship; promoted; upgraded; demoted; downgraded; transferred; laid off; and terminated.

The Contractor agrees to and shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the City setting forth the provisions of the non-discrimination clause.

- b) The Contractor shall, in all solicitation or advertisement for employees, placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for the employment without regard to race, color, creed, religion, sex, domestic relationship status, parental status, familial status, sexual orientation, national origin, gender identity, age, disability, or political affiliation.
- c) The Contractor shall send to each labor union or representative of workers with which the Contractor have a collective bargaining agreement or other contract or understanding a notice advising the labor union or worker’s representative of the Contractor commitments under the Equal Employment Opportunity Program of the City and under the Code of Ordinances and shall post copies of the notice in conspicuous places available to employees and applicants for employment. The Contractor shall register all workers in the skilled trades, who are below the journeyman level, with the U.S. Bureau of Apprenticeship and Training.
- d) The Contractor shall furnish all information and reports required by the Contract Compliance Officer pursuant to the Code of Ordinances, and shall permit access to the books, records and accounts of the Contractor during the normal business hours by the contracting agency and the Contract Compliance Officer for the purpose of investigation so as to ascertain compliance with the program.



- e) The Contractor shall take such reasonable action with respect to any Subcontractor as the City may direct, as a means of enforcing the provisions of paragraphs (a) through (h) herein, including penalties and sanctions for non-compliance; provided, however, that in the event the Contractor becomes involved in or is threatened with litigation as maybe necessary to protect the interest of the City and to effectuate the Equal Employment Opportunity Program of the City; and, in the case of contracts receiving Federal assistance, the Contractor or the City may request the United States to enter into such litigation to protect the interest of the United States.
- f) The Contractor and its Subcontractors, if any, shall file compliance reports at reasonable times and intervals with the City in the form and to the extent prescribed by the Contract Compliance Officer of the City. Compliance reports filed at such time directed shall contain information as to employment practices, policies, programs and statistics of the Contractor and its Subcontractors.
- g) The Contractor shall include the provisions of paragraphs (a) through (h) of this Equal Employment Opportunity Clause in every subcontract or purchase order which materially affects the Project so that such provisions will be binding upon each such Subcontractor or vendor.
- h) A finding, as hereinafter provided, that a refusal by the Contractor or subcontractor to comply with any portion of this program, as herein provided and described, may subject the offending party to any or all of the following penalties.
  - (1) Withholding from the Contractor in violation all future payments under the involved public contract until it is determined that the Contractor or Subcontractor is in compliance with the provisions of the Agreement.
  - (2) Refusal of all future bids for any public contract with the City or any of its departments or divisions until such time as the Contractor or Subcontractor demonstrates that there has been established and there shall be carried out all of the provisions of the program as provided in this article.
  - (3) Cancellation of the public Agreement.
  - (4) In a case in which there is substantial or material violation, or the threat of substantial or material violation, of the compliance procedure therein set forth or as may be provided for by this Agreement, and appropriate proceeding may be brought to enforce these provisions, including the enjoining of Contractor, Subcontractor, or other organizations, individuals or groups who prevent or seek to prevent directly or indirectly compliance with the policy as herein provided.
  - (5)

During the performance of this Agreement, Contractor agrees to comply with Part 2, Chapter 2, Article X, Division 12, including Sections 2-1441 through 2-1460 of the Code of Ordinances of the City of Atlanta, the Equal Business Opportunity (“**EBO**”) Program and to warrant the following:

The Contractor agrees to make good faith efforts to meet the goals for this Agreement by making available opportunities for Minority Business Enterprises (“**MBE**”), African American Business Enterprises (“**AABE**”), Hispanic Business Enterprises (“**HBE**”), Asian Business Enterprises (“**ABE**”) and Native American Business Enterprises (“**NABE**”) and Female Business Enterprises (“**FBE**”) for utilization in the work set forth within this Agreement and shall take the following action as part of their good faith efforts:

- a) Notification to MBE and FBE that the Contractor has subcontracting opportunities available and maintenance of records of the MBE and FBE responses.
- b) Maintenance by the Contractor of a file of the names and addresses of each MBE and FBE contracted and action taken with respect to each such contract.
- c) Dissemination of the Contractor EBO policy externally by informing and discussing it with all management and technical assistance sources; by advertising in news media and by notifying and discussing it with Subcontractor and Supplier.
- d) Specific and continuing written and oral recruitment efforts directed at MBE and FBE Contractor organizations, MBE and FBE assistance organizations.
- e) Sub-divisions for the contract economically feasible segments as practical to allow the greatest opportunity for participation by M/FBEs.
- f) Increasing where possible the number of aggregate purchase items so as to eliminate the requirement of front-end purchases material for as many M/ FBE Subcontractors as possible.
- g) Adoption of the EBO Plan submitted in its response to the Invitation for Bids or Requests for Proposals obligations under this Agreement, as approved by the Office of Contract Compliance.
- h) Submission of monthly reports on the forms and to the extent required by the Director of the Office of Contract Compliance, to be due on the 5th day of each month following the award of the Work set forth in this agreement.
- i) The Contractor further agree that breach of the EBO provisions contained herein shall subject them to any or all of the following penalties:

- 1) Withholding of ten percent (10%) of all future payments under the involved eligible project until it is determined that the Contractor is in compliance.
- 2) Withholding of all future payments under the involved project until it is determined that the Contractor is in compliance.
- 3) Refusal of all future bids or offers for any eligible project with the City of Atlanta or any of its department or divisions until such time as the Contractor demonstrates that there has been established and there shall be carried out all of the EBO provisions contained herein.
- 4) Cancellation of the eligible project.

9.

The City agrees to pay Contractor for the Work performed pursuant to this Agreement as stated in the hereinafter attached as Exhibit C, an amount not to exceed x amount of dollars and cents.

10.

Contractor shall commence the Work within ten (10) calendar days after receipt of Notice to Proceed and shall substantially complete the Work within five hundred ten (510) calendar days from issuance of the Notice to Proceed and fully complete the Work within five hundred forty (540) calendar days of issuance of the Notice to Proceed, except as may be amended by the City in accordance with GC-26 which comprises the Agreement Time or any milestone, as defined herein.

11.

Contractor by the execution of this Agreement, acknowledges that it is possessed of that degree of care, learning, skill, and ability which is ordinarily possessed by other members of its profession and further contracts that in the performance of the duties herein set forth it will exercise such degree of care, learning, skill and ability as is ordinarily employed by Contractor under similar conditions and like circumstances and shall perform such duties without neglect.

12.

Contractor agrees to obtain and maintain during the entire term of this Agreement all of the insurance called for in the Agreement Documents, with the City as an additional insured in each policy of public liability and property damage insurance, and shall furnish to the City a certificate of insurance showing required coverage. The cancellation of any policy of insurance required by this Agreement shall meet the requirements of notice under the laws of the state of Georgia as presently set forth in the Georgia code.

13.

In addition to its agreement to obtain and maintain the insurance as set forth herein above, the Contractor agrees that to the fullest extent permitted by law, the Contractor shall at his sole cost and expense shall indemnify, hold harmless and defend the City, its officers, directors, and employees from and against claims, losses, damages, liabilities, including attorneys' fees and expenses, for bodily injury, sickness or death, and property damage or destruction (other than to the Work itself) to the extent resulting from the recklessness, intentionally wrongful conduct, or negligent acts or omissions of Contractor, Subcontractors, anyone employed directly or indirectly by any of them or anyone for whose acts any of them may be liable.

Such obligation shall not be construed to negate, abridge or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in Appendix B, Insurance and Bonding Requirements, Paragraph F.

In any and all claims against the City, the Engineer or any of their agents or employees by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation in Appendix B, Insurance and Bonding Requirements, Paragraph F, shall not be limited in any way, including but not limited by the limits of the liability insurance required under this Agreement and the Agreement Documents, nor limited by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

14.

Except as expressly stated to the contrary in the Agreement Documents, the Contractor shall obtain, at its own expense, all permits and licenses required by all municipal, state and federal authorities now in force, or which may hereafter be in force, pertaining to the performance of the Work called for by this Agreement. The Agreement Documents, including this Agreement, constitute the entire and integrated Agreement between the City and the Contractor and may be amended only by written instrument which is approved by both parties. The parties agree that this Agreement shall not become binding on the City, and the City shall incur no liability upon the same, until this Agreement has been executed by the Mayor, attested to by the Municipal Clerk and delivered to Contractor.

15.

The Georgia Security and Immigration Compliance Act of 2006 pursuant to O.C.G.A. § 13-10-91 and Georgia Department of Labor Rule 300-10-1-02 is effective as of July 1, 2007, and applies to contracts for services which are physically performed with a public entity. The Contractor is required to submit the attached Georgia Security and Immigration Compliance Act of 2006 Required Contractor Submittal, the Contractor Affidavit and the Subcontractor Affidavits as shown in Exhibit "C". Contractor's failure to comply with this requirement shall constitute a material default in the contract, which may result in termination of this Original Agreement.

### Ethics in Contracts.

Gratuities and Kickbacks. In accordance with the City of Atlanta's Code of Ordinances, Section 2-1484, as may be amended, it shall be unethical for any person to offer, give or agree to give any employee or former employee or for any employee or former employee to solicit, demand, accept or agree to accept from another person a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, preparation or any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy or other particular matter pertaining to any program requirement or a contract or subcontract or to any solicitation or proposal therefore. Additionally, it shall be unethical for any payment, gratuity or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor or any person associated therewith as an inducement for the award of a subcontract or order.

Fraud and misrepresentation. Any written or oral information provided by Contractor, directly or indirectly related to the performance of the services required by this Agreement, constitutes material representations upon which the City relies for the requirements of the Agreement and compliance with local, state and federal laws, rules and regulations. Contractor agrees to notify the City immediately of any information provided to the City that it knows and/or believes to be false and/or erroneous and immediately provide correct information to the City and take corrective action. Contractor further agrees to notify the City immediately of any actions or information that it believes would constitute fraud or misrepresentation to the City in performance of this Agreement, whether or not such information actually constitutes fraud and/or misrepresentations, by contacting the Integrity Line 1-800-884-0911. Contractor agrees to place signage provided by the City regarding the Integrity Line at the location to which Contractor's employees report to perform the services required by this Agreement. Contractor acknowledges and agrees that a finding of fraud or other impropriety on the part of the Contractor or any of its[subcontractors may result in suspension or debarment of the Contractor; and the City may pursue any other actions or remedies that the City may deem appropriate. Contractor agrees to include this clause in its subcontracts and take appropriate measures to ensure compliance with this provision. The City shall be entitled to adjust or exclude payments or portions of payments to Contractor found by the City to have been increased because the Contractor furnished cost or pricing data was misrepresented, inaccurate, incomplete or not current as of the date it was submitted.

The Contractor warrants that it has not employed or retained any company or person, other than a bona fide employee working for the Contractor, to solicit or secure this Agreement; and that the Contractor has not paid or agreed to pay any person, company, association, corporation, individual or firm, other than a bona fide employee working for the Contractor, any fee, commission, percentage, gift or any other consideration contingent upon or resulting from the award or making of this Agreement. For the breach or violation of the above warranty, and upon

a finding after notice and hearing, the City shall have the right to terminate the Agreement without liability, and, at its discretion, to deduct from the Agreement, or otherwise recover the full amount of such fee, commission, percentage, gift or consideration."

*[Signatures on the following pages.]*

Draft

**CITY OF ATLANTA:**

**[CONTRACTOR]:**

By: \_\_\_\_\_

Mayor

By: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

**ATTEST:**

**ATTEST:**

\_\_\_\_\_

Municipal Clerk (SEAL)

\_\_\_\_\_

Corporate Secretary/Asst. Secretary  
(affix seal)

**RECOMMENDED:**

\_\_\_\_\_

Department of Watershed Management

**APPROVED:**

\_\_\_\_\_

Chief Procurement Officer

**APPROVED AS TO FORM:**

\_\_\_\_\_

City Attorney

# Exhibit A

## General Conditions



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## **PROJECT NO. FC-10337**

### **PROJECT TITLE: Terrell Creek Trunk System Sewer Improvements**

## **GENERAL CONDITIONS**

### **GC-1 AGREEMENT AND AGREEMENT DOCUMENTS**

The General Conditions, Special Conditions, Technical Provisions, Drawings, Changes, and all other parts of the Agreement Documents are complementary, and a requirement occurring in one shall be as binding as though occurring in all. The parts of the Agreement are complementary and describe and provide for completion of the Work. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Agreement Documents and in no way affect, and shall not be considered in the interpretation of the provisions to which they refer.

Execution of the Agreement by Contractor is a representation that Contractor has visited the Site, become familiar with the local conditions under which the Work is to be performed, and has correlated personal observations with the requirements of the Agreement Documents.

The intent of the Agreement Documents is to include all items necessary for the proper execution and completion of the Work. Work not specifically covered in the Agreement Documents shall be required if it is consistent therewith and reasonably inferable therefrom as being necessary to produce the intended results. Words and abbreviations that have well-known technical or trade meanings are used in the Agreement Documents in accordance with such recognized meanings.

If and to the extent of any inconsistency, ambiguity, conflict, discrepancy or error in the Agreement Documents (a "discrepancy"), Contractor shall immediately notify the Owner in writing and seek clarification from the Owner (within 24 hours of discovery). In the event that the Owner fails to clarify such discrepancy within a reasonable time under the circumstances, Contractor shall proceed with the Work and give precedence to the Agreement Documents in the following order of priority:

- (1) Written modifications (including without limitation Change Orders and Change Directives) issued after execution of the Agreement;
- (2) Addenda issued in writing prior to the execution of the Agreement;
- (3) the Agreement;
- (4) Addendum, if any, to the General Conditions and Special Conditions;
- (5) Special Conditions;

- (6) the General Conditions;
- (7) the Specifications; and
- (8) the Plans and Drawings.

If the application of the foregoing procedure fails to resolve the discrepancy, then unless Contractor sought and obtained the clarification of the discrepancy prior to entering into this Agreement, then the discrepancy shall be resolved by construing the provision in favor of the Owner and in such a manner as will further the Owner's best interests and which may impose the more expensive or greater obligation upon Contractor. When Contractor fails to provide this notice and seek clarification, Contractor assumes full responsibility to correct or adjust work performed pursuant to Agreement Documents known, or which should have been known, to contain such a discrepancy.

## **GC-2 ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS**

During the progress of the Work, the Engineer may issue additional instructions and Drawings supplemental to those listed in the Special Conditions showing additional details required for the performance of the Work, and may issue revised Drawings pursuant to Change Orders or Change Directives, or for correction of errors in the Plans. The additional instructions and Drawings thus supplied will become a part of the Agreement Documents. Contractor shall carry out the Work in accordance with the additional instructions and Drawings.

## **GC-3 DEFINITIONS**

The following terms as used in this Agreement are respectively defined, as follows:

Abandonment - Shall mean the permanent termination of the use of, or of service from in or on, a facility.

Approved, Directed, Ordered, Or Their Derivatives - Approved, as directed, or ordered by the Engineer or the City, unless otherwise clearly indicated.

Acceptance - The formal written acceptance by the City of the fully and finally completed Work.

Addenda - Revisions to the Proposal Documents issued by the City prior to opening of the Bid.

Agreement - The written agreement for the performance of and payment for the Work, which includes by reference and is a part of the Agreement Documents, executed on behalf of the City and the Contactor, also called City-Contractor Agreement.

Agreement Documents - The Agreement Documents are defined in other portions of the Agreement, but include, at least, the following, if applicable to this Project:

This City-Contractor Agreement;  
General Conditions (Part I);  
Special Conditions (Part II);  
Scope of Service (Part III);  
Equal Business Opportunity Program (Appendix A);  
Insurance and Bonding Requirements (Appendix B);  
LOCAL Bidder Preference Program (Appendix C);  
Georgia Security and Immigration Compliance Act of 2006 (Appendix D);  
Supplemental General Conditions for Federally Assisted SRF (Appendix E);  
Bid Form (Exhibit A);  
Required Submittals (Exhibit B);  
Addendum (Exhibit C);  
Legislation (Exhibit D); and  
Performance and Payment Bonds

The Agreement Documents may also be referred to from time to time as the “Contract Documents.”

Agreement Price - The price or prices for the Work or items of Work set forth in the Bid.

Agreement Time - The number of calendar days stated in the Agreement Documents for the Substantial Completion of the Work or Final Completion of the Work, or the achievement of a specific interim milestone, as the context may require.

Applicant - Shall mean any person, company or corporation who intends or plans to request for water services for a new development.

Application for Payment - The form approved by the City that is to be used by Contractor in requesting progress payments or final payment, together with such supporting documentation as is required in the Agreement Documents. The Application for Payment may also be called Payment Application or Progress Payment.

Bid - The offer or bid of the Bidder submitted in the prescribed manner on the prescribed form setting forth the prices for the Work to be performed together with supplemental information as required by the Agreement Documents.

Bidder - Any person, firm, partnership, corporation or any combination thereof submitting a Bid for the Work.

Bonds - Bid, Performance Bonds, Payment Bonds, and other instruments of security furnished by Contractor and its surety in accordance with the Agreement Documents.

Bond means a written instrument of surety approved by the City with a valid Certificate of Authority issued by the United States Department of Treasury under Sections 9304 to 9308 of Title

One of the United States Code as security to the City, on behalf of a Bidder or the Contractor, to guaranty faithful performance of acts, duties or obligations under the Contract Documents and includes the following.

- Bid Bond means the security instrument furnished with a Bid to guaranty that, if the Bidder is awarded the Contract, the Bidder will execute the Agreement within the time specified in the Bidding Documents.
- Maintenance Bond, if required on the Project, means the security instrument furnished by the Contractor and its surety on the approved form as a guaranty, in addition to other warranties and guaranties, to remedy any defects in the Work of the Contractor which may develop during the warranty period after Completion of the Contract.
- Payment Bond means the security instrument furnished by the Contractor and its surety on the Payment Bond Form as a guaranty that Contractor will pay in full all bills and accounts for materials and labor used in the Work.
- Performance Bond means the security instrument furnished by the Contractor and its surety on the Performance Bond Form as a guaranty that the Contractor will complete the Work in accordance with the terms of the Contract.

Change - Any change in the Work authorized by the Engineer, including Field Changes, Work Authorizations or Change Orders.

Change Directive – A written order prepared by the Owner and signed by the Owner directing a Change in the Work prior to or absent an agreement or adjustment, if any, in the Agreement Price or Agreement Time, or both.

Change Order - A written agreement signed by the Owner and Contractor, stating their agreement upon all of the following: (1) change in the Work that includes the addition or reduction of Work; (2) the amount of the adjustment, if any, in the Agreement Price; and (3) the extent of the adjustment, if any, in the Agreement Time and includes at least one of the above Changes. A Change Order does not include a Field Change, Work Authorization or Change Directive.

City - Shall mean the City of Atlanta, Georgia, and shall include all agencies, establishments or officials of the government of the City. The City may also be referred to from time to time as the “Owner.”

City-Contractor Agreement - The written agreement for the performance of and payment for the Work executed on behalf of the City and the Contractor, which is both a part of the Agreement Documents and includes all Agreement Documents by reference. The City-Contractor Agreement may also be called “Agreement.”



City's Contractor - Shall mean the legally authorized representative of the City, a private contractor, or other concerned agency performing Work under a direct Agreement with the City.

Construction - Shall mean the actual site preparation, building and all related Work, including facility relocation and adjustments.

Construction Easement/Temporary Easement - Any space or area dedicated to the City or other entity for the purpose of utilities or location of utilities for a specific period of time.

Construction Equipment - Equipment used in the performance of the Work but not incorporated therein.

Contract Documents - The Agreement Documents referenced above.

Contractor - Any firm, partnership, corporation, joint venture, LLC or any combination thereof who enters into a contractual Agreement with the City. This excludes Subcontractors/Sub-consultants.

CPM Schedule - A logic tied computerized network schedule incorporating all elements of the Work, prepared and updated in accordance with the requirements of the Special Conditions, subject to approval of the City.

Day - A calendar day of twenty-four (24) hours lasting from midnight one day to midnight the next day.

Department - Shall mean the Department of Watershed Management.

Designer - Shall refer to the firm licensed to practice engineering in the State of Georgia that seals the plans and specifications prior to bid.

Drawings - That part of the Agreement Documents which show the shape, outlines, dimensions, characteristics, scope of and other similar requirements governing the Work, or portions thereof, prepared by the Designer and including revisions thereto. The term is used interchangeably with the word "Plans" and includes without limitation Standard Details and Drawings.

Engineer - City of Atlanta or duly authorized representative assigned to administer the technical aspects of the Agreement. The terms Resident Engineer, Contract Administrator, or Contract Manager may be used interchangeably to denote the person designated expressly by the City with authority to administer the Agreement.

Equipment - Equipment incorporated or to be incorporated in the Work.

Field Change - A Change in Work that includes changes or adjustments to quantities or budget items but does not include a Change in the overall Agreement Price, overall Agreement Time or use of allowance items, which is required as a result of field conditions that require such

adjustments. A Field Change does not include a Work Authorization, a Change Order or a Change Directive and is agreed upon and executed by an authorized City representative and the Contractor.

Force Account - A method of payment, other than lump sum or unit price, for Work ordered by Change Order and paid for in accordance with force account procedures indicated in “Force Account” Section of the General Conditions.

General Conditions - The General Conditions of the Agreement for construction that govern the rights, duties, and obligations of the parties.

GDOT - The Georgia Department of Transportation.

Inspector - The authorized representative of the Engineer or the City assigned to make detailed inspection of any or all portions of the Work or Materials thereof.

MARTA - Shall mean the Metropolitan Atlanta Rapid Transit Authority, or its designated legal representatives.

Materials - Materials incorporated or to be incorporated in the Work unless otherwise clearly indicated.

Modifications – Binding changes, addenda, revisions, or the like, to the Work or the Agreement Documents, including Changes to Work made by Change Order, Work Authorization, Field Change or Change Directive as required by GC-41.

Notice of Intent or Letter of Intent to Award - The written notice of the acceptance of the Bid from the City to a Bidder.

Notice to Proceed - (“NTP”) Written communication issued by the City to Contractor authorizing it to proceed with the Work and establishing the date of commencement of the Agreement time and on which Contractor shall start to perform its obligations in accordance with the Agreement Documents.

Owner - Same as “City” above.

Permanent Easement - Any space or area dedicated to the City or other entity for the purpose of constructing and/or maintain existing or future utilities.

Plans - That portion of the Agreement Documents describing in drawings, the shapes, outlines, dimensions, characteristics, scope and other similar requirements governing the Work, or portions thereof, prepared by the Designer and including revisions thereto. The term is used interchangeably with the word "Drawings" and includes without limitation Standard Details and Drawings.

Project - The Project is identified in the City-Contractor Agreement and is the total construction of which the Work performed under the Agreement Documents is a part.

Public Space/Public Right-of-Way - Shall mean the area between private property lines under the jurisdiction of the City, county, state or federal government, including, but not limited to, an alley, roadway, median, sidewalk, public way, or any combination thereof.

Punch List - Shall mean the lists prepared by the City's Representative or Design Consultant prior to Substantial Completion and through Final Completion indicating items of Work not in accordance with the requirements of the Contract Documents and which must be performed, corrected and accomplished prior to acceptance of the Work.

Replacement Facility - Shall mean that facility, meeting the Department's current standards, which will be constructed or provided, as a consequence of the rearrangement of an existing facility or portion thereof.

Resident Engineer - The City's Engineer who is assigned to the Site or any part thereof.

Responsive Bid - A Bid which is accurate and complete with respect to Bid schedules and information submitted relative to the technical qualifications and financial responsibility and is able to comply with Equal Opportunity and other requirements of the Agreement Documents.

Samples - Shall mean physical examples furnished by Contractor, which illustrate materials, equipment or workmanship. Approved Samples in conformance with the Contract Documents establish the standards of the Work.

Shop Drawings - Shall mean drawings, diagrams, illustrations, schedules or other data illustrating the Work, and all illustrations, brochures, standard schedules, performance charts, specifications, instructions, diagrams, and other information prepared by a Subcontractor, Supplier, vendor or manufacturer and submitted by Contractor as required in the Contract Documents.

Scope of Services - See "Work."

Sidewalk Area - Shall mean that portion of a street between the curb lines and the adjacent property lines intended primarily for the use of pedestrians whether paved or in use.

Site - The areas required for the performance of the Work.

Special Conditions - Terms which supplement items covered in General Conditions.

Specifications, Technical Specifications - Shall mean those portions of the Contract Documents consisting of written technical descriptions, provisions or requirements of the Work to be performed under the Contract Documents, including, but not limited to, the quantities or quality of materials, equipment, construction systems or applications. Standards for specifying materials or testing that are cited in the Specifications are part of the Contract Documents.

Standards - Shall mean those current Standards of Engineering analysis and design, including Installation and Material Specifications, which the City utilizes in the design and construction of its own projects.

State - The State of Georgia.

Subcontractor - An individual, firm, corporation or any combination thereof having a direct contract with Contractor for the performance of a part of the Work at the site.

Substantial Completion - The date certified by the Engineer when all or a part of the Work, identified in the Engineer's certification, is sufficiently completed in accordance with the requirements of the Agreement Documents so that the identified portion of the Work can be utilized for the purposes for which it is intended.

Supplier - Any individual, firm, or corporation who supplies Material or Equipment for the Work (including that fabricated to a special design) but who does not perform or provide significant labor at the Site.

Temporary Facility - Shall mean a facility constructed for whatever purpose and not intended to be permanent.

Utility - Shall mean and include all public, private, or cooperatively owned lines, facilities and systems for producing, transmitting or distributing communications, power, electricity, heat, gas, oil, crude products, water, steam, waste, storm water, and other similar commodities, such as public owned fire and police signal systems, which directly or indirectly serve the public or any part thereof.

Work - All the services specified, indicated, shown, or contemplated by the Agreement Documents and the furnishing by Contractor of all Materials, Equipment, labor, methods, processes, construction and manufacturing materials and equipment, tools, plants, supplies, power, water, transportation and other things necessary to complete such services in accordance with the Agreement Documents and that will ensure a functional and complete facility.

Work Authorization – A Change in Work that adds, changes or removes scope of work from the Agreement but does not include a change in Agreement Time or Agreement Price; or the utilization of an allowance or contingency item, as permitted and defined by the Agreement documents. A Work Authorization does not include a Change Order, a Field Change or a Change Directive and is agreed upon and executed by an authorized City representative and the Contractor.

Working Days - Generally, Monday, Tuesday, Wednesday, Thursday, and Friday; however, on some projects, Saturday and/or Sunday may be considered working days, if specified as working days by the City or Engineer. Holidays are not considered Working Days.

Written Notice - A written statement transmitted from one party to an authorized representative of another party

## **GC-4 APPLICABLE CODES, SPECIFICATIONS, AND STANDARDS**

### **GC-4.1 General**

All codes, Specifications, regulations, laws, ordinances, and standards referred to in the Agreement Documents shall mean, and are intended to be, the latest editions, amendment, and revisions of such reference standard in effect as of the date of the Invitation to bid for this Agreement, and as may be updated or amended to be applicable to the Project.

### **GC-4.2 Standards**

Reference to a technical society, institution, association, or governmental authority, or pronoun in place of them, is made in the Agreement Documents in accordance with the following abbreviations:

ANSI	American National Standards Institute;
ASTM	American Society for Testing and Materials;
AWS	American Welding Society;
AASHTO	American Association of State Highway and Transportation Officials;
ACI	American Concrete Institute;
AFBMA	Anti-Friction Bearing Manufacturer's Association;
AI	Asphalt Institute;
AISI	American Iron and Steel Institute;
AISC	American Institute of Steel Construction;
AMCA	Air Moving and Conditioning Association;
API	American Petroleum Institute;
ASME	American Society of Mechanical Engineers;
ASTM	American Society for Testing and Materials;
AWG	American (Brown and Sharpe) Wire Gauge;
AWS	American Welding Society;
AWWA	American Water Works Association;
CRSI	Concrete Reinforcing Steel Institute;
EPA	Environmental Protection Agency (Federal);
EPD	Environmental Protection Division (Georgia State);
GDOT	Georgia Department of Transportation (“GDOT”);
MARTA	Metropolitan Atlanta Rapid Transit Authority;
NACE	National Association of Corrosion Engineers;
NFPA	National Fire Protection Association;
NSF	National Sanitary Foundation;
OSHA	Occupational Safety and Health Administration; and
UL	Underwriter’s Laboratories Incorporated.

## **GC-5 ADEQUACY OF DESIGN**

Before placing its Bid to the City, and continuously after the execution of the Agreement, Contractor shall carefully study and compare the Agreement Documents and shall at once report any error, ambiguity, inconsistency or omission that may be discovered, including any requirement which may be contrary to any law, ordinance, rule, regulation, or order of any public authority bearing on the performance of the Work. By submitting its Bid for the Agreement and the Work under it, Contractor agrees that the Agreement Documents, along with any supplementary written instructions issued by or through the Engineer that have become a part of the Agreement Documents, appear accurate, consistent, and complete. Contractor shall perform no portion of the Work at any time without Agreement Documents or, where required, approved shop Drawings, product data, or samples for such portion of the Work.

No claims shall be made by Contractor based on claims of defects, errors, omissions, ambiguities or inconsistencies in the Agreement Documents which were reasonably discoverable by a review of the Agreement Documents and correlation thereof with the actual conditions at the Project Site. No observation of the Engineer or City, and no inspections, tests or approval shall relieve Contractor from its obligation to perform the Work in strict conformity with the Agreement Documents.

Contractor has determined, by its own investigation and research, all the conditions affecting the work to be done and materials to be furnished and does not rely upon any representation by the City in connection therewith.

THE CITY, ITS AGENTS AND EMPLOYEES MAKE NO REPRESENTATION OR WARRANTY OF ANY NATURE WHATSOEVER TO CONTRACTOR CONCERNING THE AGREEMENT DOCUMENTS. By the execution hereof, Contractor acknowledges and represents that it has received, reviewed and carefully examined such documents, has found them to be complete, accurate, adequate, consistent, coordinated and sufficient for construction, and that Contractor has not, does not, and will not rely upon any representations or warranties by the City concerning such documents as no such representations or warranties have been or are hereby made.

Prior to execution of the Contract, Contractor has evaluated and satisfied itself as to the condition and limitations under which the Work is to be performed, including, without limitation, (i) the location, condition, layout, and nature of the Project Site and surrounding areas, (ii) generally prevailing climatic conditions, (iii) anticipated labor supply and costs, (iv) availability and cost of materials, tools and equipment, and (v) other similar issues. With the exception of any differing site conditions clause, if any, that may be included in the Agreement Documents, the City assumes no responsibility or liability for the physical condition of the Project Site, or any improvements located on the Project Site. Contractor shall be solely responsible for providing a safe place for the performance of the Work.

Contractor acknowledges and agrees that its obligation to construct the Work in accordance with the Agreement Documents is not in any way altered or affected by the observations or inspections of the City or the Designer. Further, Contractor acknowledges and agrees that any warranty periods included herein merely set forth the time period during which Contractor is contractually required to specifically perform corrective work and that these warranty periods are not and shall

not be construed to be exclusive remedies of the City. Instead, Contractor acknowledges and agrees that it shall be liable to the City for the cost of correcting Work not performed in accordance with the Agreement Documents for the full period of the applicable statute of limitations.

#### **GC-6 CITY OF ATLANTA ORDINANCES**

Contractor shall be bound by the provisions of all City of Atlanta Ordinances. It is Contractor's responsibility to be aware of and adhere to all existing or future ordinances that are in effect during the performance of the Agreement.

#### **GC-7 PERMITS AND REGULATIONS**

All applicable federal laws, state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Agreement throughout to the extent that such requirements do not conflict with federal laws or regulations and in the event of a conflict, federal laws shall govern. All Work performed within the right of way of GDOT shall be in accordance with GDOT regulations, policies, and procedures.

Except as expressly stated in the Contract Documents, Contractor shall secure and will provide all building permits, licenses, and other applicable legal documents required for Contractor's performance of the Project.

Contractor shall give all notices and comply with all permits, laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn and specified.

If any permit, license or certificate expires or is revoked, terminated or suspended as a result of any action on the part of Contractor or any person or entity for which Contractor is responsible, it shall neither be entitled to any additional compensation, nor to an extension of Agreement Time.

#### **GC-8 TAXES**

Contractor shall pay all sales, retail, occupational, service, excise, old age benefit and unemployment compensation taxes, consumer, use and other similar taxes as well as any other taxes or duties on the Material, Equipment and labor for the Work or portions thereof provided by Contractor which are legally enacted by any municipal, county, federal or state authority or department or agency thereof at the time Bids are received, whether or not yet effective.

All records maintained by Contractor pertaining to such taxes and levies and payment thereof shall be made available to the City at reasonable times for inspection, audit and copying.

#### **GC-9 ARREARS TO OFFSET DEBT AGAINST CITY**

No money shall be paid by the City upon any claim, debt, demand or account whatsoever, to any person, firm, or corporation who is in arrears to the City for taxes, or any other debt or claim, and the City shall be entitled to counterclaim and/or offset any such debt, claim, demand or account in the amount of taxes so in arrears or other debts or claims of the City, and no assignment or transfer of such debt, claim, demand, or account after the said taxes are due or after any such debt or claim is asserted by the City, shall affect the right of the City to so offset the said taxes, debts, or other obligations against the same.

Contractor agrees that the City shall be allowed to setoff and recoup any claim or demand that it may have against Contractor (or any of its constituent members if Contractor is a joint venture) whether such claim or demand is liquidated or unliquidated. Contractor further agrees that in the event it assigns or sells any amounts due or to become due under this Agreement, notice to the City of such assignment or sale shall not affect the City's rights of setoff or recoupment against Contractor for claims subsequently arising on this or any other project. Any assignee or purchaser of any amounts due Contractor under this Agreement shall be bound to these provisions and shall assume the risk of subsequently arising claims of setoff or recoupment.

#### **GC-10 LIENS**

Contractor acknowledges that neither it nor any of its Subcontractors or Suppliers have lien rights on public property. Contractor will furnish the City with evidence, satisfactory to the City that all persons who have done Work or furnished materials in performance of this Agreement have been fully paid before it shall demand final payment due or unpaid under this Agreement. In case such evidence is not furnished, an amount necessary to meet the lawful claims of the persons aforesaid may be retained from any monies due or that may become due the said Contractor under this Agreement until the lawful claims aforesaid shall be fully discharged, and it is understood and agreed that the City assumes no obligation nor in any way undertakes to pay such lawful claim out of any funds due or that may become due the said Contractor out of the City's own funds.

If, in its sole discretion, the City wishes to make joint payment to Contractor and any of its Subcontractors or Suppliers, Contractor agrees that the City may do so, and Contractor agrees to cooperate with the City in identifying the amounts due Subcontractors and Suppliers to facilitate the making of said joint payment.

#### **GC-11 ASSIGNMENTS**

Contractor shall retain personal control and shall give personal attention to the fulfillment of this Agreement. Contractor shall not assign the whole or any part of this Agreement or any monies due or to become due hereunder without the written consent of the City. In case Contractor assigns all or any part of any monies due or to become due under this Agreement, the instrument of assignment shall contain, or shall be deemed to contain, a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to Contractor shall be subject to claims of all persons, firms, and corporations for services rendered or materials



supplied for the performance of the Work called for in this Agreement and to setoffs and recoupments by the City as set forth in GC-9 above. Any assignment of this Agreement in whole or in part or any assignment of monies due or to become due hereunder must bind the assignee to all terms and conditions of this Agreement and protect and preserve all rights and remedies of the City as against Contractor and extend to the City the same rights and remedies against assignee. In the event that any person or entity should claim entitlement to all or any part of any monies due or to become due under this Agreement under the doctrine of subrogation, it further agrees that its rights shall be subject to claims of all persons, firms, and corporations for services rendered or materials supplied for the performance of the Work called for in this Agreement and to setoffs and recoupments by the City as set forth in GC-9 above.

## **GC-12 PATENTS AND ROYALTIES**

Contractor shall indemnify and hold harmless the City and its officers, agents, servants, and employees from liability or all claims of any nature or kind, including costs, attorneys' fees, and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Agreement, including its use by the City, unless otherwise specifically stipulated in the Agreement Documents.

If Contractor uses any design, device or Materials covered by letters, trademarks, patent or copyright, it shall provide for such use by suitable agreement between the City and the holder of such design, device or Material. It is mutually agreed and understood that, without exception, the Agreement Price shall include all royalties or costs arising from the use of such design, device, or Materials in any way involved in the Work. Contractor or its sureties or both shall indemnify and hold harmless the City, its officers and employees from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or Materials or any trademark or copyright in connection with Work agreed to be performed under this Agreement and Contractor shall indemnify the City for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the Work or after completion of the Work, including any costs or expenses for experts and attorneys' fees.

## **GC-13 OUT-OF-STATE CONTRACTORS**

If the lowest responsive Bidder is a foreign corporation, partnership, or sole proprietorship, the Bidder hereby irrevocably appoints the Secretary of State of Georgia as its agent for services of all legal process for the purpose of this Agreement only and shall obtain all required certificates and licenses required by the Georgia Law.

## **GC-14 CONTRACTOR'S OBLIGATIONS**

### **GC-14.1 Supervision and Construction Procedures**

#### **GC-14.1.1**

Contractor shall supervise and direct the Work, using Contractor's best skill and attention. Contractor shall be solely responsible for all construction means, methods, techniques, sequences and procedures and shall coordinate all portions of the Work under the Agreement. All Work under the Agreement shall be performed in a skillful and workmanlike manner. Contractor shall exercise its control over all means, methods, techniques, and procedures so as to carefully and diligently coordinate the work of all Subcontractors and Suppliers or anyone working by, through, or under Contractor or a Subcontractor or Supplier.

#### GC-14.1.2

Contractor shall be responsible to the City for the acts and omissions of Contractor's employees, Subcontractors, Suppliers, and their agents and employees, and any other persons performing any of the Work under a contract with Contractor or a Subcontractor or Supplier.

#### GC-14.1.3

Contractor shall not be relieved from Contractor's obligations to perform the Work in accordance with the Agreement Documents by the activities or duties of the Engineer in the administration of the Agreement or by inspections, tests, or approvals required or performed by persons other than Contractor.

#### GC-14.1.4

Contractor shall carefully study and compare the Agreement Documents with each other and with the site conditions and other information furnished by the Owner and shall at once report in writing to the Owner alleged errors, inconsistencies or omissions. If Contractor performs any construction activity involving an error, inconsistency or omission in the Agreement Documents that Contractor recognized or reasonably should have recognized and without having given written notice to the Owner, Contractor shall assume complete responsibility for such performance and shall bear the full amount of the attributable costs for correction.

#### GC-14.1.5

Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information available to Contractor with the Agreement Documents before commencing activities. Errors, inconsistencies, or omissions discovered shall be reported in writing to the Owner at once and shall be subject to the provisions of the last sentence of GC-14.1.4 above.

## GC-14.2 Labor and Materials

### GC-14.2.1

Unless otherwise provided in the Agreement Documents, Contractor shall provide and pay for all labor, Materials, Equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work, whether temporary or permanent, and whether or not incorporated or to be incorporated in the Work.

### GC-14.2.2

Contractor shall, at all times, enforce strict discipline and good order among Contractor's employees and Subcontractors, and shall not employ on the Work any Subcontractor, unfit person or anyone not skilled in the task assigned them. The City may, after Written Notice, require Contractor to remove from the Work any employee the City deems incompetent, careless, or otherwise objectionable, including any employee of a Subcontractor or Supplier.

### GC-14.2.3

All Work at the site shall be performed during regular working hours, except upon the City's written consent given after prior Written Notice.

## GC-14.3 Contractor's Construction Schedule

Contractor shall comply with all scheduling requirements set forth in the Agreement Documents, including but not limited to the Special Conditions requirements for a CPM Schedule for performance of the Work.

## GC-14.4 Conditions Affecting the Work

Contractor shall be responsible for having taken all steps necessary to ascertain the nature and location of the Work and the general and local conditions that can affect the Work or the cost thereof. Failure by Contractor to fully acquaint itself with conditions that may affect the Work, including but not limited to conditions relating to transportation, handling, storage of Materials, availability of labor, water, roads, weather, topographic and subsurface conditions, as-built conditions, other separate contracts to be entered into by the City relating to this Project that may affect the Work of Contractor, applicable provisions of law, and the character and availability of equipment and facilities needed prior to and during the prosecution of the Work, shall not relieve Contractor of its responsibilities under the Agreement Documents and shall not constitute a basis for an equitable adjustment or additional compensation under any circumstances. The City assumes no responsibility for any understanding or representations concerning conditions made by any of its officers, agents, or employees prior to the execution of the Agreement, unless such understanding or representations are expressly stated in the Agreement Documents.

**GC-15 RIGHT OF ENTRY**

The City reserves the right to enter the Site of the Work herein contracted for, by such agent or agents as they may elect, for the purpose of inspecting the Work, or for the purpose of installing such collateral Work as the City may desire. Contractor shall cooperate and coordinate with other contractors prosecuting other phases of the construction. Furthermore, if deemed necessary by the Engineer, Contractor will incorporate work activities of other City contractors directly into the schedule such that no phase of the Project(s) is delayed or impacted.

**GC-16 NOTICES**

Any notice, consent, approval, or other communication which is provided for or required by the Agreement Documents must be in writing and may be delivered in person to any party or may be sent by a facsimile transmission or by registered or certified U.S. mail, with postage prepaid, return receipt requested. Copies of all facsimiles shall also be sent via first class mail. Any such notice or other written communication shall be deemed received by the party to whom it is sent (i) in the case of delivery by hand or delivery by reputable national or local courier (such as United Parcel Service or Federal Express), on the date of delivery to the party to whom such notice is addressed, (ii) in the case of facsimile transmission, one working day after the date of successful transmission (provided that an additional first class mail copy of such notice is subsequently received within five (5) days of the facsimile transmission), and (iii) in the case of registered or certified mail, the date receipt is acknowledged on the return receipt for such notice. All such notices and other written communications shall be sent to the persons and addresses listed below

If to Owner:

Contract Administrator  
Department of Watershed Management  
55 Trinity Avenue  
Suite 5400  
City Hall  
Atlanta, Georgia 30303

and

Chief Procurement Officer  
 Department of Procurement  
 Room 1790  
 55 Trinity Avenue  
 Atlanta, Georgia 30303\_\_\_\_\_

If to Contractor:

Representative

Contractor  
 Address  
 City, State, Zip\_\_\_\_\_

The addresses and persons listed may be changed at any time by giving Written Notice in accordance with this Article GC-16.

### **GC-17 SAFETY PRECAUTIONS AND PROGRAMS**

The City, the Engineer, or their agents, employees or representatives are not responsible for the means, methods, techniques, sequences or procedures utilized by Contractor, or for the safety precautions and programs in connection with the Work. Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work and for complying with all applicable rules, ordinances, state and federal laws and regulations.

### **GC-18 SAFETY OF PERSONS AND PROPERTY**

#### **GC-18.1 Damage, Injury, or Loss**

Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury, or loss to:

- (1) All employees on the Work and all other persons who may be affected thereby;
- (2) All the Work and all Materials and Equipment to be incorporated therein, whether in storage on or off the site, under the care, custody, or control of Contractor or any of Contractor's Subcontractors;
- (3) Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction; and
- (4) The Work of the City or other separate contractors.

#### **GC-18.2 Notice**

Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury, or loss.

#### **GC-18.3 Warning, Signage**

Contractor shall erect and maintain, as required by existing conditions and the progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

#### GC-18.4 Hazardous Materials

When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

#### GC-18.5 Remedy

Contractor shall promptly remedy all damage or loss to any property caused in whole or in part by Contractor, any Subcontractor, Supplier or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, except damage or loss attributable solely to the acts or omissions of the City, the Engineer or anyone directly or indirectly employed by any of them in any way, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of Contractor. The foregoing obligations of Contractor are in addition to Contractor's obligations under the Insurance Section of the General Conditions or other provisions of the General Conditions.

#### GC-18.6 Project Safety Coordinator

Contractor shall provide a project safety coordinator who shall be devoted full time toward accident prevention during construction. The qualifications of the project safety coordinator shall be submitted to the Department of Watershed Management Office of Security and Safety (OSS) for approval. If the candidate meets the qualifications, the candidate will be interviewed by OSS to confirm the candidate's experience. Individuals must meet the requirements outlined below to be qualified for the position.

- (1) (a) Four (4) year Bachelor's degree and Five (5) years of construction loss control or construction safety experience; OR
  - (b) Ten (10) years of construction loss control or construction safety experience, AND
- (2) Current certifications as listed below in a, b, and c:
  - (a) OSHA 510 or equivalent 30 hours of construction safety training.
    - Trenching and Excavation (Standards- 29 CFR- 1926.651)
    - Confined Space Entry (Standards- 29 CFR- 1910.146 App. E), AND
  - (b) Traffic Control/flagging (Certified GDOT flagger), AND

(c) First Aide/CPR/AED (Standards- 29 CFR- 1910.266 (App. B)).

#### GC-18.7 Loads

Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

#### GC-18.8 Emergencies

In any emergency affecting the safety of persons or property, Contractor shall act, at Contractor's discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by Contractor on account of emergency Work shall be determined as provided in the Agreement Documents, including GC-26 and GC-41.

#### GC-18.9 Miscellaneous

##### GC-18.9.1

Contractor acknowledges that it is fully aware of appropriate and safe procedures regarding blasting, including the contents and requirements of Official Code of Georgia Annotated § 25-9-1 through § 25-9-12, Blasting or Excavating Near Underground Gas Pipes and Facilities, any amendments thereto and rules and regulations issued pursuant thereto, and Contractor shall fully comply therewith. Contractor agrees and acknowledges that any failure on its part to adhere to appropriate procedures and said laws, rules and regulations shall not only be a violation of law but shall also be a breach of Agreement.

##### GC-18.9.2

Contractor acknowledges that it is fully aware of appropriate and safe procedures regarding high voltage lines, including the contents and requirements of Official Code of Georgia Annotated § 46-3-30 through § 46-3-39, Safeguards Against Contact with High Voltage Lines, any amendments thereto and rules and regulations issued pursuant thereto, and Contractor shall fully comply therewith. Contractor also confirms that representatives of Contractor have visited the site of the Work and have taken into consideration the location of all electric power lines on and adjacent to all areas onto which the Agreement Documents require or permit Contractor to Work, to store materials or to stage operations, and that Contractor has obtained from the owner or owners of the aforesaid electric power lines advice in writing as to the amount of voltage carried by the aforesaid lines. Contractor agrees that any failure on its part to adhere to appropriate procedures and said laws, rules and regulations shall not only be a violation of the law but shall also be a breach of Agreement.

##### GC-18.9.3

Contractor acknowledges and agrees that he is the person responsible under the law and that he is the person employing or directing others to perform labor within the meaning of

Official Code of Georgia Annotated § 34-1-1, Labor and Industrial Relations. He acknowledges and agrees likewise that he will comply with said law.

#### GC-18.9.4

Contractor shall protect all Work, including but not limited to, excavations and trenches, from rain water, surface water, and backup of drains and sewers. Contractor shall furnish all labor, pumps, shoring, enclosures, and Equipment necessary to protect and keep the Work free of water.

#### GC-18.9.5

The provisions, terms and conditions of this Section, although very specific, are in no way intended to limit the general requirements hereof or the applicability of laws relating to Work conditions, safety or accident prevention and no specific provision or combination of specific provisions in any of said subsections or in any other parts or sections of the Agreement Documents shall be deemed to limit the obligations or responsibility of Contractor contained in general provisions with respect thereto or in laws, statutes, acts, rules or regulations which are applicable thereto but which are not specifically referred to in any part of the Agreement Documents.

### **GC-19 USE OF PREMISES AND CLEAN UP**

#### GC-19.1 Storage, Cleanup and Cutting

Contractor expressly undertakes at no additional cost to the City:

- (1) To store its Materials, Supplies and Equipment at the Site of the Work in such orderly fashion and in such locations as approved by the Engineer that will not unduly interfere with the progress of the Work, or the Work of any other contractors or the activities of City personnel.
- (2) To clean up all refuse, rubbish, scrap materials, and debris caused by its operations to the end that at all times the Site of the Work shall present a neat orderly and workmanlike appearance. No items shall be left or discarded elsewhere on the Site, or any other City sites. Items that are to be discarded shall be removed to approved dump areas.
- (3) To remove all surplus material, false work, temporary structures, including foundations thereof, temporary plants of any description and debris of every nature resulting from its operations, and to put the Site in a neat, orderly condition before final payment. Such final cleanup Work shall be performed within the time specified for completion of Work, with such exceptions as may be approved in writing by the City. Unless otherwise provided in the Specifications, Contractor shall clean any portion of Work for which a separate time for completion is



specified and the Site thereof to the above standards within the specified time, with such exceptions as may be approved in writing by the City.

- (4) To effect all cutting, fitting or patching of its Work required to make the same to conform to the Plans and Specifications and except with the consent of the City, not to cut or otherwise alter the Work of any other contractor.

#### GC-19.2 Protection and Use of Site

Contractor shall, at no additional cost to the City:

- (1) Coordinate all of Contractor's operations with, and secure approval from, the City before using any portion of the Site. Contractor shall assume full responsibility for any damage to any such land or area, or to the City or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the Work.
- (2) Cause its agents and employees to park their vehicles only at locations directed by the City. Contractor's agents and employees shall clean vehicles leaving the Site so as not to muddy roads in the vicinity of the Site. Vehicles shall be brought to the Site only in connection with necessary Work on the Project. In no event shall vehicles be brought to the Site outside normal working hours unless the City gives specific written permission in advance.
- (3) In connection with Contractor's operations, provide for the free flow of traffic over roads or streets in or adjacent to the Site. Contractor shall keep roads and streets free from obstructions of any character that might present a hazard or interference with traffic and in such condition that traffic can be adequately accommodated. When operations in connection with the Work necessitates the closing of traffic lanes, Contractor shall arrange in advance with the City, any adjacent property owners affected, and appropriate local authorities for such closing and shall provide as necessary appropriate barricades, signs, markers, flares and other devices and flagmen as may be required by the Engineer or the local authorities for traffic guides and public safety.
- (4) Provide facilities for its use and only at locations approved or directed by the City. Unless otherwise specified in the Agreement Documents, Contractor shall provide all power and lighting necessary for its Work, complying in all cases with local and national electrical codes, OSHA regulations, and any other applicable laws. The City shall direct the point or points to be used for service connection. Contractor shall provide telephone facilities for its own use and only at locations approved or directed by the City.
- (5) Unless otherwise specifically provided in the Agreement Documents, Contractor shall provide its own temporary facilities, including an office and a watertight, closed area for storage and protection of Materials and Equipment to be used for, or incorporated in, the Work, except as specifically agreed in the Agreement

Documents. Contractor's shanties, material storage rooms, field offices and the like will be approved by the City and placed in locations designated by the City. If it becomes necessary during the course of the Work for Contractor to relocate its field operations, it will do so in an expeditious manner and at no additional cost.

- (6) Contractor shall take measures to control the blowing or spreading of dust, smoke, dirt, mud and refuse from its Work to avoid nuisance and inconvenience to others whether on or off the Site. These measures shall be in compliance with, without being limited to, all applicable laws, and shall be subject to the City's approval. Contractor shall furnish all necessary labor and Materials such as water, approved chemicals, and Equipment.
- (7) Contractor shall be responsible for the removal or drainage of all water interfering with the proper prosecution of its Work. It shall, at all times, assure such drainage and shall not be a nuisance or inconvenience to the City, other contractors or their Work, or the occupants or users of any other public or private area on or off the Site. This Article supplements, and does not supersede, any drainage or dewatering called for elsewhere in the Agreement Documents.
- (8) Contractor shall not use permanent installed systems or equipment without permission of the City. If such permission is granted prior to completion of the Work, Contractor shall restore all parts of the system or equipment used by replacing materials, traps, valves, filters, motors, lamps, and the like to the extent that the City considers them to have been damaged or if their usefulness has been impaired or diminished by their temporary use by Contractor.
- (9) No part of any surface shall be loaded during construction with more weight than it can safely bear at the time. Should damage occur through violation of this requirement by Contractor, it shall be solely liable for such damage and any consequence.
- (10) It shall be Contractor's responsibility to receive and unload its Materials and pay all charges therefor, including, without limitation, demurrage or charges for delays in loading. Contractor shall instruct vendors or Suppliers making such deliveries exactly where they shall go. Contractor shall constantly keep the City advised of its Material delivery schedule and shall update it as required by the City so that Materials will be available to complete the Work on time. Contractor shall schedule Material deliveries so as to interfere as little as possible with anyone else's Work on the Project but within the normal Work hours. Contractor shall require that Materials and Equipment delivered shall be identified with Contractor's name, purchase order, and identification numbers. Contractor shall sign for all Materials delivered and shall be responsible for their safekeeping.

## **GC-20 PROTECTION OF AGREEMENT WORK**

Contractor shall be responsible for:

- (1) Maintenance and protection of Work until final completion and acceptance, including, but not limited to, the storage of Materials and Equipment, erection of temporary structures and provisions for drainage as necessary to protect Work from injury, damage or loss;
- (2) Any injury, damage, or loss to Work resulting from the action of the elements or any other cause, irrespective of fault or negligence, excepting only such injury, damage, or loss as is caused solely by the negligence or willful misconduct of the City;
- (3) Protection of its Work and materials and the Work and materials of its Subcontractors or Suppliers from damage or injury from the weather; and
- (4) Exercising due care to avoid injury or damage to the Work of other contractors on site.

Any portion of Work suffering injury, damage, or loss for which Contractor is responsible under 1, 2, 3 or 4, above, will be considered defective and shall be corrected or replaced without additional cost to City.

#### **GC-21 DEFECTS IN THE WORK AND UNAUTHORIZED WORK**

Contractor shall promptly remove from the premises all Work rejected by the City for failure to comply with Agreement Documents, whether incorporated in the construction or not, and Contractor shall promptly replace and re-execute the Work in accordance with the Agreement Documents and without expense to City and shall bear the expense of making good all Work of other contractors destroyed or damaged by such removal, or replacement. All removal and replacement Work shall be done at Contractor's expense.

If Contractor defaults or neglects to carry out all or any part of the Work in accordance with the Agreement Documents, and fails within three (3) working days after receipt of Written Notice from the City to commence and continue correction and cure of such default, noncompliance, or neglect with diligence and promptness, the City may, after twenty-four (24) hours following receipt by Contractor of an additional Written Notice and without prejudice to any other remedy the City may have, make good such deficiencies and may further elect to perform and to complete all or any part of Work thereafter through such means as the City may select, including the use of a new or supplemental contractor. In such case an appropriate Change Order shall be issued deducting from the payments then or thereafter due Contractor, the cost of correcting such deficiencies. If the payments then or thereafter due Contractor are not sufficient to cover such amount, Contractor shall pay the difference to the City on demand.

Minor, inconsequential defects may be waived in writing by the City, but the City's failure or refusal to exercise such authority shall not be subject to claim by Contractor. If a waiver (whether

minor or major, consequential or inconsequential) will result in an appreciable saving of costs to Contractor, including costs of Work in place and savings when compared to potential costs of rejection and replacement under this clause, it will be made only upon an equivalent adjustment in compensation.

## **GC-22 GUARANTEE OF WORK AND MATERIALS**

### **GC-22.1 Warranty of Materials, Equipment and Work**

Contractor warrants to the City and the Engineer that all Materials and Equipment furnished under this Agreement will be new and of workmanlike quality unless otherwise specified, and that all Work will be of good quality, free from faults and defects and in conformance with the Agreement Documents. All Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Engineer, Contractor shall furnish satisfactory evidence as to the kind and quality of Materials and Equipment. This warranty is not limited by any other provision of the Agreement Documents. The Warranties set forth in this Article and elsewhere in the Agreement Documents shall survive final acceptance of the Work. All warranties are in addition to the rights, remedies, and redress that the City has at law or in equity, and none of Contractor's warranties shall be deemed a sole or exclusive remedy to the City.

### **GC-22.2 Warranty of Continued Liability of Electronics**

Contractor shall warrant to Owner that all goods or equipment which Contractor is required to purchase under the Agreement and which contain embedded codes, chips, microprocessors, microcontrollers, clock circuits (including integrated circuits), computer operating systems, computer software, custom application programming, or other similar systems/technologies that calculate date or time data shall correctly and without failure, malfunction, or need for operator intervention, display, calculate, compute, and process date or time data before, during, and beyond any changes in the date, including leap year, and including changes at year end, decade end, and century end, as needed.

### **GC-22.3 Guarantee and Repair**

If within one (1) year after the Date of Final Completion and Final Acceptance of the Work by the City, or within such longer period of time as may be prescribed by law or by the term of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective or not in accordance with the Agreement Documents, Contractor shall correct it promptly after receipt of a Written Notice from the City to do so. This obligation shall survive both final payment for the Work or designated portion thereof and termination of the Agreement. The City shall give such notice promptly after discovery of the condition. Contractor acknowledges that this one (1) year period provides a period during which Contractor has a duty to repair and does not in any way limit Contractor's liability for Work that is not in accordance with the Agreement

Documents, including any that may be discovered more than one (1) year after the Date of Final Completion and Final Acceptance.

#### GC-22.4 Manufacturer Warranties

Without limiting the responsibility or liability of Contractor under the Agreement, all warranties given by manufacturers on Materials or Equipment incorporated in the Work are hereby assigned by Contractor to the City at no additional cost to the City. If requested, Contractor shall execute enforceable formal assignments of said manufacturer's warranties to the City at no additional cost to the City. Contractor shall not obtain any Materials or Equipment under warranties, which do not run directly to the benefit of the City, and all such warranties shall be directly enforceable by the City, but Contractor understands and agrees that it is jointly and severally liable with the manufacturers for any warranties provided.

#### GC-22.5 Non-Exclusive Nature of Warranties

The foregoing warranties, and those contained elsewhere in the Agreement Documents or implied by law, shall be deemed cumulative and not alternative or exclusive. No one or more of them shall be deemed to alter or limit any other.

### **GC-23 TERMINATION OF AGREEMENT**

#### GC-23.1 Termination for Contractor Default

If Contractor becomes insolvent, or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of Contractor's insolvency, or if Contractor refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper Materials, or fails to make prompt payment to Subcontractors or for Materials or labor, or disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a material violation of a provision of the Agreement Documents so as to be in material breach and default of the Agreement, then City may terminate the Agreement for default, either in whole or in part, without prejudice to any other right or remedy the City may have after giving Contractor and its surety seven (7) days to cure the default. For purposes of this Article, a material violation shall include, without limitation, any violation of or failure to comply with any obligation of the Agreement which the City, in its sole discretion, determines is likely to result in any damage to the City, the Work, or any public or private interest.

If the surety and/or Contractor does not cure the default within seven (7) days from the date of the mailing to Contractor and the surety of notice of default, City may, without further notice, terminate for default and may take over Work and prosecute the same to completion by contract or by Force Account or by whatever means it deems appropriate for the account and the expense of Contractor and Contractor and its surety shall be liable to City for any excess cost incurred thereby, and in such event City may take possession of and utilize in completing Work, such materials, appliances, and plant as may be on the Site of Work and necessary therefore. Upon such termination Contractor shall:

- (1) Preserve all Materials, Drawings and records and Plans at Site of the Work until notified in writing of those items that will be used in completing Work.
- (2) Remove from Site of the Work all construction materials, equipment and plant not designated for use in such notice.
- (3) Assist the City in making an inventory of all Materials and Equipment in storage at the Site of Work, in route to the Site of Work, in storage or manufactured at other locations, and on order from Suppliers.

The City shall further have the right to declare a default without terminating the Agreement for default in whole or in part. In such event, the City shall have the right, at its sole discretion, to supplement Contractor's forces if the City so chooses and deduct the cost of same from the amounts otherwise due Contractor. The City's failure to declare a default or terminate the Agreement in whole or in part shall not determine whether Contractor is, in fact, in material breach of the Agreement because the City shall also have the option to allow Contractor's defective performance to continue and collect such damages as the City may incur from Contractor and its surety.

In the event that the City incurs costs or expenses in performing or completing any portion of Contractor's scope of Work, the City's actual damages shall, at the City's discretion, include a fee up to 15% of such actual costs for performing such work. Such fee shall be computed on the actual costs incurred by the City for labor, materials, equipment, services, administrative and personnel costs and additional design and professional consulting fees, incurred as a result of Contractor's default.

Contractor acknowledges and agrees that an appropriate termination for default is adequate grounds for Contractor's disqualification from future City contracts. This provision shall survive the expiration or termination of this Agreement and any amendments to this Agreement.

In the event any termination for default is found to be wrongful or improper, Contractor agrees that its sole and exclusive remedy is to have the termination treated as a termination for convenience in accordance with the provisions of this Agreement.

#### GC-23.2 City's Right to Stop the Work

If Contractor fails to correct defective Work as required by the Agreement Documents, or fails to carry out the Work or supply labor or Materials in accordance with the Agreement Documents, or otherwise fails to meet or satisfactorily complete any of its obligations under this Agreement, the City, in writing, may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City and the Engineer to stop the Work shall not give rise to any duty on the part of the City to exercise this right for the benefit of Contractor or any other person or entity. Contractor shall not be entitled to any extension of time or for compensation of any sort in the event that the City stops work pursuant to this provision.

### GC-23.3 Intentionally Omitted

### GC-23.4 Termination for Convenience of City

#### GC-23.4.1

The City may, at any time upon ten (10) days Written Notice to Contractor, terminate (without prejudice to any right or remedy of the City) the whole or any portion of the Work for the convenience of the City.

#### GC-23.4.2

If, after Contractor has been terminated for default, it is determined that Contractor was not in default or that the termination for default was improper for any reason, then such termination shall be considered a termination for convenience.

#### GC-23.4.3

If the City terminates the whole or any portion of the Work for convenience, then the City shall only be liable to Contractor for those costs reimbursable to Contractor in accordance with Article 23.4.4; provided, however, that if it reasonably appears to the City that Contractor would have sustained a loss on the entire Agreement had it been completed, no profit shall be included or allowed hereunder and an appropriate adjustment shall be made reducing the amount of settlement so that Contractor's loss on the portion of the Agreement it did perform is proportioned, from a percentage completion basis, to the loss Contractor would have sustained on the entire Agreement. In no event shall Contractor be entitled to anticipated profit on work not performed. Contractor shall, however, be entitled to any profit earned on the work performed to date, but Contractor acknowledges (1) that unit rates may be subject to adjustment, either upward or downward, based upon the variation in estimated quantity provisions of this Agreement, and (2) if the City determines that Contractor's schedule of values was materially unbalanced (or "front-end loaded"), payments previously made to Contractor shall be refunded to the City or withheld from amounts otherwise due Contractor. The intent of this Article is to avoid any Contractor windfall at the City's expense while at the same time preserving the benefit of the bargain, either positive or negative, for Contractor.

#### GC-23.4.4

If the City terminates the whole or any portion of the Work for convenience, the City shall pay Contractor the amounts determined by the Engineer as follows:

- (1) To the extent not previously paid for, Contractor shall be paid on a percentage completion basis in accordance with any approved schedule of values for the value of the work completed to date, including items such as mobilization and general conditions costs (based on percent complete).

- (2) To the extent not previously paid for and to the extent that the Agreement Documents call for payment on the basis of unit rates, Contractor shall be paid for all work actually performed at the unit rate established in the Agreement Documents, with such adjustment, if any, as may be required either upward or downward by the variation in estimated quantity provisions applicable to unit rates under the Agreement.
- (3) The reasonable costs of settlement, including accounting, clerical, and other expenses reasonably necessary for the preparation of settlement claims and supporting data with respect to the terminated portion of the Agreement and for the termination and settlement of subcontracts thereunder, together with reasonable storage, transportation, and other costs incurred in connection with the protection or disposition of property allocable to this Agreement. This amount shall not include any attorneys' fees or other legal costs or claim preparation costs or expert or consulting fees, and Contractor shall not be entitled to recovery or compensation of any such costs or fees under any circumstances.

#### GC-23.4.5

Contractor shall specifically require its Subcontractors and suppliers and those with whom they contract to agree to the provisions of this Article governing termination for convenience. In no event shall the City be responsible for anticipated profit on work not performed or "restocking charges." The City's potential liability for convenience termination costs shall be based on work actually performed and costs actually incurred, provided that the termination shall not in any event transform a Contractor or Subcontractor's probable net loss position into a profitable or "cost plus" recovery.

### GC-23.5 General Termination Provisions

#### GC-23.5.1

If the City terminates the whole or any part of the Work for default, then the City may procure, upon such terms and in such manner as the City may deem appropriate, supplies or services similar to those so terminated, and Contractor shall be liable to the City for any excess costs for such similar supplies or services. Contractor shall continue the performance of this Agreement to the extent not terminated hereunder.

#### GC-23.5.2

In the event of a Contractor default under any of the provisions of the Agreement, after written notice and a failure to cure within seven (7) days of that notice, Contractor and its surety shall be responsible to pay to the City such reasonable attorneys' fees as the City may expend as a result of the default, including all costs, expenses and filing fees incidental thereto, including, without limitation, expert fees, consultants' fees, arbitrator fees (if any), and prejudgment interest at the commercial account rate on all sums due, whether



liquidated or unliquidated. Any judgment or arbitration award entered in favor of the City against Contractor or its surety shall bear interest from the time of entry of the judgment or the date of the arbitration award at the commercial account rate.

### GC-23.5.3

After receipt of a notice of termination from the City, whether for default or for convenience, and except as otherwise directed by the City, Contractor shall:

- (1) Stop Work under the Agreement on the date and to the extent specified in the notice of termination;
- (2) Place no further orders or subcontracts for Materials, services, or facilities, except as may be necessary for completion of such portion of the Work under the Agreement as is not terminated;
- (3) Terminate all orders and subcontracts to the extent that they relate to the performance of Work terminated by the notice of termination and are not assigned as set forth below;
- (4) If so requested by the City, assign to the City in the manner, at the times and to the extent directed by the City, all of the rights, title, and interest of Contractor under the orders and subcontracts so selected and requested for assignment;
- (5) Settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the City to the extent the Engineer may require, in accordance with the provisions of this Agreement;
- (6) Transfer title and deliver to the entity or entities designated by the City, in the manner, at the times and to the extent, if any, directed by the City, and to the extent specifically produced or specifically acquired by Contractor for the performance of such portion of the Work as has been terminated:
  - (a) The fabricated or unfabricated parts, Work in progress, partially completed supplies, and Equipment, Materials, parts, tools, dies, jigs, and other fixtures, completed Work, supplies and other material produced as part of, or acquired in connection with the performance of the Work terminated by the notice of termination; and
  - (b) The completed or partially completed Plans, Drawings, information, and other property related to the Work, including as-built information;
- (7) If so requested by the City, use best efforts to sell for the benefit of the City, in the manner, at the times, to the extent, and at the price or prices directed or authorized by the City, any property of the types referred to in Article GC-23.5.3(6); provided, however, that Contractor:

- (a) Shall not be required to extend credit to any buyer; and
  - (b) May re-acquire any such property under the conditions prescribed by and at a price or prices approved by the City; and, provided, further that the proceeds of any such transfer or disposition shall be applied in reduction of any payments to be made by the City to Contractor under this Agreement or shall otherwise be credited to the price or cost of the Work covered by this Agreement or paid in such other manner as the City may direct;
- (8) Complete performance of such part of the Work as shall not have been terminated by the notice of termination; and
  - (9) Take such action as may be necessary, or as the City may direct, for the protection and preservation of the property related to the Agreement, which is in the possession of Contractor and in which the City has or may acquire an interest.

#### GC-23.5.4

Contractor shall preserve and make available to the City, at all reasonable times at the office of Contractor, but without direct charge to the City, all its books, records, documents and other evidence bearing on the costs and expenses of Contractor and any Subcontractor or Supplier under the Agreement, and any photographs, microphotographs, or other authentic reproductions thereof and Owner shall have the right at any time to audit the same.

#### GC-23.5.5

In arriving at any amount due Contractor for any termination for default or convenience, there shall be deducted:

- (1) All unliquidated advance or other payments on account theretofore made to Contractor applicable to the termination portion of this Agreement;
- (2) Any claim which the City may have against Contractor;
- (3) Such claim as the Engineer determines to be necessary to protect the City against loss because of outstanding or potential claims of any type or nature; and
- (4) The agreed price for, or the proceeds of sale of, any Materials, supplies, or other things acquired by Contractor or sold, pursuant to the provisions of Article GC-23.5.3(7) and not otherwise recovered by or credited to the City.

#### GC-23.5.6

Contractor shall refund to the City any amounts paid by the City to Contractor in excess of Contractor's entitlement specified hereunder.

#### GC-23.5.7

The City may, at its option, have costs audited and certified by independent certified public accountants selected by the City.

#### GC-23.5.8

Contractor shall be entitled to only those damages and that relief from termination by the City as specifically provided hereunder.

### **GC-24 SUSPENSION OF WORK**

#### GC-24.1 Right to Suspend Work

The City may order Contractor, in writing, to suspend, delay, or interrupt all or any part of the Work for such period of time as the City may determine to be appropriate for the convenience of the City.

#### GC-24.2 Rights Upon Certain Unreasonable Suspensions

If the performance of the Work is, for an unreasonable period of time, suspended, delayed, or interrupted by an act of the City or Engineer in the administration of the Agreement, or by failure of any one of them to act within the time specified in the Agreement (or if no time is specified, within a reasonable time), or by any act of either of them which is attributable to their fault or neglect, adjustment shall be made in the Agreement Time only for any extension in the time required for performance of the Work necessarily caused by such unreasonable suspension, delay, or interruption and the Agreement modified in writing accordingly. However, no adjustment shall be made under this Article for any suspension, delay, or interruption for which an adjustment is provided or excluded under any other provision of the Agreement Documents, and no adjustment shall be made to the extent that performance would have been so suspended, delayed or interrupted by any other cause, including the fault or negligence of Contractor or excusable delays that are unforeseeable and not attributable to the fault or neglect of the City or Contractor and beyond the control of each of them. No claim for a time adjustment under this Article shall be allowed unless it is presented in accordance with the provisions of the Agreement governing Claims and compliance with the claims provision shall be a condition precedent to the right to a time adjustment.

#### GC-24.3 Damages Upon Suspension

Nothing contained in this Article authorizes the recovery of delay or impact damages, except as expressly authorized in this Agreement; and compliance by Contractor with the claims provision shall be a condition precedent to the right to any Contract adjustment on account of a suspension

of the Work. Contractor expressly agrees that it shall not be entitled to any increase in the Agreement Price or to any monetary damages on account of a suspension, delay, interruption, interference or impact, unless the notice, documentation, and pricing requirements of this Agreement have been met.

#### GC-24.4 Time Extension Upon Suspension

Under the terms of this Agreement, in order for Contractor to receive extensions of time for excusable delays, the delays must (i) be on the critical path, (ii) be beyond the reasonable control of Contractor and those for whom it is responsible including its Subcontractors and Suppliers and others working by or through them, (iii) not be attributable to any factor for which Contractor has assumed the risk of performance (such as labor availability), (iv) not be attributable in whole or in part to Contractor's fault or neglect or the fault or neglect of those for whom Contractor is responsible, including Subcontractors and Suppliers and others working by or through them, and (v) not be concurrent with non-excusable delays that are on the critical path. If Contractor meets these five (5) requirements, then Contractor's sole remedy for such delay shall be an extension of the Agreement Time for the period of time during which all five (5) elements continue to be met, which shall be implemented by Change Order; provided, however, Contractor shall not be entitled to any extension of the Agreement Time (i) if Contractor fails to comply with notice requirements in the Contract, (ii) if such delays do not cause Contractor to achieve Substantial Completion of the entire Work later than the then current Substantial Completion Date, or (iii) if Contractor fails to work around such delay where such work around was available to Contractor. In all events, Contractor must comply with the notice and claim provisions set forth in this and other provisions of the Agreement in order to be entitled to any extension of the Agreement Time.

#### GC-24.5 Damages for Non-Excusable Delays

Under the terms of this Agreement, liquidated or actual damages (as specified in the Agreement and as appropriate) shall be assessed for all non-excusable delays. Unless and until Contractor satisfies its obligations under and satisfies all criteria set forth in GC-24.4, delays shall be deemed non-excusable. The burden of proof shall be upon Contractor to establish that delays and untimely completion are attributable to excusable delays.

#### GC-24.6 Abnormal Weather

Abnormal weather may constitute an excusable delay if other requirements for excusable delays are met (for example, weather-sensitive work must be on the critical path.) The Agreement Time will not, however, be extended due to normal inclement weather. Unless Contractor can substantiate that there was greater than normal inclement weather using a ten (10) year average of accumulated record mean values from climatological data compiled by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration for Atlanta, Georgia, and that such alleged greater than normal inclement weather qualifies as excusable delay as set forth above, Contractor shall not be entitled to an extension of time. In no event will "dry-out" delay days be allowed. Any time extension shall be based on the number of additional days of adverse weather and not upon the time required to recover from said weather.

**GC-24.7 Impacts From Adjacent Property**

Contractor acknowledges and agrees that it will be interacting with numerous citizens and residents of the City and will be working in close proximity to their homes, businesses, and private property. Contractor warrants that it has made due allowance for dealing with the concerns and complaints of these citizens and residents and any delays, interruptions, interferences, disruptions, or other impacts resulting therefrom. Contractor further warrants and agrees that it will fully cooperate with the City to minimize the adverse affects of the Project on the City's residents by resequencing work or adjusting its means, methods, techniques, and procedures to minimize and mitigate the effect upon the City's residents and that the cost of these mitigation efforts has been included in Contractor's price to the City.

**GC-25 COMMENCEMENT AND PROSECUTION OF THE WORK**

Contractor shall, within ten (10) days after receipt from the City of a written Notice to Proceed, commence Work to be done under this Agreement. Contractor shall diligently prosecute Work and all portions thereof to completion within the times specified therefor. The capacity of Contractor's construction and manufacturing equipment and plans, sequence and methods of operations, and forces employed, including management and supervisory personnel, shall be such as to ensure completion of Work within the specified time.

It is expressly understood and agreed by and between Contractor and City that Agreement Time for the completion of Work described herein is a reasonable time, taking into consideration the unique requirements of the Work (including performance of the Work in close proximity to the private property of the citizens and residents of the City), the average climate and economic conditions in the area, and other factors prevailing in the locality of the Work (such as, without limitation, the availability of labor, equipment and materials).

**GC-26 TIME****GC-26.1 Progress and Completion****GC-26.1.1**

All time limits stated in the Agreement Documents are of the essence of the Agreement.

**GC-26.1.2**

Contractor shall begin the Work within ten (10) days after the issuance of written Notice to Proceed. Contractor shall carry the Work forward expeditiously with adequate forces and shall achieve Substantial Completion of the Work and Final Completion within the times stated in the Agreement Documents.

**GC-26.2 Delay, Damages, and Extensions of Time**

GC-26.2.1

Contractor shall not be entitled to payment or compensation of any kind from the City for direct, indirect, impact, or delay damages, including but not limited to costs of delay, disruption, interference, impact or hindrance from any cause whatsoever, whether such delay, disruption, interference, impact or hindrance be reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable, except as expressly provided in this Agreement.

In any and all events, the City's liability for damages for delay, disruption, interference, impact or hindrance shall be limited to the following actual direct job site related costs that are solely incurred as a function of time: (1) costs of job site supervision, (2) direct cost of general conditions items, including job site office expenses for trailer rental, telephone, electricity, heat, and water, (3) except for tunnel boring machines which shall be governed by the terms of GC-41.6, equipment expenses at the Force Account rates specified in the provisions of this Agreement governing changes; and (4) a markup for profit and overhead on actual direct costs, in accordance with the Force Account rates specified in the provisions of this Agreement governing changes.

GC-26.2.2

The Agreement Time shall be adjusted only for excusable delays. In the event Contractor requests an extension of the Agreement Time, it shall furnish such justification and supporting evidence as the City may deem necessary for a determination as to whether Contractor is entitled to an extension of time under the provisions of the Agreement. The City, after receipt of such justification and supporting evidence, shall make a decision thereon and shall advise Contractor in writing thereof. If the City finds that Contractor is entitled to any extension of the Agreement Time, the City's determination as to the total number of days' extension shall be based upon the current CPM and on all data relevant to the extension as described in the Agreement Documents. Contractor acknowledges and agrees that delays in activities that according to the approved and current CPM Schedule do not affect the critical path do not have any effect upon the Agreement Time and therefore will not be the basis for a change thereof.

GC-26.2.3 [Intentionally Omitted]GC-26.2.4 [Intentionally Omitted]GC-26.2.5 [Intentionally Omitted]GC-26.2.6 [Intentionally Omitted]

GC-26.2.7

In order for Contractor to be entitled to any extension of the Agreement Time, Contractor must comply with the Claim provisions of GC-41 and GC-26. Such statement of the claim, in addition to complying with all other provisions of the Agreement relating to Claims and delays, must provide all information required by the scheduling requirements of the Agreement Documents and further provide the following specific information:

- (1) Nature of the delay;
- (2) Date (or anticipated date) of commencement of delay;
- (3) Activities on the approved current CPM Schedule affected by the delay, and/or new activities created by the delay and their relationship with existing activities;
- (4) Identification of person(s) or organization(s) or event(s) responsible for the delay;
- (5) Anticipated extent of delay; and
- (6) Recommended action to avoid or minimize the delay.

GC-26.2.8

The City shall receive and process such claims for extensions of time in accordance with the procedures set forth in Article GC-41, except that any Change Order issued shall only amend the time for completion.

GC-26.2.9

The failure of Contractor to file any claims for extension of time within the time limits prescribed and in the form and manner required shall be deemed a material prejudice to the interests of the City in canceling and mitigating such impacts, and shall constitute an absolute waiver of the claim and the right to file or thereafter prosecute the same. The purpose of the time limits, notice and form and manner requirements are, in part, to eliminate disputes over the existence, scope, and nature of events giving rise to claims, and the failure to abide by same will result in material prejudices to the City, even if the City were otherwise on notice of facts giving rise to the claim because, in part of the impact to the City's ability to document, dispute, or resolve issues as they arise, and also because of the impact to the City's efforts to entirely avoid disputes over claims not asserted in accordance with the Agreement Documents.

GC-26.2.10

If no schedule or agreement is made stating the date upon which written interpretations as set forth in the Agreement Documents shall be furnished, then no claim for delay shall be allowed on account of failure to furnish such interpretations until fifteen (15) days after demand is made for them, and not then unless such claim is reasonable.

## **GC-27 RESPONSIBILITY FOR COMPLETION**

### **GC-27.1 Duty to Accelerate**

Subject to the other provisions of the Agreement Documents, Contractor shall furnish such manpower, Materials, facilities, and Equipment and shall work such hours, including night shifts, overtime operations and Sundays and holidays, as may be necessary to ensure the prosecution and completion of the Work in accordance with the approved and currently-updated CPM Schedule. If Work actually in place falls behind the currently updated and approved CPM Schedule, and it becomes apparent from the current approved CPM Schedule that the Work will not be completed within the Agreement Time, Contractor agrees that it will, as necessary or as directed by the City, take some or all of the following actions at no additional cost to the City to improve its progress:

- (1) Increase manpower in such quantities and crafts as will eliminate, in the judgment of the City, the delay and backlog of Work;
- (2) Increase the number of working hours per shift, shifts per working day, working days per week, the amount of equipment or any combination of the foregoing, sufficiently to eliminate in the judgment of the City, the delay and backlog of Work;
- (3) Reschedule activities as necessary to eliminate in the judgment of the City the delay and backlog of Work; and
- (4) Any other measure required by the schedule requirements of the Special Conditions.

In addition, the City may require Contractor to submit a proposed revised CPM Schedule Recovery Plan demonstrating its program and proposed plan to make up lag in scheduled progress and to ensure completion of the Work within the Agreement Time. If the City finds the proposed plan not acceptable, the City may require Contractor to submit a new and/or revised plan with direction and other input from the City and Engineer.

### **GC-27.2 Recoverable Acceleration Expenses**

In the limited and exclusive event that (1) the City directs Contractor to accelerate, and (2) it is subsequently determined that Contractor was entitled to time extensions for excusable delays which the City failed or refused to grant, and (3) Contractor in fact succeeds in accelerating substantial completion of the Project by substantially completing the Project significantly and materially sooner than what would have been the case had the City granted all time extensions to which Contractor was entitled, then, and only then, Contractor may be entitled to recoverable



acceleration expenses as defined below if Contractor properly and timely complies with the provisions related to time, notice and form and substance of claims of the Agreement (including, without limitation, Articles GC-24, GC-26, and GC-41) Recoverable acceleration expenses shall be limited to the following without any markup for overhead and profit:

- (1) the premium portion only of overtime costs for hours worked in a single week that exceed 40 hours per week
- (2) if the overtime continues for more than 65% of the skilled labor on the site (including subcontractor personnel) for a continuous period of 8 weeks or more, then beginning in the 9<sup>th</sup> week, a multiplier of 10% of the premium portion of the overtime costs may be added as recoverable acceleration expenses to cover the cost of any loss or damage or additional expense resulting from the acceleration.

No expenses other than the two items noted above shall be allowed as recoverable acceleration expenses. No claims for acceleration for work that is not on the critical path shall be permitted.

#### GC-27.3 Acceleration by City's Forces

Failure of Contractor to substantially comply with the requirements of Article GC-27.1 may be considered grounds for a determination by the City and/or the Engineer that Contractor is failing to prosecute the Work with such diligence as will ensure its completion within the time specified. In such case, upon forty-eight (48) hours prior Written Notice to Contractor, City shall have the right to furnish such additional labor and Materials as may be required to comply with the schedule, and Contractor shall be liable for such costs incurred by City as provided elsewhere in this Agreement.

#### GC-27.4 Set-Off of Acceleration Costs

Any monies due to the City under this Article may be set-off by the City against monies due from the City to Contractor.

#### GC-27.5 Acceleration Remedies Cumulative

The remedies of the City set out in this Section are in addition to, and without prejudice to, all other rights and remedies of the City including those stated elsewhere in the Agreement Documents. The remedies of Contractor, however, are sole and exclusive and contingent upon compliance with the Agreement provisions as to time, notice, form, and substance of Claims, including, without limitation, Articles GC-24, GC-26, and GC-41.

## **GC-28 WORKING DRAWINGS, SHOP DRAWINGS, DATA ON MATERIAL AND EQUIPMENT, SAMPLES, AND LICENSES**

### **GC-28.1 General**

#### **GC-28.1.1**

Contractor shall submit to the Engineer for review and exception, if any, such working Drawings, Shop Drawings, test reports and data on Materials, licenses, and Equipment (hereinafter in this article called data), and material samples (hereinafter in this article called samples) as are required for the proper control of Work, including but not limited to, those working Drawings, Shop Drawings, data and samples specifically required elsewhere in the Specifications and Agreement Documents. Submittals are required for any product that becomes a part of, or affects, the permanent Work.

#### **GC-28.1.2**

Data on Materials and Equipment include, without limitation, Materials and Equipment lists, catalog data sheets, cuts, diagrams and similar descriptive material. Materials and Equipment lists shall give, for each item thereon, the name and location of the Supplier or manufacturer, trade name, catalog reference, size, finish and all other pertinent data.

#### **GC-28.1.3**

It is the duty of Contractor to check all Drawings, data and samples prepared by or for it before submitting them for review. Drawings and schedules shall also be checked and coordinated with the Work of all trades involved. Drawings and other submittals originating from Subcontractors will be reviewed and checked similarly by Contractor. Pursuant to this required review, Contractor shall indicate its approval, before they are submitted for review by the City, by affixing its stamp of approval, properly initialed and dated. All submittals shall be referenced to the applicable item, section or division of the Specifications.

#### **GC-28.1.4**

The Engineer's review of Drawings, data and samples submitted by Contractor will cover only general conformity to the Specifications, external connections, and dimensions which affect the installation. The Engineer's review and exception, if any, will not constitute an approval of dimensions, quantities, and details of the Material, Equipment, device, or item shown.

GC-28.1.5

Contractor shall not begin any of the Work covered by a Drawing, data, or a sample returned for correction until a revision or correction thereof has been reviewed and returned to it.

GC-28.1.6

The CPM Schedule shall include respective dates for the submission of shop and work Drawings, the beginning of manufacture, testing, and installation of Materials, Supplies, and Equipment.

GC-28.1.7

Acceptable submittals will be marked "No Exceptions Taken." Submittals requiring minor corrections before the Material or Equipment is acceptable will be marked "Make Corrections Noted." Contractor may order, fabricate, or ship the items included in the submittal, provided the indicated corrections are made. Drawings must be resubmitted for review prior to installation of Equipment or use of Materials, unless otherwise directed in writing by the Engineer.

GC-28.1.8

Submittals marked "Amend and Resubmit" must be revised to reflect required changes, and the initial review procedure repeated.

GC-28.1.9

The "Rejected - See Remarks" notation is used to indicate Materials or Equipment that are not acceptable. Upon return of a submittal so marked, Contractor shall repeat the initial review procedure utilizing acceptable Materials or Equipment.

GC-28.1.10

Drawings on other submittals not bearing the Engineer's "No Exceptions Taken" notation shall not be issued to Subcontractors or utilized for construction purposes. No Work shall be done or equipment installed without a drawing or submittal bearing the "No Exceptions Taken" notation. Contractor shall maintain at the job site a complete set of Drawings and other submittals bearing the Engineer's stamp.

GC-28.1.11

In the event Contractor obtains the City's approval for the use of equipment other than that which is called for in the Agreement Documents, Contractor shall, at its own expense and using methods approved by the City, make any changes to structures, piping and electrical work that may be necessary to accommodate this equipment. If Contractor substitutes any

specified item of Material or Equipment with another item of Contractor's choosing as an "or equal" item, Contractor warrants the accuracy and adequacy of the design and performance of the substituted item and further warrants that it has exercised due diligence to ensure that the substituted item will function properly as a component into the integrated Project of which it is a part.

#### GC-28.1.12

Contractor shall submit all Drawings and schedules sufficiently in advance of construction requirements to provide no less than thirty (30) calendar days for checking and appropriate action.

#### GC-28.1.13

The review of Drawings and schedules will be general, but approval shall not be construed: (a) as permitting any departure from the Agreement requirements; (b) as relieving Contractor of responsibility for any errors, including details, dimensions, and Materials; and (c) as approving departures from details furnished by the City, except as otherwise provided herein.

### GC-28.2 Shop Drawings

#### GC-28.2.1

When used in the Agreement Documents, the term "Shop Drawings" shall be considered to mean fabrication drawings, wiring and control diagrams, cuts, or entire catalogs, pamphlets, descriptive literature, and performance and test data. The Drawings shall be submitted using standard transmittal forms in accordance with detailed instructions furnished by the City. A separate transmittal sheet shall be used for reference to each item, section or division of the Specifications.

#### GC-28.2.2

Contractor shall submit six (6) sets of each Shop Drawing for review. On electrical and instrumentation and control submittals Contractor shall submit seven (7) copies of each for review.

#### GC-28.2.3

Each Shop Drawing shall include the following:

- (1) Number and title of the submittal;
- (2) Date of Drawing or revision;
- (3) Name of Project;
- (4) Name of Contractor and/or Subcontractor submitting Drawing and with its seal of approval;

- (5) Specification title and number; and
- (6) Clear identification of contents and location of the Work.

#### GC-28.2.4

Drawings for Work on utility facilities, streets and other facilities, which are constructed for owners other than the City, shall be coordinated so that information required by these owners is included on the Shop Drawings for their facilities.

#### GC-28.2.5

If Drawings show variations from Agreement requirements, Contractor shall describe such variations in its letter of transmittal. If acceptable, proper adjustment in the Agreement shall be implemented where appropriate. If Contractor fails to describe such variations, it shall not be relieved of the responsibility for executing the Work in accordance with Agreement, even though such Drawings have been reviewed.

#### GC-28.2.6

If the Drawings or schedules as submitted describe variations and show a departure from the Agreement requirements which the City finds to be in the interest of the City and to be so minor as not to involve a change in Agreement Price or Time, the City may return the reviewed Drawings without noting an exception.

#### GC-28.2.7

If no exceptions are taken by the City, each of the Shop Drawings will be identified by being so stamped and dated. Shop Drawings stamped "Rejected - See Remarks" and with required corrections shown, will be returned to Contractor for correction and re-submittal. On re-submittals, Contractor shall direct specific attention, in writing or on resubmitted Drawings, to revisions other than the corrections requested by the City on previous submissions. Contractor shall make any corrections required by the City. If Contractor considers any correction indicated on the drawings to constitute a change to the Agreement Drawings or Specifications, Contractor shall give Written Notice thereof to the City in accordance with GC-41. At least two (2) copies of Drawings or data submittals will be returned to Contractor.

#### GC-28.2.8

When the Drawings or data submittals have been completed to the satisfaction of the City, Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the City.

#### GC-28.2.9

After final review in which there are no exceptions noted or referenced, and before final payment is made, Contractor shall furnish to the City two (2) sets of record Shop Drawings, all clearly revised and completed and brought up to date, showing the permanent construction as actually made and marked FINAL/AS-BUILTS. One (1) set of such Shop Drawings shall be either drawn in ink on tracing cloth, or reproduced on mylar from which clear prints can be made. The other set could be a complete paper print.

#### GC-28.2.10

Contractor shall be responsible for and bear all cost of damages which may result from the ordering of any Material or from proceeding with any part of Work prior to the review, without exception, by the City of the necessary Shop Drawings.

### GC-28.3 Working Drawings

#### GC-28.3.1

When used in the Agreement Documents, the term "Working Drawings" shall be considered to mean Contractor's plans, including a detailed narrative, for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities, ground water control systems, forming and false work; for underpinning; and for such other work as may be required for construction but does not become an integral part of the Project.

#### GC-28.3.2

Copies of Working Drawings shall be submitted to the City where required by the Agreement Documents or requested by the City and shall be submitted at least thirty (30) calendar days in advance of their being required for Work.

#### GC-28.3.3

Working Drawings shall be signed and sealed by an engineer licensed to practice in the State of Georgia and shall convey, or be accompanied by, calculation of other sufficient information to completely explain the structure, machine, or system described and its intended manner of use. Prior to commencing such Work, Working Drawings must have been reviewed to the satisfaction of the City, and each Working Drawing identified by the City with the Engineer's stamp of "No Exception Taken." Review of the Working Drawings by the Engineer will not relieve Contractor in any way from its responsibility with regard to the fulfillment of the terms of Agreement. All risks of error are assumed by Contractor. The City and the Engineer shall have no responsibility therefor.

### GC-28.4 Record Agreement Drawings

Contractor shall keep at least one (1) record copy of all Agreement Documents, reference documents, and all technical submittals at the Site in good order and annotated to show all changes

made during the construction process. Record drawings shall be updated and kept current on a monthly basis by Contractor. The record drawings will be reviewed monthly by the Engineer prior to approval of Contractor's monthly Payment Application. Final "as-built" plans of the Work, shall be satisfactory to the Engineer, and will be provided at Contractor's expense within thirty (30) days following Substantial Completion of the Work or any portion thereof. The provision of such as-built documents satisfactory to the Engineer shall be an express condition precedent to final payment. Upon request, the Engineer will provide one (1) set of reproducibles of the original Agreement Drawings, at no cost, to Contractor within two weeks subsequent to the execution of this Agreement.

#### GC-28.5 Samples

##### GC-28.5.1

Contractor shall furnish at no additional cost, for the approval of the City, samples required by the Agreement Documents or requested by the City. Samples shall be delivered to the City as specified or directed. Contractor shall prepay all shipping charges on samples. Materials or Equipment for which samples are required shall not be used in Work until approved by the City.

##### GC-28.5.2

Each sample shall have a label indicating:

- (1) Name of Project;
- (2) Name of Contractor and Subcontractor;
- (3) Material or Equipment Represented;
- (4) Place of Origin;
- (5) Name of Producer and Brand (if any); and
- (6) Location in Project.

##### GC-28.5.3

Contractor shall prepare a transmittal letter for each shipment of samples containing the information required in Article B above. It shall enclose a copy of this letter with the shipment and send a copy of this letter to the City. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Agreement requirement. Substitutions will not be permitted unless they are considered to be to the City's best interest.

##### GC-28.5.4

Approved samples not destroyed in testing shall be sent to the City or stored at the Site of the Work. Approved samples of the hardware in good condition will be marked for identification and may be used in the Work. Materials and Equipment incorporated in the

Work shall match the approved samples. Samples which failed testing or were not approved will be returned to Contractor at its expense if so requested at time of submission.

#### GC-28.5.5

Contractor will provide architectural samples to the City in a composite color board format for review and color coordination. These samples shall be of the precise Material and color specified and of sufficient size for comparison to other material samples.

#### GC-28.5.6

Custom colors and coatings may be required to complete the Project within acceptable architectural standards. Contractor shall comply with the Architect's selection and provide Materials that precisely match the approved samples.

### GC-28.6 Operation and Maintenance Manuals

#### GC-28.6.1

Operation and maintenance manuals are operator and shop maintenance instructions that enable an average journeyman mechanic without prior knowledge of the specific type, make, or model to maintain and repair the Equipment. The manuals shall include repair parts data that provides positive identification for an item of the complete Equipment with reference to the manufacturer or dealer facilities to identify ordering part numbers in support of procured Equipment.

#### GC-28.6.2 Preparation Instructions

An operation and maintenance manual set is required to cover each specific make, model, year and serial numbered piece of Equipment scheduled for delivery under terms of this Agreement. It is the intent of these requirements to use standard commercial manuals modified to meet the minimum Specification set forth herein. The manuals shall provide instructions, illustrations, and other associated data for operations, preventive and corrective maintenance and repair, including a complete catalog of parts used in the assembly of the end item. The manuals provided shall contain complete instructions and information as set forth below for all Equipment components, assemblies, subassemblies, attachments, and accessories manufactured by the prime Supplier or those purchased by the prime Supplier from other sources and assembled in the finished end item.

#### GC-28.6.3 Contents of Operation and Maintenance Manuals

The contents of complete set of manuals shall include, at a minimum, the following:

- (1) Table of Contents;
- (2) Operating instructions;



- (3) Preventive maintenance, service, and corrective maintenance or repair instructions;
- (4) Parts list with recommended quantity; and
- (5) Approved Shop Drawing(s).

#### GC-28.6.4 Binding and Delivery

The manual(s) shall be bound or otherwise securely enclosed in an oil and moisture resistant binder(s). Each binder cover shall indicate in bold type the manufacturer's name, contract number, model number, and serial number of the unit or equipment. Five (5) copies of the manual(s) shall be delivered with the Shop Drawings and must be approved with the Shop Drawings.

### **GC-29 CONTRACTOR'S TITLE TO MATERIALS**

No Materials or supplies for the Work shall be purchased by Contractor or by any Subcontractor subject to any chattel mortgage, security agreement, or under a conditional sales contract or other agreement by which any security interest is retained by the seller. Contractor warrants that it has good title to all Materials and supplies used in the Work, free from all liens, claims or encumbrances.

### **GC-30 INSPECTION AND TESTING OF MATERIALS**

All Materials and Equipment used in the construction of the Project shall be subject to adequate inspection and testing in accordance with accepted standards and the requirements of the Agreement Documents. The laboratory and inspection agency shall be provided by Contractor and approved by the City for these tests; provided, however, that if the City has already secured the services of identified testing consultants/agencies, then Contractor shall engage the services of the testing consultant/agency designated by the City. Additional tests performed after rejection of Materials or Equipment shall be at Contractor's expense.

Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with Specifications and suitability for uses intended, but failure to inspect Materials will in no way waive the City's right to reject defective Materials or to condemn Work in which they are used. Contractor will provide for travel expenses, factory performed testing and set up costs for the factory inspection and testing of all major architectural elements, mechanical, electrical or process equipment. A factory visit for both designers' representative and a City representative may be required. No funds for stored materials or fabrication items will be released until the factory inspection is completed and a certified Payment Application is submitted.

All tests performed by Contractor shall be witnessed by the City unless the requirement therefor is waived in writing. Contractor shall give the City reasonable advance notice of all such tests. The City may perform additional tests on materials tested by Contractor, and Contractor shall furnish samples for this purpose as requested.

In the event that the City directs additional testing or inspection of the Work and the testing or inspection reveals that the Work is not in accordance with the Agreement Documents, Contractor shall pay for all costs of correction of the Work as well as for all costs of testing and inspection. In the event that any portion of Contractor's Work depends upon the Work of the City or any of its separate contractors, the Contractor agrees that the City's Work or that of its separate contractor is adequate and installed such that it is ready and sufficient in all respects to accept Contractor's Work, unless written notice of any defect or deficiency is provided by the Contractor to the City prior to the Contractor beginning performance of the Work.

### **GC-31 MATERIALS AND EQUIPMENT**

Contractor shall furnish all Materials and Equipment to be incorporated into the Work. Only Materials and Equipment conforming to the requirements of the Drawings and Specifications shall be incorporated into the Work. Except as otherwise specified or approved in specific instances, all such Materials and Equipment shall be new and unused and of the highest quality available. Materials and Equipment for which no specific requirements are given in the Drawings or specifications shall be those best suited for the specified use, considering function, strength, durability and resistance to corrosion. Manufactured Materials and Equipment shall be obtained from sources which are currently manufacturing such Materials or Equipment, except as otherwise approved in writing.

If so ordered by the Engineer, sources of Materials shall be approved by him before delivery from those sources is commenced. Approval of a source of Materials may be withdrawn by the Engineer at any time that the Materials delivered from that source are found to be defective, and Contractor shall thereupon cease all deliveries from that source.

Manufacturer's warranties, certifications, guarantees, manuals, instruction sheets and parts lists provided with Materials and Equipment shall be furnished to the Engineer before final payment is made and receipt of same is a condition precedent to any obligation to make final payment.

### **GC-32 STORAGE OF MATERIALS AND EQUIPMENT**

Materials and Equipment to be incorporated in the Work shall be stored in such a manner as to preserve their quality and fitness for incorporation in the final project. They shall be stored in a manner acceptable to the Designer and Owner and in an accessible facility that allows inspection. If at any time the City determines that any Materials or Equipment are not being properly stored, they may issue a directive to correct the storage or reject the Material for incorporation in the Project. No additional payment will be made for storage requirements. No payment will be made on Materials stored improperly or replaced due to improper storage.

No Equipment may be stored outside without the express written permission of the City on that specific piece of equipment stating that unit's unique I.D. numbers.

For any Equipment or units that have rotating parts or bearing assemblies and must be stored for more than sixty (60) days, Contractor shall set up a schedule to manually rotate the units every fifteen (15) days and maintain a certification log to preserve the service life and warranties.

### **GC-33 REPORTS, RECORDS, AND DATA**

#### **GC-33.1 General**

Contractor shall submit to the City schedules of quantities and costs, progress schedules, reports, estimates, records, certificates, and other data as the City may request concerning Work performed or to be performed under this Agreement.

#### **GC-33.2 Payroll Reports**

Contractor shall be required to furnish weekly payroll reports to the City, certifying conformance with the wage rates listed in the Specifications. The requirement applies to Contractor, its Subcontractors, and any lower-tier Subcontractor providing labor at the site. These reports shall show completed payroll information, and such certificates and statements of compliance as required in the Federal Labor Standards and by the City relative to payrolls. The schedule of wage rates shall be posted on a bulletin board available to the workers.

#### **GC-33.3 Contractor's Daily Reports**

As soon as Contractor has started Work on the Project, it shall compile written daily reports of the Work performed the previous day by its employees, including the employees of Subcontractors.

The reports shall be prepared by Contractor's representative and shall bear his signature. Each report shall contain at least the following information:

- (1) Description of Work items and references to payment items;
- (2) Work forces and construction Equipment employed;
- (3) Materials and Equipment installed;
- (4) Work performed by Subcontractors; and
- (5) Description of any accidents, interruptions, impacts, delays, problems, visitors, impediments, etc. encountered or continued.

Contractor shall require similar reports from Subcontractors for each day on Site and shall attach copies to Contractor's Daily Report when submitted.

### **GC-34 CONTRACTOR'S SUPERVISION OF THE WORK**

#### **GC-34.1 General**

Contractor shall provide competent, efficient supervision of the Work. All Work shall be performed in a skillful, workmanlike and orderly manner, and Contractor and its supervisory personnel shall enforce this requirement at all times.

### GC-34.2 Contractor's Representative

Before beginning Work, Contractor shall notify the City in writing of one (1) person within its organization, satisfactory to the City, who shall have complete authority to supervise Work, to receive orders from the City, and to represent and act for Contractor in all matters arising under Agreement. Contractor shall not remove its representative without first designating, in writing, a new representative, who meets all of the foregoing requirements. Upon ten (10) days notice, the City or the Engineer may request replacement of Contractor's Representative if, in the City's opinion, it is necessary to ensure the timeliness or quality of the Work.

Contractor's representative shall normally be present at or about the Site of Work while the Work is in progress. Before leaving the Site of Work for any extended period, whether or not the Work is in progress, Contractor's representative shall notify the City, in writing, of the designation of an assistant, satisfactory to the City, with full authority to act for the representative in his absence, or shall make substitute arrangements satisfactory to the City. When neither Contractor, its representative, nor the representative's authorized assistant is present on a part of Work, the superintendent, foreman, or other employee or Contractor in charge of that part of the Work shall be an authorized representative of Contractor for the purposes set forth above.

### **GC-35 SUBCONTRACTORS AND SUPPLIERS**

Contractor may utilize the services of specialty Subcontractors on those parts of Work that, under normal contracting practices, are performed by specialty Subcontractors, except as otherwise required by the Agreement Documents.

In addition to the designation of Subcontractors in the proposal documents, Contractor shall submit to the City a listing of the Subcontractor name, full address and telephone number, contact person, class or trade of work, list of similar past projects worked on, including reference names, telephone numbers, and other information as applicable to that Subcontractor and the provisions of the Agreement Documents. Contractor shall make Subcontractor submittals sufficiently in advance of construction requirements to provide the Engineer and City with no less than sixty (60) days for review and appropriate action.

Contractor shall be as fully responsible to the City for the acts and omissions of all Subcontractors and Suppliers, and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it. Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to Work to bind Subcontractors and Suppliers to Contractor by the terms of the General Conditions and other Agreement Documents, insofar as applicable to the work of Subcontractors and Suppliers, and to give Contractor the same power as regards terminating any subcontract that the City may exercise over Contractor under any provisions of the Agreement Documents.

Nothing contained in this Agreement shall create any contractual relation between any Subcontractor or Supplier and the City. The Contractor shall not award more than seventy-five

percent (75%) of the Work to Subcontractors, provided that, to the extent that a more stringent standard is required in the Special Conditions, the more stringent standard shall control.

### **GC-36 INSPECTION OF WORK**

#### **GC-36.1 General**

All of Work shall be subject to inspection by the City for conformity with the Drawings and Specifications, Working Drawings, Shop Drawings, data on Materials and Equipment, and material samples. Inspection of the balance of Work will be in accordance with this article, unless otherwise expressly indicated. Material tests and all other specified tests will be considered part of the inspection process and shall be subject to all of the provisions of this clause.

#### **GC-36.2 Engineer's Access to Work**

The Engineer shall have access to, and may inspect Work at all times and places. He shall have access to, and may inspect, Materials and Equipment to be incorporated in Work at all times at the place of production or manufacture and at the shipping point, as well as at Site of Work.

The Engineer will designate the Materials and Equipment to be inspected at the place of production or manufacture. Contractor shall give the Engineer fourteen (14) days advance written notice of the start of manufacture or production of Materials and Equipment so designated. The Engineer's failure to so designate Materials and Equipment shall in no way limit his right to inspect them at the place of production or manufacture.

Contractor's Materials and Equipment contacts shall include a notice to the Supplier or Subcontractor of the inspection requirements of this clause.

#### **GC-36.3 Cooperation And Safety**

The Engineer will perform inspections in such manner as not to delay Work unnecessarily, and Contractor shall perform the Work in such manner as not to delay inspection unnecessarily. Contractor shall give the Engineer reasonable advance notice of operations requiring special inspection of a portion of Work at any time by reasonable advance notice to the Engineer.

If requested by the Engineer, Contractor shall submit written certification, in a form approved by the Engineer, that he has inspected the Work prior to inspection by the Engineer, and that it complies with the Agreement Documents.

Contractor shall bear any additional inspection costs resulting from Contractor's failure to have a portion of Work ready for inspection at the time requested by Contractor for its inspection, or from reinspection of any previously rejected portion of Work where the defects requiring such rejection were due to Contractor's fault or negligence. Such costs may be deducted, in whole or in part, from any money due or that may become due Contractor under the Agreement.

Contractor shall furnish the Engineer all reasonable facilities for his safety and convenience in inspecting the Work, at all times and at all places where inspection may take place. If the Engineer finds that conditions are unsafe for inspection at a particular location, he may, upon notice to Contractor, refuse to inspect in that location until such conditions are corrected. Contractor shall bear any additional costs incurred to permit subsequent inspection of any portion of Work covered or completed at the location after correction of the conditions, whether or not such portion of Work is found to meet the requirements of the Agreement Documents.

#### GC-36.4 Inspection of Covered or Completed Portions of Work

If so ordered in writing by the Engineer, Contractor shall uncover, remove, tear out, or disassemble, in whole or in part, any covered or completed portion of Work to permit its inspection. If that portion of Work is found to be defective or unauthorized, Contractor shall bear all costs of uncovering, removal, tearing out, or disassembly. If such portion of the Work is found to conform with the Agreement Documents, including Agreement Drawings and Specifications, it shall be recovered, replaced, reassembled, or otherwise restored by Contractor to its original condition and, except as stated below, all Work required in connection with the inspection will be considered extra Work. If such portion of Work was covered or completed without the approval of the Engineer, where such approval was required by the Specifications or required in advance by the Engineer, Contractor shall bear all costs involved in the inspection, notwithstanding conformance of such portion of Work with the Agreement Documents including the Agreement Drawings and Specifications.

#### GC-36.5 Inspection Not a Waiver or Acceptance

Neither the inspection nor lack of inspection of any portion of the Work, nor the presence or absence of the Engineer during performance of any of the Work, nor acceptance of the whole or any part of the Work by the Engineer, nor any possession taken by the City or its employees shall operate as a waiver of any provision of this Agreement Documents or any power herein reserved to City or any rights to damages herein provided. Should an error in the estimate, or conclusive proofs of defective Work or materials used by or on the part of Contractor be discovered after the final payment has been made, the City reserves the right to claim and recover by process of law such sums as may be sufficient to correct the error or to make good the defects in the Work and Materials.

#### GC-36.6 Correction of Non-Compliant Work

If Contractor is found to have Work that fails to meet the intent of the Plans and Specifications or other Agreement Documents, or is in other aspects unsuitable it may be issued a notice of non-compliance on that portion of the Project Work. Contractor shall remedy the defective or incorrect Work within twenty-four (24) hours unless a different schedule is agreed to in writing. This non-compliance status may be issued on temporary installations that fail to protect the Work or site conditions.

### **GC-37 CITY'S AUTHORITY**

The City shall have authority to decide all questions as to interpretation and fulfillment of the requirements and obligations of the Agreement Documents, including, without limitation, all questions as to the prosecution, progress, quality, and acceptability of Work. The City may implement and enforce its decisions by orders, instructions, notices, and other appropriate means.

Any decision, order, instruction, or notice of the City will be confirmed in writing. Such confirmation shall state the specific subject of the decision, order, instruction, or notice and its date, time, place, author and recipient.

Inspectors may be appointed to inspect all Materials used and all Work performed. Such inspection may extend to all or any part of the Work and to the preparation or manufacture of the Materials to be used. Inspectors will not be authorized to approve or accept any portion of the completed Work or to issue instructions contrary to the Plans and Specifications or other Agreement Documents. Inspector will have authority to reject defective Material and to suspend Work that is being improperly performed, subject to the final decision of the City. Inspector shall, in no case, act as foreman or perform other duties for Contractor.

## **GC-38 PROGRESS PAYMENTS**

### **GC-38.1 Progress Estimates**

Within the time set forth in the Special Conditions or, if none, then prior to the submittal of the first Payment Application, Contractor shall submit to the Engineer for approval, in the form directed or acceptable to the Engineer, a complete schedule of values of the various portions of the Work, including quantities and unit prices, aggregating the Agreement Price (except in cases and to the extent that accepted unit prices form the basis of payment). The schedule shall subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction and to coordinate with the progress schedule required under the Special Conditions, and shall be supported by such data to substantiate its correctness as the Engineer may require. Each item in the schedule of values shall include its proper share of overhead and profit. An unbalanced breakdown providing for overpayment to Contractor on items of Work which would be performed first will not be approved. The schedule of values, when approved by the Engineer, shall be used only as a basis for Contractor's monthly request for payment and shall not be used as the basis for computing additions to or deductions from the Agreement Price.

Subject to the provisions of this clause, Contractor shall prepare a written report for the Engineer's approval, on the form approved by the City, of the total amount of value of Work performed under the proposal items of Agreement to the time of such estimate and in accordance with the progress report based on the approved schedule.

No progress estimate or payment shall be considered an approval or acceptance of any Work performed, Material, or Equipment furnished. All estimates and payment will be subject to correction in subsequent estimates and the final estimate.

Progress payments will be made for all completed activities and for suitably stored Materials as herein provided.

#### GC-38.2 Progress Payments

Upon completion of each monthly estimate of Work performed and Materials furnished, the Engineer, subject to the provisions of the Agreement Documents, shall recommend payment to Contractor for the estimated value of such Work, Materials, and Equipment, less the amount of all prior payments and all liquidated damages and other amounts to be deducted or retained under the Agreement. Contractor will be paid one hundred (100%) percent, less retainage, of the cost of Materials received and properly stored but not incorporated into the Work. Payments for Materials or Equipment stored on the Site shall be conditioned upon submission by Contractor of bills of sale or such other procedures satisfactory to the Engineer to establish the City's title to such Materials or Equipment or otherwise protect the City's interest, including applicable insurance. No progress estimate or payment needs to be made when, in the Engineer's judgment, the increment in the estimated value of Work performed and Materials and Equipment furnished since the preceding estimate is less than Ten Thousand Dollars (\$10,000.00). Contractor will be paid on or before the twenty-fifth day following receipt of the approved estimate from the Engineer.

#### GC-38.3 Retention from Progress Payments

The amounts retained by the City from each progress payment shall be as follows:

- (1) Except as noted below, withholding ten percent (10%) of the estimated value of the Work performed until 50 percent of the Contract value, including change orders and other additions to the Contract value provided for by the Contract Documents, is due and the manner of completion of the Contract Work and its progress are reasonably satisfactory to the City.
- (2) At the discretion of the City and with the approval of Contractor, the retainage of each Subcontractor may be released separately as the subcontractor completes his or her work.
- (3) Upon receipt of written request from Contractor, the City may, in its unilateral discretion, reduce retainage to Contractor for payment of retainage to Subcontractors who have completed their Work. If such retainage is released, Contractor shall furnish the City with an affidavit certifying that all monies due the Subcontractor have been paid. If the City determines that the released retainage has not been paid to the Subcontractor, the amount released shall be reinstated.
- (4) The City may, in its unilateral discretion, elect to reduce Contractor's retainage and that of Subcontractors who have not completed all their work if the City believes it to be in its interest to do so.
- (5) If reduced, the City may reinstate ten percent (10%) withholding if it believes it necessary or desirable to do so. Contractor agrees that the City is free to do so.



- (6) If, after discontinuing the retention, the City determines that the Work is unsatisfactory or has fallen behind schedule, retention may be resumed at the previous level. If retention is resumed, Contractor and Subcontractors shall be entitled to resume withholding retainage accordingly.

#### GC-38.4 Additional Payment Conditions

##### GC-38.4.1

The submission and approval of the CPM Schedule and periodic updates thereof, as required by the Schedule requirements of the Special Conditions, shall be an integral part and basic element of the application upon which Progress Payments shall be made. Contractor shall be entitled to Progress Payments only as determined from the currently approved and updated CPM Schedule.

##### GC-38.4.2

Contractor shall promptly pay each Subcontractor upon receipt of payment from the City, out of the amount paid to Contractor on account of such Subcontractor's Work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to Contractor on account of such Subcontractor's Work. Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments to their Subcontractors in similar manner.

##### GC-38.4.3

The City may, on request and at its discretion, furnish to any Subcontractor, if practicable, information regarding the percentages of completion or the amounts applied for by Contractor and the action taken thereon by the City on account of Work done by such Subcontractor.

##### GC-38.4.4

Neither the City nor the Engineer shall have any obligation to pay or to see to the payment of any Subcontractor or Supplier, but may at its sole option, withhold payment from Contractor on account of claims of nonpayment by Subcontractors and Suppliers in accordance with GC-38.5.1.

##### GC-38.4.5

No certification of Progress Payment (any progress payment), or any partial or entire use or occupancy of the Project by the City, shall constitute an acceptance or approval of any Work not fully in accordance with the Agreement Documents.

##### GC-38.4.6

Any and all funds paid to Contractor pursuant to the City-Contractor Agreement are hereby declared to constitute trust funds in the hands of Contractor, to be applied first to the payment of claims of Subcontractors, laborers, and Suppliers arising out of the Work, to claims for utilities furnished and taxes imposed, and to the payment of premiums on surety and other bonds and on insurance, before application to any other purpose. Whenever required by the Engineer, it shall be the duty of Contractor to file with the Engineer a verified statement, in form satisfactory to the Engineer, certifying the amounts then due and owing from Contractor for labor and materials, setting forth therein the names of the person whose charges or claims for labor or materials are unpaid, and the undisputed amount due to each respectively. The City, at its option, may also require the Contractor to furnish evidence of payment of Subcontractors and Suppliers in any form satisfactory to the City in addition to the requirements of GC-38.6.

#### GC-38.4.7

No payments made hereunder by City to Contractor prior to Final Payment shall be deemed conclusive as to the actual value of the Work performed by Contractor or of Contractor's performance of the Agreement.

#### GC-38.4.8

City reserves the right to issue any Progress Payment and Final Payment by check jointly to Contractor and any Subcontractor or Supplier at City's option.

#### GC-38.4.9

Should the City fail to issue any Progress Payment within sixty (60) days of approval of an acceptable monthly estimate of Work performed and Materials furnished, annual interest on the payment amount may accrue at the Prime Rate, plus one percent. The Prime Rate shall be based on that published in the Wall Street Journal on the first business day of January or June, whichever has most recently passed, of the current year. Nothing stated herein shall invalidate any other conditions of Progress Payment approval.

#### GC-38.4.10

Contractor agrees to execute such payment application forms and release of claim forms as the City may require as a condition precedent to the City's obligation to make payment.

#### GC-38.4.11

This Article 38 shall completely supersede the Georgia Prompt Payment Act as it relates to Owner payments and any modifications or successors to it to the full extent allowed by law.

### GC-38.5 Payments Withheld

GC-38.5.1

The City may decline to approve payment and may withhold any payment, in whole or in part, to the extent necessary to reasonably protect the City from loss because of:

- (1) Defective Work not remedied;
- (2) Third party claims filed or reasonable evidence indicating probable filing of such claims;
- (3) Failure of Contractor to make payments properly to Subcontractors, or for labor, Materials or Equipment;
- (4) Reasonable evidence that the Work cannot be completed for the unpaid balance of the Agreement Price;
- (5) Damage or the reasonable expectation of damage to the City or another contractor;
- (6) Reasonable evidence that the Work will not be completed within the Agreement Time;
- (7) Failure to carry out the Work in accordance with the Agreement Documents;
- (8) Failure of Contractor to fully comply with the Schedule requirements of the Special Conditions;
- (9) Failure to comply with insurance and safety requirements;
- (10) Failure to keep current "As-Built" Records; or
- (11) Failure of Contractor to comply with the requirements of the Agreement Documents in connection with the Payment Application process.

GC-38.5.2

When the grounds in Article GC-38.5.1., above are removed, payment shall be made for amounts withheld because of them.

GC-38.6 Waiver and Preservation of Claims In Periodic Application of Payments

Contractor has been employed by the City to furnish labor, Material, services, and other improvements. Upon receipt of the amounts requested in any monthly Application for Payment, Contractor waives and releases any and all claims it may have against the City or the Engineer through the date of that Payment Application, excepting those rights that Contractor may have in any retained amounts on account of labor or Materials, or both, furnished by Contractor and the unresolved claims, if any, enumerated in the Application for Payment. Contractor expressly warrants by submission of its periodic Application for Payment that all due and payable bills with respect to the Work have been paid to date or shall be paid from the proceeds of the Application for Payment, and waivers and releases from all Subcontractors and materialmen have been or will be obtained and delivered to the City in such form as to constitute effective waivers and releases of claims under all applicable laws. Upon receipt of payment of the amounts certified in the Application for Payment, Contractor does thereby waive, release, and relinquish any claims for additional compensation or an extension of time which Contractor has then or may

have had arising out of the performance of the work or the furnishing of the labor or materials by Contractor through the date of the Application for Payment. This waiver and release applies to all facts, events, circumstances, changes, constructive or actual delays, acceleration, extra work, disruption, interferences, impacts and the like, which have occurred or may be claimed to have occurred prior to the date of the Application for Payment, excepting only claims which are then currently unresolved for which written notice has previously been provided to the City **and** which Contractor specifically enumerates in its Application for Payment. Failure to so enumerate claims shall be a final waiver and relinquishment of claim, whether or not such claims were previously submitted in accordance with GC-41.

### **GC-39 SUBSTANTIAL COMPLETION (“Substantial Completion”)**

#### **GC-39.1 Certificate of Substantial Completion**

When Contractor considers that the Work, or a designated portion thereof which is acceptable to the City, is Substantially Complete, Contractor shall prepare for the Engineer a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of Contractor to complete all Work in accordance with the Agreement Documents. When the Engineer, on the basis of an inspection, determines that the Work or designated portion thereof is Substantially Complete, they will then prepare a Certificate of Substantial Completion of the Work which shall establish the Date of Substantial Completion of the Work, shall state the responsibilities of the City and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance and shall fix the time within which Contractor shall complete the items listed therein. The Certificate of Substantial Completion of the Work shall be submitted to the City and Contractor for their written acceptance of the responsibilities assigned to them in such Certificate.

#### **GC-39.2 Warranty Commencement**

Warranties required by the Agreement Documents shall commence on the Date of Final Completion of the Project or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion of the Work or designated portion thereof.

#### **GC-39.3 Intentionally Omitted**

### **GC-40 FINAL PAYMENT (“Final Payment”)**

#### **GC-40.1 Certificate for Final Payment**

Following the Engineer's issuance of the certificate of Substantial Completion of the Work or designated portion thereof, and Contractor's Completion of the Work, Contractor shall forward to the Engineer a Written Notice that the Work is ready for final inspection and acceptance, and shall also forward to the Engineer a final Application for Payment. Upon receipt, the Engineer will make the necessary evaluations. When the Engineer finds the Work acceptable under the

Agreement Documents and the Agreement fully performed, the Engineer will issue a certificate for Payment that will approve the final Payment due Contractor (“Final Payment”).

#### GC-40.2 Final Payment Conditions

Neither the Final Payment nor the retainage shall become due until Contractor submits to the Engineer:

- (1) An affidavit that all payrolls, bills for Materials and Equipment, and other indebtedness connected with the Work have been paid or otherwise satisfied;
- (2) Consent of surety, if any, to Final Payment;
- (3) Clear title for all vehicles and/or trailers, if any, to remain as City property;
- (4) Complete set of as-built record Drawings;
- (5) Documentation for all state sales taxes paid by Contractor including completed State Department of Revenue Refund forms and all necessary back up documentation required by the Department of Revenue;
- (6) If required by the Engineer or City, other data establishing payment or satisfaction of all such obligations, such as receipts, releases, and waivers of liens arising out of the Agreement, to the extent and in such form as may be designated by the Engineer or City. If any Subcontractor refuses to furnish a release or waiver required by the Engineer or City, Contractor may furnish a bond satisfactory to the City to indemnify the City against any such loss. If any lien or indebtedness remains unsatisfied after all payments are made, Contractor shall refund to the City all monies that the latter may be compelled to pay in discharging such lien or other indebtedness, including, without limitation, all costs, expenses, arbitration fees, reasonable attorneys’ fees, expert fees, or consultant fees incurred in connection with same; and
- (7) As a condition of Final Payment on the Project, Contractor shall, prior to final payment, complete and submit to the City, all of the invoice documentation and the State of Georgia Revenue Department forms required to obtain the sales tax refund on all applicable equipment expenditures. This submittal shall include the certified forms and auditable back-up necessary to substantiate the expenditures for State refund.

#### GC-40.3 Intentionally Omitted

#### GC-40.4 Waiver of Claims by Contractor Upon Final Payment

The acceptance of Final Payment shall constitute a waiver of all claims by Contractor except those previously made in writing and identified **and** enumerated by Contractor as unsettled at the time

of the application for Final Payment. Failure to so enumerate unsettled claims shall be a final waiver and relinquishment of claim, whether or not such claims were previously submitted in accordance with GC-41.

## **GC-41 CLAIMS, CHANGES, AND EXTRA WORK**

Contractor acknowledges the extreme importance to Owner of identifying and resolving Claims on an “as-you-go” basis in order for Owner to maintain its relationship with all available funding sources, including local taxpayers as well as the state and federal governments. Contractor further acknowledges the extreme prejudice suffered by Owner as a result of any attempted assertion by Contractor of Claims except as specifically permitted herein in the precise manner and within the time limits established herein, which prejudice includes, but is not limited to that resulting from the trouble and expense of having to deal with disputes over claims, if any, that were not made in accordance with the precise manner and within the time established herein.

### **GC-41.1 Claims and Contractor’s Obligation to Proceed in the Face of Disputes**

#### **GC-41.1.1**

A claim is any demand, contention, or assertion by Contractor seeking additional time or money under the Agreement Documents. Claims by Contractor must be made in writing as specified herein. Claims from Contractor must contain all of the following:

- (1) a narrative statement referencing and attaching the supporting documentation and specifically describing the legal, factual, and contractual basis of the claim;
- (2) if the claim alleges delay to the work or requests an extension time for excusable delay, the claim must include the precise number of days claimed, all alleged impacts on the work, as well as a detailed critical path as-built schedule analysis illustrating that the delays claimed were on the critical path of the Project, and that no concurrent delays were experienced during the critical path delay;
- (3) if the claim alleges improper acceleration of the work pursuant to GC-27.2, the claim must include the precise number of days' time extension Contractor contends it would have been entitled to receive, but for the acceleration, and the precise number of days by which the work has been accelerated. No claims for acceleration for work that is not on the critical path shall be permitted. Claims for acceleration must be accompanied by a detailed CPM analysis. Claims for acceleration shall be limited to the recoverable acceleration expenses referenced in Article GC-27 of this Agreement; and

- (4) if the claim is for additional compensation, the claim must include a detailed calculation of the precise amount claimed with all supporting documentation and shall also comply with Atlanta Procurement Code §2-1201 for claims expected to exceed \$20,000.00. All claims must reference the specific contract provisions relied upon to support the claim. Claims that are not based upon a contractual provision or remedy shall be void as Contractor agrees that its entitlement is limited to the remedies offered by the terms of this Agreement. All claims must specifically reference, by name, this Article, and the fact that the claim is being submitted under this Article. Any writing or other form of notice, however designated, which fails to specifically reference this Article, by name, shall not be deemed to constitute a valid claim hereunder.

Items (1), (2), (3) and (4) above shall hereinafter be referred to as the “Final Accounting.”

Initial written notice of Contractor’s intent to assert a claim (the “Initial Notice”) must be made in writing within seven (7) days after the occurrence of the event giving rise to the claim or the right to submit a claim is waived. Contractor shall submit all information reasonably available to it that is otherwise required in the Final Accounting at the time of the Initial Notice.

Except for Claim events that continue more than thirty (30) days, within thirty (30) days after the conclusion of the event giving rise to the Claim, Contractor shall provide the Final Accounting. Failure to timely provide the Final Accounting shall constitute a waiver of the Claim even if timely Initial Notice is provided. Any waiver by the City of the notice requirements for the Initial Notice or the Final Accounting for a single claim, event, or occurrence shall not constitute a waiver of these notice requirements for any other claim, event, or occurrence. Each request for time or money by Contractor shall be considered a separate claim. All information required in the Final Accounting must be submitted within the time limits established herein, and no supplementation of the information or claims shall be permitted. Any attempted reservation of the right to submit or supplement an earlier made claim shall be void.

For events giving rise to a claim that Contractor contends continues for more than thirty (30) days, including any alleged continuing claims or continuing impacts that Contractor contends continue to accrue beyond thirty (30) days, then Contractor shall give the Initial Notice as required herein, stating therein that the event or impact is continuing. Within thirty (30) days of the start of the event (as documented by the Initial Notice), Contractor shall provide all information available to it that is required in the Final Accounting, including without limitation a quantification of any costs incurred to date. Contractor shall supplement the required information, including without limitation any additional damages accrued during the period and any scheduling information required, every thirty (30) days thereafter until the event or impact ceases, culminating in the Final Accounting

within thirty (30) days thereafter. Failure to timely provide: (a) the Initial Notice; (b) the information due within thirty (30) days thereafter; (c) timely and complete supplements; or (d) the timely Final Accounting shall be deemed a waiver of any claim for time or money for events occurring after the date Contractor last timely and completely complied with the requirements hereof. Any attempt to reserve the right to supplement at a different time or to accrue costs or impacts beyond thirty (30) days shall be void and shall be deemed a waiver of any further claim relating thereto.

The Final Accounting shall be accompanied by a sworn statement from a representative of Contractor who is the person most knowledgeable of the facts and circumstances surrounding the Claim and personally familiar with such facts and circumstances certifying that (a) the claim is submitted in good faith, (b) the cost data and all backup information submitted are true, accurate, and complete, and (c) that the amount requested accurately reflects the amount for which Contractor and the Affiant believe the City is liable.

#### GC-41.1.2 Claim Review

Upon receiving a statement of claim, and with the advice and assistance of the Engineer as appropriate, the City may review the statement of claim submitted by Contractor. In conducting this review, the Engineer or other person designated by the City shall have the right to require Contractor to submit such additional or supporting documents, data and other information as the City and/or the Engineer may require, and the failure to submit such additional documents, data or other information within thirty (30) days following written request shall be deemed a waiver of the claim. Contractor agrees that it will produce any documents requested that would otherwise be produceable in a civil action under O.C.G.A. § 9-11-34. Upon completion of such review, to take place within such time as the City may designate following receipt of the additional documents, data or other information as may have been required by the City and/or the Engineer, the City in consultation with the Engineer may issue a written determination, and if it deems appropriate accept such parts of the claim as are found in good faith to be proper. If Contractor agrees, a Change Order shall be issued to amend the Agreement Price, the time for completion or either of them as may be found proper. If Contractor disputes the determination made by the City, Contractor as a condition precedent to any further action to resolve such dispute must notify the City and the Engineer in writing within ten (10) days following receipt of the decision of the factual basis of such dispute and permit the City fifteen (15) additional days to reconsider and, if it deems it appropriate, issue a modified decision.

#### GC-41.1.3 No Waiver

Nothing contained in this section shall operate to limit or extinguish any right or defense of the City contained elsewhere in the Agreement Documents or available at law or in equity or constitute a waiver by the City of any right or defense otherwise available. Nothing in this Article GC-41 shall alter Article GC-24 or GC-26 or give Contractor the



right to recover additional compensation not authorized by other items of the Contract Documents or precluded thereby.

#### GC-41.1.4 Absolute Conditions Precedent

The failure of Contractor to file any claim within the time limits prescribed herein or in the form or manner precisely as required hereby shall be deemed a material prejudice to the interests of the City and shall constitute an absolute waiver of the claim and the right to file or thereafter prosecute the same.

#### GC-41.1.5

Claims by the Owner shall not be subject to the requirements of Section 41.1, Claims by the Owner shall be asserted within a reasonable time of discovery of the claim and shall include information necessary for Contractor to reasonably evaluate the claim. The Owner agrees to notify Contractor in writing of its claims within a reasonable time but not later than the close of discovery in any arbitration or litigation conducted hereunder.

#### GC-41.1.6

Pending final resolution of a Claim, except as otherwise agreed in writing, Contractor shall proceed diligently with performance of the Work and the Owner shall continue to make undisputed payments in accordance with the Agreement Documents. The making of any payment by Owner shall not constitute a waiver of any Claims by the Owner or an acknowledgement by Owner that Contractor is entitled to additional time or money.

#### GC-41.1.7

Contractor acknowledges the extreme importance to the City of completing the Work as expeditiously as possible and the prejudice the City may suffer if the Work is not completed as scheduled. Contractor further acknowledges the strong likelihood that disputes between the parties will arise and that Contractor will likely be required to perform disputed work which the City contends to be included within Contractor's scope of work, or that if acknowledged as changed or extra work, the likelihood that the City may dispute the amount of Contractor's alleged entitlement. Irrespective of whether it is within the general scope of the Work, Contractor agrees to perform all work, whether disputed or undisputed, that the City directs. No dispute or controversy shall interfere with the progress of construction, and Contractor shall proceed with the work without interruption, deficiency, or delay. Contractor warrants and represents that Contractor and its Surety have sufficient capitalization and resources to complete the Work, including all disputed work whether or not it is within the general scope of the work, and resolve disputes in accordance with the terms of this Agreement. Contractor therefore agrees that any failure or refusal by Contractor to perform disputed work which the City directs Contractor to perform shall be a material and substantial breach of the Agreement for which Contractor and its surety are jointly and severally liable. Contractor acknowledges and agrees that its failure or refusal to perform disputed work will cause the City significant damage and that such damages

may include increased costs to have another contractor complete the work at a premium over the costs Contractor would have incurred to perform the disputed work. Contractor acknowledges and agrees that should it refuse to proceed in the face of disputes, it is liable for all additional costs incurred in completing both Contractor's base Agreement scope of work and any changed, extra, or additional work.

## GC-41.2 Changes in the Work

### GC-41.2.1 General

#### GC-41.2.1.1

Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Agreement, by Change Order, Field Change, Work Authorization or Change Directive. For purposes of this Agreement, the terms "extra work" or "additional work" shall have the same meaning as "changed work" and be governed by the same Agreement provisions governing changes.

#### GC-41.2.1.2

Changes in the Work shall be performed under applicable provisions of the Agreement Documents, and Contractor shall proceed promptly, unless otherwise provided in the Change Order, Field Change, Work Authorization or Change Directive. A change in the Agreement Price or the Agreement Time shall be accomplished only by Change Order or Change Directive, and no other compensation shall be due to Contractor other than that permitted pursuant to a Change Order or a Change Directive. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim that Owner has been unjustly enriched by any change to the Work, whether or not there is, in fact, any unjust enrichment, shall be the basis of any claim for an increase in any amounts due under the Agreement Documents or a change in any time period provided for the Agreement Documents. Any failure to comply with the notice and other claim procedure requirements included herein or any other Agreement requirements shall be a waiver of the right to additional time or money.

#### GC-41.2.1.3

Any written directive which Contractor believes to constitute a Change hereunder must be accompanied by the notice required under Article GC-41 governing claims. ALL CONTRACTOR CLAIMS FOR CHANGES MUST BE ASSERTED IN ACCORDANCE WITH ARTICLE GC-41 OR THEY ARE WAIVED AND RELEASED.

### GC-41.2.2 Change Orders

GC-41.2.2.1 [Intentionally Omitted]GC-41.2.2.2 [Intentionally Deleted]GC-41.2.2.3

Methods used in determining adjustments to the Agreement Price for Change Orders shall be limited to those listed, below:

Any Change Order accepted by Owner and Contractor constitutes a full and final settlement and accord and satisfaction of all effects of the change, including but not limited to any and all impact, delay and/or disruption relating thereto upon any and all aspects of the Work or the Agreement Documents, and will compensate Contractor fully. In such case, Contractor expressly waives any and all right to make a Claim or to take any action or proceeding for any other consequences of any Change Order, whether the consequences result directly or indirectly from the Change Order. In addition, Contractor expressly waives and releases any Claim it may have against the Owner for any adjustment in the Substantial Completion Date or Final Completion Date resulting from, arising out of, or related to the change reflected in any such Change Order, including, but not limited to, any impact that such change may have on the unchanged portion of the Work or the Substantial or Final Completion Date. In addition, Contractor expressly waives and releases any Claim it may have against the Owner for any additional compensation or damages resulting from, arising out of, or related to, the change reflected in any such Change Order, including, but not limited to any Claim for damages due to delay, disruption, hindrance, impact, ripple effect, cumulative impact, interference, cardinal change, abandonment, inefficiencies or extra work arising out of, resulting from, or related to the change reflected in any such Change Order, including, but not limited to, any impact that such change may have on the unchanged portion of the Work or the Substantial or Final Completion Date.

GC-41.2.3 Change DirectivesGC-41.2.3.1

The Owner may, by Change Directive, without invalidating the Contract, order Changes in the Work consisting of additions, deletions or other revisions, the Agreement Price and Agreement Time being adjusted accordingly to the extent necessary. Any Claim arising from a Change Directive must be made in accordance with the terms of this Contract.

GC-41.2.3.2

A Change Directive shall be used in the absence of total agreement on the terms of a Change Order, Field Change, or Work Authorization.

#### GC-41.2.3.3

If the Change Directive warrants an adjustment to the Agreement Price, the adjustment shall be based on one of the following methods:

- (1) mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- (2) unit prices stated in the Agreement Documents or subsequently agreed upon;
- (3) cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- (4) by Force Account as provided hereafter.

#### GC-41.2.4 Force Account

When no agreement is reached for Changed Work to be done at Lump Sum or Unit Prices or another mutually agreed manner, such work may be authorized by the City to be done on a Force Account basis. A Force Account estimate that identifies all anticipated costs shall be prepared by Contractor. Work shall not begin until the Force Account is approved. Payment for Force Account work will be in accordance with the following:

##### GC-41.2.4.1 Labor

For all labor, equipment operators, and supervisors, excluding superintendents, in direct charge of the specific operations, Contractor shall receive the rate of wage agreed upon in writing before beginning work for each and every hour that said labor, equipment operators, and supervisors are actually engaged in such work.

Contractor shall receive the actual costs paid to, or in behalf of, workers by reason of subsistence and travel allowances, health and welfare benefits, pension fund benefits, or other benefits, when such amounts are required by collective bargaining agreement or other employment contract generally applicable to the classes of labor employed on The Work.

An amount equal to 10% of the sum of the above items will also be paid Contractor. Said 10% shall be deemed to include 3% for Contractor's fee and 7% for Contractor's overhead.

##### GC-41.2.4.2 Bond, Insurance, and Tax

For bond premiums, property damage, liability, and worker's compensation insurance premiums, unemployment insurance contributions, and Social Security taxes on the Force Account work, Contractor shall receive the actual cost, to which cost no percentage will be added. Contractor shall furnish satisfactory evidence of the rate or rates paid for such bond, insurance, and tax.

#### GC-41.2.4.3 Materials

For materials accepted by the Engineer and used, Contractor shall receive the actual cost of such material incorporated into The Work, including Contractor paid transportation charges (exclusive of machinery rentals as hereinafter set forth), to which cost 10% will be added. Said 10% shall be deemed to include 3% for Contractor's fee and 7% for Contractor's overhead.

#### GC-41.2.4.4 Equipment

For any machinery or special equipment (other than small tools) including fuel and lubricant, plus transportation costs, the use of which has been authorized by the Engineer, Contractor shall receive the rental rates indicated below for the actual time that such equipment is in operation on the Work or the time, as indicated below, the equipment is directed to stand by.

Equipment rates shall be based on the edition in effect at the time of Contractor's original bid of the *Rental Rate Blue Book for Construction Equipment* or *Rental Rate Blue Book for Older Construction Equipment*, whichever applies, as published by EquipmentWatch using all instructions and adjustments contained therein and as modified below.

Allowable Equipment Rates shall be established as defined below:

- Allowable Hourly Equipment Rate = Monthly Rate/176 x Adjustment factors x 70%.
- Allowable Hourly Operating Cost = Hourly Operating Cost x 70%.
- Allowable Rate Per Hour = Allowable Hourly Equipment Rate + allowable Hourly Operating Cost.
- Standby Rate = Allowable Hourly Equipment Rate x 35%

NOTE: The monthly rate is the basic machine plus any attachments.

Standby rates shall apply when equipment is not in operation and is directed by the Engineer to standby for later use. In general, Standby rates shall apply when equipment is not in use, but will be needed again to complete The Work and the cost of moving the equipment will exceed the accumulated standby cost. Payment for standby time will not be made on any day the equipment operates for 8 or more hours. For equipment accumulating less than 8 hours operating

time on any normal workday, standby payment will be limited to only that number of hours which, when added to the operating time for that day equals 8 hours. Standby payment will not be made on days that are not normally considered workdays.

The City will not approve any rates in excess of the rates as outlined above.

Payable time periods will not include:

- Time elapsed while equipment is broken down;
- Time spent in repairing equipment; or
- Time elapsed after the Engineer has advised Contractor the equipment is no longer needed.

If a piece of equipment is needed which is not included in the above *Blue Book* rental rates, reasonable rates shall be agreed upon in writing before the equipment is used. All equipment charges by persons or firms other than Contractor shall be supported by invoices.

Transportation charges for each piece of equipment to and from the site of the Work will be paid provided:

- The equipment is obtained from the nearest approved source;
- The return charges do not exceed the delivery charges;
- Haul rates do not exceed the established rates of licensed haulers; and
- Such charges are restricted to those units of equipment not already available and not on or near the Project.

No additional compensation will be made for equipment repair.

#### GC-41.2.4.5 Miscellaneous

No additional allowance will be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.

#### GC-41.2.4.6 Compensation

Contractor's representative and the Engineer shall compare records and agree on the cost of work done as ordered on a Force Account basis at the end of each day. Should Contractor fail or refuse to fulfill this daily record keeping function by meeting with the Engineer and agreeing upon the cost of Force Account Work, Contractor agrees that it forfeits and releases any right to payment or right to claim for the Force Account Work for that day.

#### GC-41.2.4.7 Subcontract Force Account Work

For work performed by an approved Subcontractor or lower-tier Subcontractor, all provisions of this Section that apply to Contractor in respect to labor, materials and equipment shall govern. Contractor shall coordinate the work of its Subcontractor. The prime Contractor will be allowed an amount to cover administrative cost equal to 5% of the Subcontractor's amount earned but not to exceed \$5,000.00 per Subcontractor for each Change in Work performed by Force Account. Markup for lower-tier Subcontract work will not be allowed. The 5% shall be for Contractor's overhead in administering the change.

Should it become necessary for Contractor or Subcontractor to hire a firm to perform a specialized type of work or service which Contractor or Subcontractor is not qualified to perform, payment will be made at reasonable invoice cost. To each invoice cost a markup to cover administrative cost equal to 5% of the total invoice but not to exceed \$5,000.00 will be allowed Contractor or Subcontractor but not both. If paid to Contractor, the 5% shall be for Contractor's overhead in administering the change.

#### GC-41.2.4.8 Statements

No payment will be made for work performed on a Force Account basis until Contractor has furnished the Engineer with duplicate itemized statements of the cost of such Force Account work detailed as follows:

- (1) Name, classification, date, daily hours, total hours, rate, and extension for each laborer, equipment operator, and supervisor, excluding superintendents;
- (2) Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment;
- (3) Quantities of materials, prices, and extensions;
- (4) Transportation of materials; and
- (5) Cost of property damage, liability, and worker's compensation insurance premiums, unemployment insurance contributions, and Social Security tax.

Statements shall be accompanied and supported by invoices for all materials used and transportation charges. However, if materials used on the Force Account work are not purchased specifically for such work but are taken from Contractor's stock, then, in lieu of the invoices, Contractor shall furnish an affidavit certifying that such materials were taken from its stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to Contractor.

Payment based on Force Account records shall constitute full payment and settlement of all additional costs and expenses caused by, arising from, or associated with the Work performed, including any time related or impact costs in connection with the Force Account work or any unchanged work impacted thereby.

#### GC-41.2.5

If any change or Change Directive meets the requirements for excusable delay and a change in the Agreement Time is warranted as a direct result of the change or Change Directive, then the four items of delay damage compensation identified in Article GC-26.2.1 for the unenforceability exception to the recoverability of delay damages under the Agreement may be included as a part of the adjustment in the Agreement Price for the change or change directive if Contractor has met all other requirements of the Agreement, including the notice and claim procedure requirements. Provided, however, Contractor shall, under no circumstances, be allowed to duplicate any costs included under this Article so as to receive a double recovery. In the event that Contractor is entitled to the four items of delay damage compensation referenced above, there shall be deducted from said entitlement all amounts paid or allowed Contractor for overhead pursuant to the percentage markups included herein.

#### GC-41.2.6

Upon receipt of a Change Directive, Contractor shall promptly proceed with the Change in the Work involved and advise the Owner of Contractor's agreement or disagreement with the method, if any, provided in the Change Directive for determining the proposed adjustment in the Agreement Price or Agreement Time utilizing the notice and claim procedures set forth herein.

#### GC-41.2.7

A Change Directive signed by Contractor indicates the agreement of Contractor therewith, including adjustment in Agreement Price and Agreement Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order, Field Change or Work Authorization, as applicable.

#### GC-41.2.8

If Contractor does not respond promptly or disagrees with the method for adjustment in the Agreement Price, the method and the adjustment shall be based upon the actual expenditures and savings attributable to the change, as determined in accordance with Article 41.2.4.

#### GC-41.2.9



The amount of credit to be allowed by Contractor to the Owner for a deletion or change which results in a net decrease in the Agreement Price shall be the actual cost, and that proportion of Contractor's Fee (including both profit and overhead) allocable to such actual cost.

#### GC-41.2.10

Pending final determination of the total cost of a Change Directive to the Owner, amounts not in dispute for such changes in the Work may be included in Applications for Payment accompanied by a Change Order, Field Change or Work Authorization (as applicable) indicating the parties' agreement with part or all of such costs. For any portion of such cost that remains in dispute, the Owner may make an interim determination for purposes of monthly certification for payment for those costs. That interim determination of cost, if made, shall be subject to the right of the Owner to change or withdraw the same unless and until finalized by Change Order, Field Change or Work Authorization, as applicable.

#### GC-41.2.11

When Contractor agrees with the determination made by the Owner concerning the adjustments in the Agreement Price and Agreement Time, if any, or Owner and Contractor otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and shall be recorded by preparation and execution of an appropriate Change Order, Field Change or Work Authorization, as applicable.

### GC-41.3 No Oral Changes

It is expressly agreed that, except in an emergency endangering life or property, no modifications, additions or changes to the Work shall be made except upon written order of Contractor, and Contractor shall not be liable to Subcontractor for any extra labor, materials or equipment furnished without such written order. No officer, employee or agent of Contractor is authorized to direct any extra or Changed work by verbal order nor is Subcontractor authorized to proceed with any work upon verbal order.

No eliminations, additions, or alterations shall be made in the Work except upon written order of The City. No course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim that the City has been unjustly enriched by any alteration or addition to the Work, whether or not there is, in fact, any unjust enrichment to the Work, shall be the basis of any claim for an increase in any amounts due under the Agreement Documents or an increase in any time period provided for in the Agreement Documents. No action, conduct, omission, prior failure, or course of dealing by the City shall waive, modify, change, or alter the requirement that Change Orders, Field Changes, Work Authorizations and Change Directives must be in writing signed by the City and/or Contractor, and that written Change Orders are the exclusive methods for effecting any change to the Agreement Price or Agreement Time. Contractor understands and agrees that the Agreement Price and Agreement Time cannot be changed by implication, oral contracts, verbal directives, actions, inactions, course of conduct, or constructive

change order. Contractor shall be under no obligation to perform pursuant to an oral directive to perform work in addition to the Project scope excepting the case of an emergency threatening personal injury or property damage. Contractor acknowledges and agrees that no one in the City's organization has the authority to order changes without a signed writing.

#### **GC-42 WORK AUTHORIZATIONS**

When directed by the City's Representative through a Work Authorization, the Contractor will perform Work that is expressly or generally contemplated under any allowance or contingency items designated by the Agreement Documents, which may include a Change for the addition of Work that does not result in an increase in the overall Agreement Price. Work Authorizations may include Work items that are not necessarily shown in the Agreement Documents, but may be necessary for the successful completion of the Project. The performance of the Work Authorization items must conform to the standards of the Agreement Documents. The funding for Work Authorizations is an allowance only and not a compensable pay item. The City is solely responsible for the appropriation of the funds. The Contractor shall have no claims to such funds. The City will retain ownership of any such funds not used after the completion of Work. The Work shall be assigned and directed by the City's Representative in written form. Measurement, Payment, Invoicing and Pricing of Adjustments for Work Authorizations will be in accordance with the Agreement Documents.

#### **GC-43 OWNERSHIP AND USE OF DOCUMENTS**

All Contract Documents furnished to the Contractor remain the property of the City. The Contract Documents are to be used only with respect to this Project and are not to be used on any other project. All Contract Documents are to be returned to the City upon request at the completion of the Work. The Contractor may maintain a record set of the Contract Documents for its records, but will maintain the confidentiality of the record set, except as required by law. The Contractor can use the Contract Documents for any purposes required for the Project that will not be considered publication in derogation of the common law copyright or other reserved rights of the holder.

Neither Contractor nor any Subcontractor, Sub-Subcontractor, Supplier, vendor or other person or organization performing or furnishing any of the Work under a direct or indirect contract with City acquires any title to or ownership rights in any of the Contract Documents. The Contractor may not reuse the Contract Documents for extensions of the Project or for any other project without written consent of the City.

#### **GC-44 CHANGED CONDITIONS**

Contractor shall notify the Engineer in writing of the following conditions, hereinafter called "changed conditions," promptly upon their discovery and before they are disturbed, in any event no later than seven (7) calendar days after their discovery:

- (1) Subsurface or latent physical conditions at the site of Work differing materially from those indicated in this Agreement; or
- (2) Unknown physical conditions at the site of the Work of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Agreement.

The Engineer shall promptly investigate the conditions, and if he finds that such conditions do materially so differ and cause an increase or decrease in Contractor's cost of, or the time required for, performance of any part of the Work under this Agreement, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the Agreement modified in writing in accordance with the provisions of this Agreement, subject to the provisions regarding Change Orders, Change Directives, notice and claims procedure and excusable delays. If the Engineer determines that conditions of which he has been notified by Contractor do not justify an adjustment in compensation, he will so advise Contractor in writing. Should Contractor disagree with such determination, it may submit a notice of claim to the Engineer as provided herein and follow the claims procedures of Article GC-41.

In computing any equitable adjustment sought by Contractor, the actual costs incurred by Contractor, computed in accordance with the Force Account provisions for changes shall be the standard for determining Contractor's entitlement. Provided, however, that if the City shows that conditions encountered by Contractor on the Project were more favorable and less costly than what Contractor reasonably should have expected to encounter, the net effect on Contractor from both the favorable and unfavorable conditions shall be considered in determining the amount of any equitable adjustment.

#### **GC-45 INTENTIONALLY OMITTED**

#### **GC-46 INTENTIONALLY OMITTED**

#### **GC-47 INTENTIONALLY OMITTED**

#### **GC-48 INTENTIONALLY OMITTED**

#### **GC-49 MEASUREMENT AND PAYMENT**

##### **GC-49.1 Measurement**

All items of Work to be paid for at Agreement Prices per unit of measurement will be measured or certified by the Engineer.

**GC-49.2 Payment at Agreement Prices**

The Agreement prices for items of Work shall include full compensation for all costs of items, including the costs for any Work, Materials and Equipment incidental to the items but not specifically shown or described in the Drawings and Specifications, subject only to such express limitations as may be stated in the Specifications defining the items or prescribing payment thereof.

**GC-50 HISTORICAL, SCIENTIFIC, AND ARCHEOLOGICAL DISCOVERIES**

All articles of historical or scientific value, including, but not limited to, coins, fossils, articles of antiquity, which may be uncovered by Contractor during process of Work, shall become the property of City. Such findings shall be reported immediately to the Engineer who will determine the further operations of Contractor, the method of removal, where necessary, and the final disposition thereof.

**GC-51 SEPARATE AGREEMENTS****GC-51.1 Separate Contractors**

The City reserves the right to award other Agreements in connection with this Project. Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate its Work with theirs. If the proper execution of any part of Contractor's Work depends upon the work of another contractor, Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results.

**GC-51.2 Cooperation**

The City may perform additional work related to the Project by itself, or it may let other contracts containing provisions similar to these. Contractor shall afford the other contractors who are parties to such contracts and/or the City, if it is performing the additional work itself, reasonable opportunity for the introduction and storage of materials and equipment and the execution of work and shall properly connect and coordinate its work with theirs.

**GC-51.3 Review of Separate Contractor's Work**

If any part of Contractor's Work depends for proper execution or results upon the work of the City or any separate contractor, Contractor shall, prior to proceeding with the Work, promptly report to the Engineer any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of Contractor so to report shall constitute an acceptance of the City's or separate contractor's work as fit and proper to receive the work, except as to defects which may subsequently become apparent in such work by others.

GC-51.4 Notice to Contractor

If the performance of additional work by other contractors of the City is not noted in the Agreement Documents prior to the execution of the Agreement, Written Notice thereof shall be given to Contractor prior to starting any such additional work.

GC-51.5 Damage to Separate Contractor

Should Contractor wrongfully delay, impact, or cause damage to the work or property of any separate contractor, Contractor shall, upon due notice, promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor sues or initiates a proceeding against the City or the Engineer on account of any delay or damage alleged to have been caused by Contractor, the City shall notify Contractor, who shall defend such proceedings at Contractor's expense, and if any judgment or award against the City or the Engineer arises therefrom, Contractor shall pay or satisfy it and shall reimburse the City for all costs and expenses, including without limitation, attorneys' fees, expert fees, consultant fees, court costs, and litigation or arbitration fees or expenses that the City has incurred.

GC-51.6 City's Right to Clean Up

If a dispute arises between Contractor and separate contractors as to their responsibility for cleaning up or for accomplishing coordination, the City may clean up and carry out such work and charge the cost thereof to Contractors responsible therefor as the Engineer shall determine to be just.

**GC-52 OFFICIAL NOT TO BENEFIT**

No officer or employee of the City shall be permitted to participate in the performance of this Agreement or receive any benefit or compensation arising out of the performance of such Agreement, and any Agreement entered into by the City in which any officer or employee of the City shall be personally interested shall be void, and no payment shall be made thereon by the City or any officer thereof; but this provision shall not be construed to extend to the Agreement if made with a corporation for its general benefit.

A bribe or attempt to bribe any representative or officer of City by Contractor shall be considered as a breach of the Agreement in bad faith, and shall thus empower City to complete Work and deduct the entire cost thereof from any monies due or to become due Contractor under the Agreement.

**GC-53 GRATUITIES AND KICKBACKS**

The Contractor's Contract may be terminated in accordance with the Clause titled "TERMINATION FOR DEFAULT" if, after notice and hearing, the City determines that the

Contractor, its agent, or another representative offered or gave a gratuity or kick-back to an officer, official, or employee of the City and intended, by the gratuity, to obtain a contract or favorable treatment under a contract.

The rights and remedies of the City provided in this Clause are not exclusive and are in addition to any other rights and remedies provided by law or under this Contract.

The Contractor warrants that: (1) it has not employed nor retained any company or person, other than a bona fide employee working for the Contractor, to solicit or secure the contract; and that the Contractor has not paid or agreed to pay any person, company, association, corporation, individual or firm, other than a bona fide employee working for the Contractor, any fee, commission, percentage, gift or any other consideration contingent upon or resulting from the award or making of the contract. After Notice and hearing and upon a finding in contradictions to this Paragraph constituting a breach or violation of the above warranty, the City has the right to terminate the contract or take other appropriate actions.

#### **GC-54 PRECONSTRUCTION CONFERENCE**

Within twenty (20) days after delivery of the executed agreement by City to Contractor, but before issuance of Notice to Proceed, a conference will be held to review progress schedules, to review the insurance and safety program, to establish procedures for handling Shop Drawings and other submittals and for processing progress payments, and to establish a Working understanding between the parties as to the Project.

Contractor shall submit to the City for approval, prior to the preconstruction conference, a preliminary schedule of Shop Drawing submittals, and certification of insurance as required by Appendix B.

#### **GC-55 TIME OF COMPLETION AND LIQUIDATED DAMAGES**

##### **GC-55.1 Liquidated Damages**

It is understood and agreed that the City will sustain substantial monetary and other injury and damages, including, but not limited to, increased costs, expenses and liabilities in the event of failure by Contractor to perform its Work in accordance with the Completion and any Interim Milestone Date(s) set forth in the CPM Schedule prepared in accordance with the Special Conditions. Accordingly, should Contractor not complete the Work, or any such portion thereof, within the date(s) required by the CPM Schedule initially approved by the Engineer, as they may be adjusted pursuant to the Agreement Documents, then charges shall be assessed against any money due or that may become due Contractor in accordance with the following schedule:

For Each day of delay in Substantial Completion of the entire Work:           \$2500/ day

For Each day of delay in Final Completion of the entire Work:           \$1500/ day

The amount of such charges is hereby agreed upon as fixed liquidated damages due the City after the expiration of the Agreement Date(s) for completion specified in the CPM Schedule for the Work or portions thereof. Contractor and its surety shall be liable for any liquidated damages in excess of the amount due Contractor on the Final Payment.

If the CPM Schedule projects an untimely completion with unexcused delay and the City in good faith believes that retainage will be insufficient to cover the City's damages, Contractor agrees that the City may withhold additional funds to assure the payment of the liquidated damages owed by Contractor.

#### GC-55.2 No Penalty

The fixed liquidated damages are not established as a penalty but are calculated and agreed upon in advance by the City and Contractor due to the uncertainty and impossibility of making a determination as to the actual direct, incidental and consequential damages which are incurred by the City as a result of the failure on the part of Contractor to complete the Work within the Agreement Time and completion date(s) specified in the Agreement Documents. Liquidated damages shall start in accordance with the above schedule upon notification to Contractor in writing that all apparent Agreement Time allowed to achieve the relevant completion date has been consumed. Liquidated Damages as they accrue will be deducted from periodic partial payments to the extent they are sufficient to cover the liquidated damages owing; provided that any excess liquidated damages owing over the periodic partial payment amount may be deducted from retainage. Such deduction shall be in addition to the retainage provided for in the Agreement Documents. The remaining amount of liquidated damages owing upon completion will be deducted from any amounts owing as Final Payment to Contractor or its surety. Any excess amount owing as liquidated damages shall be paid upon demand.

### **GC-56 RIGHT TO AUDIT**

Contractor shall keep and maintain accurate books and records, and supporting data, documentation, correspondence, reports, instructions, Drawings, receipts, vouchers, and memoranda regarding performance of Work hereunder and including specifically, but without limitation, such information as estimates (pre and post Bid), costs incurred, labor and Materials consumed, schedules and progress records and quality control. Such books and records shall be available for inspection, audit, and copying by the City or its authorized representative for any purpose during the Work and for a period of three (3) years after Final Payment.

### **GC-57 DISPUTES**

#### GC-57.1 Mediation

In the event of any controversy, claim, dispute or other matter in question arising out of or relating to this Agreement of the breach thereof or otherwise in connection with the Project to which this Agreement pertains, at the City's sole and exclusive option the parties shall, if the City so elects

and as an express condition precedent to any party to this Agreement commencing legal action against the other relating to or arising out of the dispute, mediate the dispute utilizing a mutually agreeable mediator. Prior to commencing any legal action against the City, Contractor must either mediate the dispute, at the City's election, or obtain a written waiver from the City of its right to mediate.

#### GC-57.2 Arbitration at the City's Election

At the Owner's sole election, any Claim arising out of or related to the Agreement shall be subject either to binding arbitration or litigation at the City's option. Prior to arbitration or litigation, the parties shall endeavor to resolve Claims or disputes in accordance with the terms of this Contract.

##### GC-57.2.1

If Claims are not resolved by negotiation, mediation, or otherwise, and the Owner elects arbitration, the arbitration shall be held in Atlanta, Georgia and shall be in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently then in effect or such other similar rules and organization as the Owner may elect. The demand for arbitration shall be in writing and filed with the appropriate organization selected by the Owner and shall be served on the other party to the Contract. The agreement to arbitrate shall be specifically enforceable under applicable law in any court having jurisdiction thereof. In any arbitration or litigation, the arbitrators or the Court shall have the jurisdiction to award the City costs, arbitrator fees, expert fees, and attorneys' fees, and the arbitrators or the Court shall award all such fees to the City if it is the prevailing party.

##### GC-57.2.2

Except at Owner's sole discretion and with its consent, no arbitration arising out of or relating to the Agreement shall include, by consolidation or joinder or in any other manner, any other person or entity, including but not limited to the Designer and its employees and consultants, any of Contractor's subcontractors and suppliers, and any other separate contractors or suppliers. The Owner's consent or election to allow consolidation or joinder or shall not constitute consent to arbitration of any claim not subject to arbitration pursuant to this Contract.

##### GC-57.2.3

Any award rendered by an arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

#### GC-57.3 Litigation If Arbitration Not Elected

If the Owner does not elect arbitration, any Claims shall be resolved in Fulton County, Georgia Superior Court. Contractor hereby submits to jurisdiction and venue in Fulton County, Georgia, and waives all defenses based on a lack of jurisdiction and/or venue. Contractor acknowledges that this Agreement was negotiated, at least in part, in Fulton County, Georgia. In any arbitration



or litigation, the arbitrators or the Court shall have the jurisdiction to award the City costs, arbitrator fees, expert fees, and attorneys' fees, and the arbitrators or the Court shall award all such fees to the City if it is the prevailing party.

## **GC-58 AGREEMENT ADMINISTRATION DOCUMENTS**

A substantial number of documents will be required for the administration of the Agreement. Some of these documents are identified in this document and elsewhere in the Agreement Documents (such as the Payment and Performance Bond forms) and others may not be. The Engineer shall have full power and authority to designate and prepare the documents to be used and Contractor and all Subcontractors and Material Suppliers shall utilize the documents so prepared and provided to them by the Engineer and shall follow the instructions of the Engineer with respect thereto in all regards save and excepting only those documents, if any, which Contractor reasonably determines contain terms or requirements contrary to or in addition to and not reasonably inferable from the terms of the Agreement Documents. If Contractor believes that any form or other document provided by the Engineer under the authority of this Section is subject to rejection by Contractor under the terms hereof, it shall notify the Engineer thereof within ten (10) days following its first receipt of the particular document or form giving specific reasons why the document or form is entitled to rejection. Thereafter, the form or document will be withdrawn, amended, or utilized as the Engineer finds in good faith to be appropriate after reviewing the notice provided by Contractor. All agreement administration documents may be revised at any time by the Engineer.

## **GC-59 MISCELLANEOUS PROVISIONS**

### **GC-59.1 Governing Law**

The Agreement shall be governed by the law of the State of Georgia.

### **GC-59.2 Contingent Assignment**

Effective as of any termination of the Agreement, Contractor hereby assigns to City all of Contractor's interest in those subcontracts and purchase orders entered into by Contractor prior to termination if the City specifically requests such an assignment by Written Notice. All Subcontractors and Purchase Orders shall provide that they are freely assignable by Contractor to the City and its assigns. City shall be at liberty to negotiate with and engage (for itself) any Subcontractors, Suppliers, or others that Contractor dealt with prior to termination.

### **GC-59.3 Rights and Remedies**

#### **GC-59.3.1**

The duties and obligations imposed by the Agreement Documents and the rights and remedies available thereunder shall be in addition to, and not a limitation of, any duties, obligations, rights and remedies otherwise imposed or available by law.

GC-59.3.2

No action or failure to act or to require in any one or more instances upon the strict performance of any one or more of the provisions of the Agreement Documents, or to exercise any right herein contained or provided by law by the City or the Engineer, shall constitute a waiver of any right or duty afforded any of them under the Agreement Documents, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach hereunder, nor shall it be construed as a waiver of the right to subsequently demand strict performance or exercise such rights, and the rights shall continue unchanged and remain in full force and effect, except as may be specifically agreed in writing.

GC-59.3.3

Contractor agrees that it can be adequately compensated by money damages for any breach of this Agreement which may be committed by the City and hereby agrees that no default, act, or omission of the City, or the Engineer, shall constitute a material breach of the Agreement entitling Contractor to cancel or rescind the provisions of this Agreement or (unless the City shall so consent or direct in writing) to suspend or abandon performance of all or any part of the Work. Contractor hereby waives any and all rights and remedies to which it may otherwise be or become entitled, save only its right to money damages.

GC-59.4 Unenforceability of any Article

If any Article or term of the Agreement Documents is held as a matter of law to be unenforceable or unconscionable, the remainder of the Agreement shall be enforceable without such clause or term, and only the narrowest possible portion of the clause or term that is allowed by law shall be unenforceable.

GC-59.5 Obligation to Perform

Contractor shall carry on the Work and adhere to the approved current CPM Schedule during and notwithstanding all disputes or disagreements with City. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as Contractor and City may otherwise agree in writing.

GC-59.6 Labor Relations

Work on the Project may be performed by both union and nonunion separate contractors, Subcontractors, Suppliers, and other entities and persons. In the event of any strike, picket, sympathy strike, work stoppage, or other form of labor dispute at the Project whether directed at Contractor, other separate contractors, Subcontractors, Suppliers or other persons, Contractor shall continue to perform its Work required hereby without interruption or delay. In the event Contractor fails to continue its Work without interruption or delay, because of any or such events, the City, in addition to all other rights it has in the Agreement Documents and at law, may terminate

the Agreement after giving Contractor forty-eight (48) hours written notice of its intent to do so for reason of Contractor's failure to perform. Additionally, if Contractor is party to one or more labor agreement, Contractor shall take all reasonable action to avoid any Work stoppage, and in the event of a work stoppage, Contractor shall within twenty-four (24) hours take all legal action permitted by such labor agreements or by law in order to expedite resumption of Work on this Project.

#### GC-59.7 Covenant Not to Sue

Should the City elect to terminate the employment of Contractor for default as provided herein, then Contractor covenants that it will not file any suit or proceeding of any kind against the City by reason thereof until the City shall have either abandoned the Project or completed the Work as defined under the Agreement Documents. If Contractor should breach this "Covenant Not To Sue," then Contractor shall be liable to the City for all costs resulting to the City therefrom, including, without limitation, all attorneys' fees expended by the City in defending said suit or proceeding, unless a positive determination is made therein that Contractor's termination by the City was motivated by fraud and bad faith and was without justification of any kind.

#### GC-59.8 Publicity and Advertising

The Contractor will not make any announcement, take any photographs, or release any information concerning the Work, this Contract, or the Project to any member of the public, press, business entity, or any official body, unless prior written consent is obtained from the City's Representative. The Contractor may not erect any signs without the written approval of the City's Representative.

### **GC-60 STATEMENT OF NON-DISCRIMINATION**

During the performance of this Agreement, Contractor agrees to comply with all provisions of Part 2, Chapter 2, Article X, Division 11, including Section 2-1414 of the Code of Ordinances, City of Atlanta, as may be hereafter amended.

### **GC-61 EQUAL BUSINESS OPPORTUNITY (EBO)**

During the performance of this Agreement, Contractor agrees to comply with all provisions of Part 2, Chapter 2, Article X, Division 11, including Section 2-1441 through 2-1460 of the Code of Ordinances of the City of Atlanta, the Equal Business Opportunity ("EBO") Program as may be hereafter amended.

### **GC-62 WAGE RATES AND REPORTING PROCEDURES**

#### GC-62.1 Certified Payrolls

Contractor shall maintain accurate payroll records and be prepared to submit certified copies for the prime contractor and all subcontractors. Payrolls reporting an employee for the first time must contain the complete name, address, and social security of the employee.

GC-62.2 Submittals

All required payrolls shall be submitted to the Office of Contract Compliance. Any questions concerning these submittals can be addressed:

Office of Contract Compliance  
55 Trinity Avenue, Suite 1700  
Atlanta, Georgia 30303  
(404) 330-6010

GC-62.3 [Intentionally Omitted]

# Exhibit B

## Special Conditions

## SC-1 PRECONSTRUCTION VIDEO SURVEY AND INSPECTIONS

Contractor is expressly advised that the protection of buildings, structures, equipment, electrical systems, instrumentation and related work adjacent and in the vicinity of its operations, wherever they may be, is solely its responsibility. Conditional inspection of buildings, structures, equipment, electrical systems and instrumentation shall be performed by and be the responsibility of the Contractor.

Repairs or replacement of all conditions disturbed by the construction shall be made to the satisfaction of the Engineer. This does not preclude conforming to the requirements of the insurance underwriters. Two (2) copies of surveys, photographs, videos, reports, etc., shall be given to the Engineer.

The Contractor shall retain an independent Consultant, specializing in preconstruction surveys, to conduct the required inspections. The preconstruction survey will be performed by a firm specializing in performing such surveys. The qualifications and experience of the proposed consultant shall be submitted to the Engineer for approval prior to assignment of the Services.

Perform a preconstruction video survey and inspection in advance of construction to document the existing condition of buildings, facilities, structures, utilities, roads, driveways and related work.

The video surveys and inspections shall clearly document the existing conditions and be completed before any operations have begun and subject areas disturbed by any construction activities. The video surveys and inspection notes, reports, etc. shall be submitted to the Engineer. The video surveys and inspections shall make an examination of the interior and exterior of buildings, structures, facilities and utilities, and record by notes, measurements, photographs, videos, etc., conditions which might be aggravated by construction activities. Prior to any type of blasting, video surveys and inspections of residences and other private structures existing within the survey and inspection corridor shall have been completed.

The cost of all pre-construction video surveys and inspections shall be borne by the Contractor.

## SC-2 RIGHT OF WAY AND CONSTRUCTION ACCESS

The City will furnish all rights of way for the performance of Services included in this Agreement. Areas designated on the Agreement Drawings as the Contractor's Work Area will be provided to the Contractor for the duration of construction, without charge. The Contractor will be responsible for observing the limits of the right-of-way and shall prohibit any Services being done on or any damage to property outside the bounds of the right-of-way. Additional work and storage space, if required, shall be obtained by the Contractor at no additional costs to the City.

### SC-3 SAFETY AND HEALTH

The Contractor shall comply with all applicable health and safety standards and provisions required by the City of Atlanta, Fulton County, State of Georgia, and the Federal Government and its regulatory agencies. The Contractor shall maintain an accurate record of all cases of death, occupational diseases, and injury requiring medical attention or causing loss of time from work arising out of and in the course of employment on work under the Contract. This project involves work in and around operating combined and sanitary sewer systems. In these areas as well as in shafts and tunnels, the potential exists for toxic and/or explosive gases. The Contractor shall exercise caution when entering any confined space. The atmosphere shall be tested for oxygen levels, presence of chemicals, and explosivity before entry. Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any damage, which may result from their failure or their improper construction, maintenance, or operation.

- A. Emergency phone numbers (fire, medical, police) shall be posted at the Contractor's phone and its location known to all.
- B. Accidents shall be reported immediately to the Engineer by messenger or phone.
- C. All accidents shall be documented and a fully detailed written report submitted to the Engineer after each accident.

### SC-4 LAYOUT OF THE WORK AND SURVEYING

#### SC-4.1 General

- A. The Services required include providing field engineering services, which includes establishing and maintaining survey control points and baselines as necessary to control the alignment (vertical and horizontal) and all parts of the Services within the specified tolerances, and documentation of the results.
- B. The Contractor shall be responsible for the development and implementation of a surveying program capable of satisfying all Project survey and accuracy requirements. This program shall be subject to the review of the Engineer before commencement of the work. The review shall in no way release the Contractor of liabilities associated with or dependent on this part of the Services.
- C. Control datum for the survey has been established by the Engineer and is indicated on the Drawings.

#### SC-4.2 Quality Control

- A. Planning and execution of the field engineering services shall be supervised by engineers or land surveyors registered in the State of Georgia and shall be conducted by personnel with documented experience in the specific types of work required.
- B. The allowable combined errors of land surveys shall be compatible with excavation, and pipe placement tolerances.

SC-4.3 Submittals Related to Contractor's Field Engineering Services

- A. Submit qualifications of land surveyor supervisor(s) with detailed references made to projects requiring application of similar surveying procedures and techniques including name, address, and telephone number to the Engineer for review prior to commencement of any survey work.
- B. Submit detailed description of proposed survey method, network diagrams and equipment type, accompanied with manufacturer's literature specifying probable accessories, calibration procedures, requirements and frequencies.
- C. Submit shop drawings showing survey monument materials and methods of installation, preservation and recovery.
- D. Submit mathematical pre-analysis to demonstrate that the required accuracies can be achieved using the proposed methods.
- E. Submit, upon request, a complete and accurate log of control and survey work including documentation verifying accuracy of survey work as it progresses, and upon completion of the Work. Documentation shall include, but not be limited to, survey field books, sketches, drawings and layouts.

SC-4.4 General Requirements Related to Contractor's Field Engineering Services

- A. The Engineer has established basic survey control points as shown on the Drawings. The Contractor shall examine and verify locations of survey control points, and shall notify the Engineer of any discrepancies discovered, within forty-eight (48) hours of discovery and before starting the Services.
- B. Establish, verify and maintain a minimum of **three (3)** additional survey monuments for the work.. The monuments shall be permanent on site and referenced to the established survey control points. Record locations, with horizontal and vertical data, on Project Record Documents. Monuments will also be checked and verified by the construction verification surveyor. Survey notes relating to the monuments and primary control points shall be submitted to the Engineer.
- C. At all times, protect, preserve and maintain survey control points used for the Services. Report to the Engineer the loss, destruction or relocation of any survey control point and replace survey control points based on original survey control. Make no changes without prior written notice to the Engineer.
- D. Use equipment and implementation techniques such as forced centering techniques at survey control points as necessary to achieve required accuracies.



- E. Furnish information to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in, or affected by, construction. Through the Engineer, coordinate with local authorities having jurisdiction.
- F. Establish elevations, lines and levels. Locate and layout by instrumentation and similar appropriate means:
  - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes and invert elevations.
  - 2. Grid or axis for structures.
  - 3. Foundation and wall locations, sloping floor elevations, and embedment centerlines and elevations.
- G. Where the dimensions and locations of existing structures are of critical importance in the installation or connection of any part of the work, verify such dimensions and locations in the field before the fabrication of any material or embedment, which is dependent on the correctness of such information.

#### SC-4.5 Calibration and Data Processing

- A. Calibrate all procedures and instruments as required and as recommended by the instrument manufacturer. Maintain a log showing date and type of calibration performed indicating the name of the individual performing the calibration.
- B. Data reduction shall incorporate calibrations and meteorological corrections, and rigorous reduction of measurements to the ellipsoid and thence to the coordinate system. Correct distance measurements by electro-optical distance measurement instrument for scale, cyclic error, zero error, and meteorological effects. Correct azimuths using the Laplace correction and include the effect of the deflection of the vertical components on angles and azimuth measurements.
- C. Data processing shall include, as required, rigorous least squares adjustments. Employ data outlier detection. Determine horizontal and vertical confidence intervals.

#### SC-5 DISPOSAL OF WASTE MATERIAL

The disposal of all excavated material or spoil not required for use in the permanent work shall be the responsibility of the Contractor. He shall remove all excess excavated material or spoil from the site of the Work and dispose of the same in a legal manner at no additional cost to the City. Burning of debris on site will not be allowed.

#### SC-6 REMOVAL OF CONDEMNED MATERIAL

Material on the site, which has been determined by the Engineer to be unsuitable or not in conformity with the Contract documents shall be removed from the vicinity of the work without delay and disposed of in an approved area.

If the Contractor fails to do so within forty-eight (48) hours after the receipt of notice, the condemned materials may be removed by the City and the cost of said removal shall be borne by the Contractor.

#### SC-7 DETECTION OF MOVEMENT

In order to detect any movement of buildings or structures that may be affected by his work, Contractor shall, prior to excavation, establish a system of vertical and horizontal control points on or about such buildings or structures, tied to bench marks and indices sufficiently remote to not be moved by his operations. A plan of this system shall be submitted to the Engineer for review. Reading shall be taken of these points and permanently recorded prior to the start of excavation. The City will not assume any responsibility for alleged damages to any building or structure arising from the Services performed under this Agreement.

#### SC-8 EXISTING UTILITIES

##### SC-8.1 Verification of the Location of the Existing Utilities

Representations of existing utilities, facilities, and structures in the Contract Documents are based upon the best available information. The City and the Engineer will not be responsible for the completeness or accuracy thereof nor for any deductions, interpretations, or conclusions drawn therefrom. The Contractor shall verify to his own satisfaction by test pit or other means, the actual location of existing utilities prior to construction in their vicinity.

- A. Should the Contractor in the course of his operations encounter any underground utilities the presence of which was not previously known, or a different type than shown, he shall immediately notify the Engineer and take all necessary precautions to protect the utility and maintain continuance of service until said utilities can be adjusted by the appropriate owners.
- B. Contractor will notify all public utility corporations, jurisdictional agencies, or other owners to make all necessary adjustments to public utility fixtures and appurtenances within or adjacent to the limits of construction. Delays and additional cost resulting from a failure of the Contractor to notify the utility or to provide adequate notice to the utility shall be at no additional cost to the City, when such facilities are indicated in the Agreement Documents, and in such case, no extension of time will be granted for delays caused by utility adjustments.
- C. Damage caused to utilities either directly or indirectly by the Contractor shall be repaired and the facilities restored to their original condition to the satisfaction of the Engineer and the utility owner, at no additional cost to the City.

### SC-8.2 Work in Vicinity of Existing Utilities

At least three (3) working days prior to starting work in the vicinity of utility structures and appurtenances, Contractor shall notify Engineer and appropriate utility companies and jurisdictional agencies. Contractor shall support and protect all utility structures and appurtenances in accordance with the requirements of the Agreement Documents and the utility companies, and shall take any other steps necessary to protect the structures from disturbance or damage.

A substitute City of Atlanta Ordinance adopted March 13, 1978 requires Contractors to contact each gas company maintaining underground gas pipes or facilities within the city limits prior to the start of excavation work by blasting or mechanized excavating equipment.

### SC-8.3 Access to Utilities Facilities

The Contractor shall at all times permit free and clear access to the various affected facilities by personnel of the utility owners or operators who are working within the limits of work for the purpose of inspection, maintenance, or providing additional service requirements, and the construction of new facilities. When personnel of the utility owners or operators are working within the limits of work to be performed by Contractor, the Contractor will not be relieved of his responsibility for the maintenance and protection of such facilities.

### SC-9 WORK IN FLOOD PLAIN AREAS

The Contractor shall comply with all regulations of Section 16-26006 of the Zoning Ordinance of the City of Atlanta concerning work in Flood Hazard Districts, and Fulton County Zoning Resolutions regarding Flood Protection.

### SC-10 MAINTENANCE OF TRAFFIC

Contractor shall provide, erect, maintain, and finally remove all barricades, danger warning and detour signs necessary to properly protect and divert traffic. All barricades and signs, including detour signs, shall be illuminated at night or when visibility is reduced. The Contractor will be held responsible for all damage to the Services due to failure of the signs and barricades to properly protect the Services from traffic, pedestrians, animals, and from all other sources, and whenever evidence of any such traffic is found upon the Services the Engineer will order that the Work, if in his opinion it is damaged, be immediately removed and replaced by the Contractor at no additional cost to the City. The devices used will be in accordance with the manual of Uniform Traffic Control Devices for Streets and Highways compiled by the State Department of Transportation. Access to City streets and roads will be limited and will require the use of flagmen or the installation of traffic control signals, or both. The City must approve haul routes.

A City of Atlanta Substitute Ordinance adopted March 13, 1978 requires that Contractors obtain a permit for work involving blockage of a public street. Open pits, trenches, unpaved streets, debris, or other obstructions due to construction that will prevent the normal flow of traffic during an extended construction stoppage for any reason, will not be permitted. In the event an

extended construction stoppage is found to be necessary, Contractor shall, at his own expense, provide normal traffic flow during extended construction stoppage. Extended stoppage will be defined by the City.

## SC-11 ENVIRONMENTAL PROTECTION

### SC-11.1 General

Contractor shall conduct his operation in a manner to prevent pollution of the environment surrounding the area of work by every means possible and shall be responsible for furnishing all necessary items for fulfilling the work described herein.

### SC-11.2 Material Transport

Contractor shall comply with Section 11-2021 of the Code of Ordinances of the City of Atlanta pertaining to the duties of the Contractor in hauling material over City owned rights-of-way. This includes but is not limited to, approval of proposed haul routes, prevention of dropping of materials or debris on the streets from trucks arriving and leaving the site, providing a suitable vehicle inspection and cleaning installation with permanent crew, and the removal of any material spilled in public areas at no additional cost to the local government agency.

### SC-11.3 Waste Materials

No waste or erosion materials shall be allowed to enter natural or manmade water or sewage removal systems. Erosion materials from excavations, borrow areas, or stockpiled fill shall be contained within the work area. Contractor shall develop methods for control of waste and erosion, which shall include such means as filtration, settlement, and manual removal to satisfy the above requirements.

### SC-11.4 Burning

No burning of waste shall be allowed.

### SC-11.5: Dust Control

The Contractor shall at all times control the generation of dust by his operations. Control of dust shall be accomplished by water sprinkling or by other methods approved by the Engineer.

### SC-11.6 Noise Control

The Contractor shall take every action possible to minimize the noise caused by his operation.

When required by agencies having jurisdiction, noise-producing work shall be performed in less sensitive hours of the day or week as directed by the Engineer.

The Contractor shall provide equipment that operates with the least possible noise. The use of noisy equipment is prohibited. Hoists and compressor plants shall be electrically operated unless otherwise permitted. The air intake of compressors shall be equipped with silencers, and machinery operated by gearing shall be provided with a type of gearing designed to reduce noise to a minimum. Internal combustion engines shall be equipped with mufflers in good order.

Noise generated by mobile construction equipment, stationary construction equipment, and other equipment involved in the construction of the work shall not exceed the decibel levels indicated below. Noise generated by mobile and stationary construction equipment will be measured three to 6 feet from building lines, and on the A weighing network of Type-2 general purpose sound level meter set at fast response.

	Combined Residential and Commercial
Allowable Sound Levels of Mobile Construction Equipment:	
- From 7 a.m. to 10 p.m., Monday thru Saturday, Except Legal Holidays	85 dBA
- At times other than those listed above	70 dBA
Allowable Sound Levels of Stationary Construction Equipment:	
- From 7 a.m. to 10 p.m., Monday thru Saturday, Except Legal Holidays	70 dBA
- At times other than those noted above	60 dBA

Contractor shall assure compliance by measuring noise levels as may be required.

#### SC-11.7 Use of Chemicals

All Chemicals used during construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, must show approval of either EPA or FDA. Use of all such chemicals and disposal of residues shall be in conformance with instructions.

#### SC-11.8 By-Passing During Construction

No wastewater shall be by-passed at sewage collection or treatment facilities during project construction unless a by-passing schedule has been approved by City and the Georgia Environmental Protection Division. It shall be the responsibility of the Contractor to prepare and secure the approval of any by-passing not specifically identified in the Agreement Documents.

#### SC-11.9 Responsibility for Spills and Accidental Discharges

In the event that the Contractor causes or has a spill or accidental discharge for which the City is fined by the State of Georgia EPD, the Contractor agrees to remediate the spill or discharge immediately in accordance with current EPD regulations and to pay any fines assessed against

the City and/or Contractor, and pay for the City's cost associated with efforts to remediate the situation.

#### SC-12 RIGHT TO OPERATE

As soon as any portion of structures and equipment are ready for use, the City shall have the right to operate such portion upon written notice to the Contractor by the City. The City shall also issue a certificate of completion for that portion of the work. Guarantee period on that portion of Service will begin upon issuance of certificate of completion for that portion.

Testing of equipment and appurtenance and training of City's personnel as specified hereinunder shall not constitute operation.

The execution of the bonds shall constitute the consent of the surety.

The Contractor shall provide an endorsement to his insurance permitting occupancy of the structures and use of equipment during the remaining period of construction.

#### SC-13 LIST OF MATERIALS, FIXTURES AND EQUIPMENT

- A. Within thirty (30) days after issuance of the Notice to Proceed, before any materials, fixtures or equipment are purchased, and prior to start of construction, the Contractor shall submit for approval by the Engineer the names and addresses of the manufacturers, and their catalog numbers and trade names for all materials, equipment and fixtures listed under the following Sections of the Agreement Documents:

Divisions 2, 3, 5, 7, 8, 9, 11, 12, 13, 15 and 16

The Contractor shall furnish other detailed information when so directed, under the various items. No consideration will be given to partial lists submitted from time to time except that approval of long delivery items of equipment may be requested individually. Items which are not in accordance with the Specification requirements may be rejected. The Contractor shall furnish a statement giving a complete description of all points wherein the equipment he proposes to furnish does not comply with the Specifications as well as any exceptions he may take to the Specifications. Failure to furnish such statements will be interpreted to mean that the equipment meets all requirements of the Specifications.

- B. In the event the Contractor wishes to resubmit items of materials, fixtures and equipment for review subsequent to obtaining approval as indicated in "A" above, then the Contractor shall pay the cost of the Engineering review of each such resubmittal including shop drawing review if this review has been performed.

#### SC-14 CITY OF ATLANTA PROJECT SIGN

The basic design of the Project sign shall conform *to Attachment 1 herein* including the names of all current Council Members, the Mayor and the Commissioner, Department of Watershed Management. The City seal portion of the sign must be shaded, such that it is visible from fifty (50) yards. A full color shop drawing submittal is required before fabrication. The Project sign will be no less than 4'-0" x 8'-0" and the City requires a Project sign at the designated entrance to the Project.

In addition to the Project sign, there is to be adequate temporary signage for identifying the Project areas, offices, delivery areas and any other designations the Engineer and/or the Contractor feel are needed. These signs will designate which Phase of the Agreement that they pertain to as part of the Project coordination.

#### SC-15 PROJECT MEETINGS

The Engineer shall schedule weekly progress meetings. The progress meetings will be held at least weekly and may be scheduled at a more frequent interval by the Engineer if necessary. Progress meetings shall be held at a location designated by the Engineer.

Progress meetings shall be attended by the Engineer, Contractor, Subcontractors as appropriate to the agenda, suppliers as appropriate to the agenda and others as required.

The meeting agenda shall generally include review and approval of minutes of previous meeting, review of work progress since previous meeting, field observations, problems, and conflicts, problems which impede Construction Schedule, review of off-site fabrication and delivery schedules, corrective measures and procedures to regain project schedule, revisions to Construction Schedule, progress and schedule of the preceding work period, coordination of schedules, review of submittal schedules and status, status of requests for information, maintenance of quality standards, pending changes and substitutions, and other business.

#### SC-16 CONSTRUCTION SCHEDULE

Timely performance is of the essence on this Project. The Contractor may complete the Project or any part of the Project earlier than is stipulated in the Contract and the Milestone requirements. The Contractor may schedule his work to complete earlier than required by the Contract or stipulated in the approved schedule, however, under no circumstances shall the Contractor be entitled to added compensation for delays, which occur during the originally stipulated contract period.

The City has purchased the entire scheduled time period by virtue of this Contract and further stipulates that only those delays which meet the tests set forth in GC-26 will be considered for adjustment and only to the extent that they delay the work past the originally contractually stipulated milestones.

SC-16.1 Procedures

- A. The Work under this Contract shall be planned, scheduled, executed, reported and accomplished using the Precedence Diagramming Critical Path Method (hereinafter referred to as CPM). The work required by this section includes the requirement to prepare, maintain, and update all detailed schedules as described in this section. The CPM Schedules shall be prepared in such a manner as to permit the orderly planning, organization, and execution of the Work and be sufficiently detailed to accurately depict all the Work required by the Contract. Contractor shall resource (labor, material and equipment) and cost load its Schedule as specified herein.
  - B. Contractor hereby agrees that in the process of preparing its baseline schedule and monthly updates, it will consult with all key Subcontractors and suppliers to assure concurrence with the feasibility and achievability of Contractor's planned start dates, sequencing, durations, and completion dates. A copy of the computer input files, XER format shall be submitted on CD-R with each submittal. The procedures, technical details and Contractor's participation and responsibilities shall be as hereinafter described.
  - C. Contractor is responsible for determining the sequence of activities, the time estimates for the detailed construction activities and the means, methods, techniques and procedures to be employed. The Schedules identified herein shall represent the Contractor's best judgment of how it will prosecute the Work in compliance with the Contract requirements. Contractor shall ensure that the Schedule is current and accurate and is properly and timely monitored, updated and revised as Project conditions may require and as required by the Contract Documents.
  - D. Contractor shall use Primavera Project Management software (P6) or latest version, and a hardware system commensurate with the size of the project. The system shall be capable of handling, processing, printing, and plotting all data required to satisfy the requirements of this section. All electronic files submitted to Owner or Engineer shall be compatible with Primavera Project Management (P6) or latest version. Any and all costs incurred by the Contractor in researching, training and/or educating its personnel in CPM Scheduling and/or Primavera P6 (or the utilization of outside consultants) shall be part of the Contractor's bid price and not reimbursed separately by the City
- 1. The Project Network Schedule Diagram, mathematical analysis, written narrative and monthly updates will be reviewed by either the Engineer or an independent consultant selected by the Engineer. Items will be reviewed for compliance with these Specifications and accurate reporting by the Contractor of work in place, resource loading and work activity durations.



2. Submit to the Engineer for acceptance a final CPM Baseline Construction Schedule, a Final Schedule of Values including Allowance Items, allocated to the CPM Schedule activities, and written narrative to further explain the plan as set forth in its CPM logic network and schedule within 45 days of the Notice to Proceed. Requirements for the final CPM Baseline Construction and Final Schedule of Values are further described hereinafter. Contractor's Application for Payment will not be approved until the final CPM Baseline Schedule and Schedule of Values have been accepted. The Contract Baseline Schedule submittal shall not show any progress until it is accepted by Engineer

#### SC-16.2 Standards

- A. Definition: CPM, as required by this Section, shall comply with the standards outlined in the Associated General Contractors' publication, "Construction Planning and Scheduling" unless specifically changed by this Section.
- B. CPM Construction Schedule: The Contractor's CPM Construction Schedule shall include a graphic time scaled logic network, computerized tabular reports and resource loading as described below. To be acceptable, the schedule must demonstrate the following:
  1. A logical succession of Work from start to finish. This logical succession, when accepted, is the Contractor's work plan and, contrary to normal CPM standards, is designated as early start/early finish solely to accommodate the Primavera software.
  2. Clear definition of each activity including cost, manpower, equipment and material quantities as resources. The assigned dollar value (cost loading) of each activity shall cumulatively equal the contract price.
  3. Proper interfacing of related activities including submittals, major material and equipment deliveries, procurement, required permits and other constraints such as equipment or manpower/crew availability. Submittal dates must include review periods and permit schedules must include agency review and issue dates. The narrative shall explain the rationale for all constraints, lags and unusual relationships.
  4. Agreement with the interim milestones, schedule coordination requirements, and completion dates indicated in the Contract Documents.
- C. CPM Graphic Logic Network
  1. The CPM graphic logic network or diagram shall be in the form of a time-scaled diagram of the customary precedence diagram and may be divided into a number of separate pages with suitable notation relating the interface points among the pages. Individual pages shall not exceed 34-inch by 44-inch. Notation on each activity line shall include activity descriptions, total float, and durations as a minimum.

2. All construction activities and procurement shall be indicated in a time-scaled format, and a calendar shall be shown on all sheets along the entire sheet length. Each activity shall be plotted so the beginning and completion dates of said activity can be determined graphically by comparison with the calendar scale. A legend shall be included clearly distinguishing between critical and non-critical path activities and progress to date.
- D. Duration: The duration indicated for each activity shall be in units of whole working days and shall represent the single best time considering the scope of the Work and resources planned for the activity including time for holidays and inclement weather. The calendar for the network shall be in calendar days. Except for certain non-labor activities, such as submittal preparation and review, curing concrete, delivering and fabrication of materials, or other activities described specifically in the Contract, activity durations shall not exceed 14 Days, be less than one Day, nor exceed \$50,000 in value unless otherwise accepted by the Engineer.
- E. For all equipment and materials to be fabricated or supplied for the Project, the Contract Baseline Schedule shall show a sequence of activities including: (a) preparation of shop drawings and sample submissions; (b) thirty (30) calendar days for review of shop drawings and samples (c) shop fabrication, delivery and storage, (d) erection or installation; and, (e) testing of equipment and materials
- F. The Interim Schedule and Contract Baseline Schedule shall show dependencies (or relationships) between each activity. Each activity must have a successor and predecessor, except for the Project Start and Finish Milestone. The use of date constraints shall be limited to Contract Milestones and Contract Completion dates only, unless approved by the Engineer.
- G. Contract Baseline Schedule shall contain or be able to demonstrate an orderly progression of work from Notice to Proceed to Final Completion and that the following items have been addressed: (a) the Project's name; (b) the Contractor's name; (c) revision or edition number; (d) activities of required work to complete, (e) activities relating to different areas of responsibility, such as subcontracted Work which is distinctly separated from that being done by the Contractor directly; (f) labor resources distinguished by craft or crew requirements; (g) equipment and material resources distinguished by equipment and material requirements; (h) distinct and identifiable subdivisions of work such as structural slabs, beams, columns; (i) locations of work within the contract limit lines that necessitates different times or crews to perform; (j) outage schedules for existing utility services that will be interrupted during the performance of the Work; (k) acquisition and installation of equipment and materials supplied and/or installed by the Owner or its separate contractors; (l) material to be stored on site; (m) Phases; and (n) Interim Milestones and the Contract Completion dates.
- H. Lag relationships, or durations between activities, shall be limited to 10 calendar days and used only upon acceptance by the Engineer.

- I. Computerized Tabular Reports: Reports shall include the following for each activity depicted in the schedule.
  - 1. Activity ID
  - 2. Activity Description
  - 3. Duration (original and remaining)
  - 4. Early Start Date
  - 5. Early Finish Date
  - 6. Total Float
  - 7. Percent Complete
  - 8. Activity Cost and Resources
  - 9. Actual Start Date
  - 10. Actual Finish Date
  
- J. Project Information: Each report shall be prefaced with the following summary data.
  - 1. Project Name
  - 2. Contractor
  - 3. Type of Tabulation (Initial or Updated)
  - 4. Project Duration
  - 5. Project Scheduled Completion Date
  - 6. Projected Completion Date
  
- K. The Contract Baseline Schedule shall include coding (both activity and project coding) to allow additional grouping and sorting means. The Engineer shall provide the coding dictionary. Coding shall include (but shall not be limited to) the following:
  - 1. Area
  - 2. Department
  - 3. Phase
  - 4. CSI Code
  - 5. Responsibility
  - 6. Crew/ Craft

#### SC-16.3 Acceptance

- A. The finalized CPM Baseline Construction Schedule will be acceptable to the Engineer when it provides an orderly progression of the Work from Notice to Proceed to Final Completion in accordance with the Contract requirements, adequately defines the Contractor's Work plan, provides a workable arrangement for processing submittals in accordance with the requirements, and properly allocates resource values for manpower, major materials, equipment and costs to each activity (free of unbalances in resources) as determined by the Engineer. Manpower may be represented as composite crews in the CPM Construction Schedule. The network diagram and tabular reports when accepted by the Engineer shall constitute the CPM Construction Schedule until revised and re-accepted.

- B. When the CPM Baseline Construction Schedule has been accepted, the Contractor shall submit to the Engineer:
1. six (6) copies of the CPM graphic logic network,
  2. six (6) copies of a computerized, tabular report in which activities have been sequenced by early starting date,
  3. two (2) copies of the schedule on CD
  4. six (6) copies of the narrative..
- C. The Engineer's review and acceptance of the Contractor's CPM Baseline Construction Schedule is for conformance to the requirements of the Contract Documents only. Review and acceptance by the Engineer of the Contractor's CPM Construction Schedule does not relieve the Contractor of any of its responsibility whatsoever for the accuracy or feasibility of the CPM Construction Schedule, or of the Contractor's ability to meet interim milestone dates and the Contract completion date, nor does such review and acceptance expressly or impliedly warrant, acknowledge, or admit the reasonableness of the logic, durations, and resource value loading of the Contractor's CPM Construction Schedule.
- D. The Contractor shall participate in a conference with the Engineer to review the Engineer's comments on the schedule and evaluation of the proposed network diagram, mathematical analysis and monetary value of activities. This meeting is to take place within five (5) calendar days upon return of reviewed submittal. The intent is to reach a clearer understanding of the CPM and reach consensus on any revisions to be made. Any revisions necessary as a result of this review shall be resubmitted to the Engineer within ten (10) calendar days after the conference. The accepted schedule shall then be used by the Contractor for planning, organizing and directing the work and for reporting progress. If the Contractor desires to make changes in his method of performing the Work, he shall notify the Engineer in writing stating the reason for the changes and receive written acceptance of the change prior to putting the change into the accepted schedule.

#### SC-16.4 Qualifications

- A. The Contractor shall demonstrate competence in the use of CPM scheduling through the submission of a fully compliant CPM Construction Schedule with the initial CPM submission. In the event the Contractor fails to so demonstrate competence in the CPM scheduling, the Engineer may direct the Contractor to employ the services of a Scheduling Firm that can demonstrate competence. The Contractor shall comply with such directive.
- B. The Contractor shall use the services of scheduler who has verifiable training and credentials in preparing and maintaining a computerized CPM Construction Schedule using Primavera (P6) or latest software as specified herein. The scheduler must qualify within the planning period.

1. Required Experience: Performed CPM scheduling on at least 2 completed construction projects of value at least 75 percent as large as this one and having at least 75 percent as many schedule items as this one. Scheduling of both projects shall have been done using Primavera software (P6 for Windows) or equal.
2. Submit the following:
  - a. Descriptions of at least 2 projects of the value and complexity above.
  - b. Copy of a CPM schedule from one of the previous projects.
  - c. Names and telephone numbers of facility owner representative, design engineer, and construction manager for each project.
  - d. Evidence supporting the above qualifications shall be submitted to the Engineer.

#### SC-16.5 Submittal Requirements

- A. Initial submittal, revisions and monthly updates of the network diagram, mathematical analysis, and written narrative shall be submitted in six hard copies and two data copies on CD. Submittals will not be accepted unless they are complete as described herein.
- B. The Contractor shall submit monthly the following:
  1. A CPM timescaled logic network, computer generated schedule using Primavera Project Management (P6) software (The latest version of P6 for Windows).
  2. Computerized Tabular Reports.
    - a. Activity sort by early start, organized by facility or area.
    - b. Predecessor/successor listing.
    - c. Activity code dictionary.
    - d. Resource code dictionary.
  3. Written narrative report describing the logic and reasoning of the schedule. Refer to section SC-16.16 for a complete list of narrative report requirements.
  4. Resource value allocation by activity.
  5. Breakdown of specific cost amount for each component of multi-component activities in the CPM Schedule in spreadsheet format (using Microsoft Excel) showing component unit quantities as well as costs. Such breakdown, when accepted by the Engineer shall constitute the Schedule of Values for the Project.
  6. CD copy of entire schedule, narrative and spreadsheet.

#### SC-16.6 SCHEDULE ORIENTATION SESSION

- A. Contractor shall, within ten (10) days after Notice to Proceed and/or upon notification from the Engineer, attend a Schedule Orientation Session relating to the Schedules and Reports requirements for this Contract. The Schedule Orientation Session is designed to review in detail, the objectives of the Schedules and Reports requirements and the requirements. Contractor shall arrange for its Project Manager, Superintendent, and Scheduler to attend the Schedule Orientation Session.
- B. The following items shall be discussed during the Schedule Orientation Session: (a) The procedures and requirements for the preparation of the Contract Baseline Schedule, and monthly updates by Contractor. (b) how the requirements of the Contract Documents will be monitored and enforced by the Engineer. (c) long-lead items and time requirements for the Work by Subcontractors will be identified and included in the Contract Baseline Schedule. (d) testing and startup. (e) coding and logic for the Contract Baseline Schedule, and (f) identification and scheduling of shop drawings and other submittals.

#### SC-16.7 Schedule of Values

##### A. Submittals

- 1. Contractor shall allocate a dollar value for each activity on the Contract Baseline Schedule. The dollar value for the activity shall be the cost of the Work including labor, materials and equipment. Allowances shall be loaded on activities specifically included for this purpose. No activity on the Contract Baseline Schedule shall exceed a value of \$50,000, unless approved by the Engineer. The sum of all activity costs shall equal the Contract Price. Contractor shall revise the resource and value loading as necessary to gain the acceptance of the Engineer
- 2. The Final Schedule of Values shall incorporate all comments associated with the Contractor's Schedule/Schedule of Values submittals.
- 3. Submit documentation to support the values with data, which will substantiate their correctness, as requested by the Engineer.
- 4. The Schedule of Values, when accepted by the Engineer, shall be used as the only basis for the Contractor's Applications for Payment. The total price paid for mobilization shall be as approved by the Engineer, but in no case shall it exceed three per-cent (3%) of the total bid amount (excluding allowances) and shall be substantiated with invoices and other backup documentation.
- 5. The Schedule of Values shall be derived from the assigned Progress Schedule Activity Values and identified by Activity ID.

##### B. Form and Content of Schedule of Values

- 1. Identify the Schedule of Values submittal with:

- a. Title of Contract and location.
  - b. Contract Number.
  - c. Name and address of Contractor.
  - d. Date of submission.
2. The Contractor's Schedule of Values shall list the installed value of the component parts of the Work in sufficient detail to serve as the basis for computing values for progress payments during construction.
3. Identify accounts with the location code and area code as defined in the Primavera Schedule format and list the number and title of the respective major Section of the Specifications.
4. All accounts in the Schedule of Values shall be derived from the activities in the Progress Schedule. Account data pertaining to the Schedule of Values shall, at a minimum, include the following for each Account:
  - a. CPM Activity number.
  - b. City of Atlanta Standard Code listed on the Bid Schedule.
  - c. Account representative quantities (cubic yards of concrete, tons of steel, etc.), unit costs, person-hours, item and account dollar value.
  - d. WBS code (as used Primavera Project Planner scheduling software), including location, responsibility and area codes.
  - e. CSI Specification Section Number.
  - f. Account Type: Lump Sum (LS), Unit Price (UP), Allowance (AL), or Change Order (CO )
5. The Schedule of Values must be developed separately from the baseline schedule in a tabular electronic format (i.e. a Microsoft Excel Spreadsheet). Upon approval of the Schedule of Values and the Project Baseline Schedule, the Schedule of Values will be merged with the Project Baseline Schedule in P6.

C. Lump Sum Accounts (LS):

1. The Lump Sum Items established in the Contractor's Bid shall be further divided into pay and progress items by the Contractor and submitted to the Engineer for approval, and as specified in SC16.7.A above. Payment for Lump Sum (LS) Accounts will be based upon physical progress (percent complete) for each related activity in the Progress Schedule.
2. The dollar value allocated to Lump Sum Accounts shall be representative of the Contractor's actual costs for performing the work including overhead and profit, and shall be balanced to ensure that sufficient funds are allocated for each portion of the work and shall be subject to acceptance by the Engineer.

3. In the event account values can not be agreed to between the Engineer and the Contractor, the Engineer shall have the exclusive right to determine the account dollar amounts contained in the Schedule of Values.
  4. Mobilization costs shall be specifically identified in the Schedule of Values. All mobilization sub-accounts contained in the Schedule of Values must have a corresponding CPM Schedule activity. Payments for mobilization sub-accounts will be based upon lump sum (LS) values as accepted by the Engineer.
- D. Unit Price Accounts (UP): Payment for Unit Price Accounts shall be based upon actual quantities of Work performed in compliance with the Contract Documents, as verified and accepted by the Engineer. Whenever the actual quantity differs from the estimated quantity on the Unit Price Accounts, the Contractor shall notify the Engineer in writing. Quantity overruns and under runs will be tracked on the Schedule of Values.
- E. Allowance Accounts (AL): Payment for Allowance Accounts will be based upon invoices submitted by the Contractor subject to conditions and limitations of the Contract Documents. Refer to Section 01200, Measurement and Payment, for requirements. The Allowance shall be adjusted to the actual amount paid for such services, and adjusted by Change Order either at the end of that phase of the Work or at the completion of the Work. The City will have sole discretion on determining when to make adjustments to the Allowance.
- F. Cost of materials shall be assigned to the appropriate item of work, and allocated to a materials Sub-account. All materials items contained in the Schedule of Values must have a corresponding CPM Schedule activity, for various portions of the Work:
- a. Except for Allowance Accounts identified in Section 01200, each account shall include a directly proportional amount of the Contractor's overhead and profit.
  - b. For accounts on which progress payments will be requested for materials suitably stored on site, break down the value into:
    - i. The cost of each material delivered and unloaded.
    - ii. Paid invoices will be required for materials.
- G. The Contractor shall include in his Schedule of Values items for site maintenance, and compliance with the terms of permit stipulations, as appropriate. These items will be monitored on a monthly basis. Non-compliance will result in monies being deducted from the appropriate items.
- H. A new account will be added to the Schedule of Values for approved Change Order work. Payment for Time and Materials Change Order work (CO) shall be based upon the General and Special Conditions of these Specifications.



- I. The sum of all Account Values listed in the Schedule of Values shall equal the total Contract Price, excluding Allowance Items.

#### 16.7.1 Sub-Accounts

- A. Include a breakdown of major accounts into sub-accounts on which progress payments will be requested. The sub-account breakdown shall include elements for pay items/progress items as appropriate, and show the weight of each sub-account; e.g., fabrication, installation, etc., with the total weight of the sub-accounts equal to 100 percent of the major account.
- B. The form of the submittal shall be consistent with the Schedule of Values, with each account identified the same as the line item in the Schedule of Values.
- C. The Contractor's Schedule of Values shall list the delivered value of the products, manuals and services provided under the various Specification Sections. The lists shall be sufficiently detailed to serve as a basis for computing values for progress payments during the construction period.
- D. The unit quantity for bulk materials shall include an allowance for waste.
- E. The unit values for the materials shall be broken down into:
  - 1. Cost of the material delivered and unloaded at the site.
  - 2. Copies of paid invoices for component material shall be included with the payment request in which the material first appears.
- F. The installed unit value multiplied by the quantity listed shall equal the cost of that account in the Schedule of Values.
- G. Quantities and unit values identified in the Component Materials sub-accounts shall be used for determining progress payments only, and are not considered to be unit price pay items.

#### SC-16.8 Monthly Application for Payment

- A. Monthly Application for Payment: Contractor shall provide monthly Schedule Update, monthly Payment Report and monthly Narrative Report as his monthly Application for Payment package. Failure to submit all of the aforementioned submittals will result in the termination of the pay application process until all documents are received.
- B. Monthly Schedule Update: The Contractor shall submit, at intervals of 30 calendar days, an update of all activities in the as-planned CPM schedule. The Period-Ending Date shall be the 25<sup>th</sup> of each month. Update shall be created by updating the mathematical analysis and the corresponding computerized network diagram of the Schedule.

1. The schedule shall be updated by entering the following: Actual start and completion dates of completed activities and the actual start date and remaining duration of activities in progress.
  2. The updated network diagram shall be submitted in the same format as noted in Specification Section SC-16.1, with the calendar starting from the date of the update.
  3. The updated mathematical analysis shall be submitted in the same format noted in Specification Section SC-16.1.
  4. The schedule update shall include an update of the cash flow projections in the same format as the original approved submittal.
  5. The schedule update will state the percentage of the work actually completed and scheduled as of the report date.
- C. The Monthly Payment Report shall show the activities or portions of activities completed during the reporting period, their total monetary values and the monetary values earned as a basis for the Contractor's Application for Payment. A mutually agreed upon percent complete will be assigned to each completed and partially completed activity to be used for calculating the monetary value earned to date. For activities underway, the percent complete shall not be related to the remaining duration.
- D. A monthly narrative report shall be submitted each month. Refer to Specification Section SC-16.16 for the requirements of the narrative report.
1. Description of work accomplished.
  2. Summary of safety and quality issues occurring during the month and corrective actions taken.
  3. Contractor evaluation of actual progress versus progress planned.
  4. If the project is behind schedule, progress along all paths with negative float shall be reported along with the reasons for the delay.
  5. A description of all revisions made to the schedule including: all accepted added, deleted, and revised activities; all logic revisions; and all duration revisions.
  6. A description of the problem areas, current and anticipated delaying factors and their impact, and an explanation of corrective actions taken or proposed.
- E. If the Contractor fails to submit any of the required components of the Application for Payment, the Engineer will withhold approval of the Application for Payment until such time as the Contractor submits the required components.

SC-16.9 Progress Meetings and Look-Ahead Schedules

- A. For the weekly progress meetings, the Contractor shall submit a four week Look-Ahead Schedule. This schedule will cover four weeks: the immediate past week, the current week, and the forthcoming two weeks. This schedule will include all activities which are complete, started, are incomplete or underway, or scheduled to be worked during this four week time frame. This schedule shall list all activities from the accepted CPM Construction Schedule which are complete, are scheduled for Work during the period, are currently planned to be worked, even if out of sequence, and Work which is unfinished but scheduled to be finished. Actual start and completion dates shall be provided for the Work that has been completed the prior week; forecast start and finish dates shall be provided for the Work that is in-process or upcoming.
- B. Each activity noted above shall be identified by activity number corresponding to the accepted CPM Construction Schedule and detailed description of the activity.
- C. The Look-Ahead Schedule shall be delivered to the Engineer twenty-four (24) hours prior to the weekly progress meeting.
- D. The Look-Ahead Schedule shall be in a format approved by the Engineer.
- E. Tabular reports for manpower and equipment resources shall be provided for and with each Look-Ahead Schedule.

SC-16.10 CPM Construction Schedule Revisions

- A. The Engineer may direct and, if so directed, the Contractor shall propose, revisions to the CPM Construction Schedule upon occurrence of any of the following instances:
  - 1. The actual physical progress of the Work falls more than five percent (5%) behind the accepted CPM Construction Schedule, as demonstrated by comparison to the accepted monthly CPM Construction Schedule updates or as determined by the Engineer if a current accepted CPM Construction Schedule does not exist.
  - 2. The Engineer considers milestone or completion dates to be in jeopardy because of “activities behind schedule”. “Activities behind schedule” are all activities that have not or cannot be started or completed by the dates shown in the CPM Construction Schedule, regardless of the existence of positive float on the activity.
  - 3. A Change Order has been issued that changes, adds, or deletes scheduled activities or affects the time for completion of scheduled activities.
- B. When the instances requiring revision to the CPM Construction Schedule occur, the Contractor shall submit the proposed revised CPM Construction Schedule within ten (10) working days after receiving direction from the Engineer to provide such Schedule. No

additional payment will be made to the Contractor for preparation and submittal of proposed revised CPM Construction Schedules. However, if the Engineer accepts the proposed revised CPM Construction Schedule, it shall replace and supersede all previous CPM Construction Schedules and substitute for the next monthly CPM Construction Schedule update that would otherwise be required.

- C. Revisions to the CPM Construction Schedule shall comply with all of the same requirements applicable to the original schedule.

#### SC-16.11 Schedule Recovery

- A. If a revised CPM Construction Schedule accepted by the Engineer requires the Contractor to employ additional manpower, equipment, hours of work or work shifts, or to accelerate procurement of materials or equipment, or any combination thereof, as schedule recovery measures to meet Contract milestones, the Contractor shall implement such schedule recovery measures without additional charge to the City. All schedules containing negative float shall mandate the submission of a recovery schedule.
- B. Should it become apparent by the Engineer, that delays to the critical path have resulted in the current monthly update and that these delays are through no fault of the Owner or Engineer and that the Contract completion will not be met, the Contractor shall submit to the Engineer for review a written statement of the steps it intends to take to remove or mitigate the delay to the schedule. The Contractor shall promptly provide such level of effort to bring work back on schedule.
- C. Furthermore, if efforts to recover are not deemed effective as determined by the Engineer, or if prior to submittal of the recovery schedule, the Engineer determines that critical milestones are in jeopardy, the Engineer may direct the Contractor to implement the above or any other recovery efforts at no additional costs to the City.. Under no circumstances will the addition of construction forces, increasing the working hours or any other method, manner, or procedure to recover delays to the CPM Construction Schedule be considered justification for contract modifications or extra work.

#### SC-16.12 Time Impact Analysis Requirement

- A. When delays are experienced by the Contractor and a time extension is requested, the Contractor shall submit to the Engineer a written Time Impact Analysis illustrating the influence of all changes or all delays on the current Project completion date. The time impact analysis shall be constructed on an As-Built Schedule Analysis approach. The As-Built Schedule that is created will incorporate all actual start and finish dates, actual durations of activities, actual sequences of construction (referred to as the As-Built Logic) current as of the time the Time Impact Analysis is performed. This Time Impact Analysis shall incorporate all delays (including Engineer, Contractor and third party delays without exception) in the time frame that they actually occurred with actual logic ties. The As-Built Schedule data shall be obtained from the most recent approved monthly schedule

update. The As-Built Schedule shall be created as an early start schedule with the actual start and finish dates coinciding with the early start and finish dates from the most recent approved monthly schedule update. The As-Built Schedule shall show the original activity durations equal to the actual duration and the actual logic driving all activities. The Engineer will validate this As-Built Schedule. All requests for time extension shall be based upon an analysis of this As-Built Schedule. The critical path will be established and all Engineer -caused delays on the critical path will be identified. The time extension will be based solely upon the cumulative duration of all City and third party caused delays that are on the critical path. Any time extensions to the project's Interim Milestone Dates, if any, shall be non-compensable time extensions only.

- B. Each Time Impact Analysis shall demonstrate the estimated time impact based on the events of delay, the status of construction at that point in time, and the event time computation of all activities affected by the change or delay. The event times used in the analysis shall be those included in the latest approved update of the project schedule, in effect at the time the change or delay was encountered.

#### SC-16.13 Time Allowance for Inclement Weather

- A. The Contractor in the planning and scheduling of its baseline schedule shall consider and include corresponding time for normal weather occurrences in all weather sensitive schedule activities. The amount of time allowed for this inclement weather is defined under GC-24.6. Any activity which could be impacted by normally anticipated inclement weather (precipitation, high or low temperature, wind, etc.), due to the time period which the Contractor has scheduled the work, shall include an adjustment to include the anticipated weather impact from normal weather conditions. "Abnormal Inclement weather" is a lost workday, caused by abnormal inclement weather conditions, and is defined as a day in which the Contractor's workforce cannot work 50 percent or more of the day thereby resulting in a delay to the critical path. The Contractor shall notify the Engineer in writing when a lost workday has occurred due to abnormal inclement weather in accordance with the Contract Specifications requirements. If the number of actual inclement weather delay days exceeds the number of contract allowed inclement weather days, the Contractor will notify in writing the Engineer in accordance with the requirements of GC-26.2 Delays and Extensions of Time of the Contract Specifications. Such delays shall not entitle the Contractor to any additional compensation. The sole remedy of the Contractor shall be to seek a non-compensable extension of time.

#### SC-16.14 Ownership of Schedule Float and Early Completion:

- A. Project float, total float, slack time or contingency within the CPM Construction Schedule (i.e., the difference in time between the projected early completion date and the required Contract completion date), and free float or critical path float within the overall CPM Construction Schedule is for the exclusive use of the Owner. The use of float suppression techniques such as preferential sequencing, special lead/lag logic restraints, extended activity times or imposed dates shall be cause for rejection of the CPM Construction

Schedule and any revisions of updates. The use of float time shall be allowed as directed by the Engineer.

- B. Owner initiated changes that extend or shorten the Contract time shall be the sole basis to adjust the Contract completion date. Delays to the Project critical path for which no justified request for time extensions has been made in accordance with the General Conditions and the General Requirements shall be deemed to be the responsibility of the Contractor.
- C. Contractor agrees that there will be no basis for any Contract modification in regards to an extension of time for project delays, problems or change orders that only result in a loss of shared float in the CPM Construction Schedule.
- D. Any delays to the Contractors proposed early completion date shall be non-compensable and is considered COA-owned Project float which is for the exclusive use of the Engineer.

SC-16.15 Final Schedule As-Built Update:

- A. As a condition precedent to any release of retention, the last update to the CPM Construction Schedule submitted shall be identified by the Contractor as the As-Built Construction Schedule. This As-Built Construction Schedule shall reflect the exact manner in which the project was actually constructed including start and completion dates, activities, sequences and logic ties.
- B. This schedule submission shall be accompanied by a certification signed by an officer of the company and the Contractor's Project Manager and Project Scheduler, stating "To the best of our knowledge, the enclosed final update of the CPM Construction Schedule accurately reflects the actual start and actual completion dates and logical relationship ties of all activities contained herein and represents an accurate depiction of the way in which the project was constructed."

SC-16.16 Requirements of Written Narrative Monthly Progress Report:

Prepare a monthly written narrative progress report to be submitted in conjunction with the required updated CPM Construction Schedule as outlined below.

The narrative report shall contain the following format:

- 1. The Contractors submittal letter.
- 2. Schedule report indicating each activity on the CPM Construction Schedule that has been:
  - a. Completed during the reporting activity period.
  - b. In progress during this reporting period.
  - c. Scheduled for the next reporting period.
- 3. Analysis, by critical path of each negative path describing:

- a. The nature of the critical path.
  - b. Impacts on other activities, milestones and completion dates.
  - c. Recommendations on recovery of the critical path delays.
4. Current and anticipated delays:
  - a. Cause of the delay.
  - b. Corrective measures and schedule adjustments to correct the delay
  - c. Impact of the delay on other activities, milestones and completion dates.
5. Change in construction sequence, logic changes, relationship changes, duration changes and the rationale with such changes.
6. Pending issues and status of other items:
  - a. Permits.
  - b. Contract Modifications.
  - c. Time extension requests.
  - d. Long-lead procurement items.
7. Tabular schedule reports tabulated by:
  - a. Contractor early start activities.
  - b. Total float / early start.
  - c. Area / early start.
  - d. Activity number.
8. Added or deleted activities.
9. Out of Sequence Report describing the necessity of each item activity relationship shown to be out of sequence.
10. Illogical Progress / Restraint Reports.
11. Contract completion date status.
12. Ahead of schedule and number of days.
13. Behind schedule and number of days.
14. Summary of project cost data by appropriate breakdown including budget quantity, cost, percent complete, actions taken to date, actions taken this period, estimate to complete and variances.
15. Summary of project status including cumulative information to date, variances and forecasted completion.
16. Other project or scheduling concerns.
17. Review and update of CPM Schedule.
18. Safety reports and any code violations or warnings.
19. Computer disk containing the latest CPM Construction Schedule update.
20. Provide a list of all equipment supplied to project site, shutdown notices, permits, inspections and dates, approvals, etc.

#### SC-17 COOPERATION WITH OTHER CONTRACTORS AND FORCES

During progress of work under this Agreement, it will be necessary for other contractors and persons employed by the City to work in or about the Project. The City reserves the right to put such other contractors to work and to afford such access to the Site of the work to be performed hereunder at such times as the City deems proper. The Contractor shall not impede or interfere with the work for such other contractors engaged in or about the Services and shall so arrange

and conduct his work that such other contractors may complete their work at the earliest date possible.

When the Contractor and any contractor or subcontractor performing Services under or pursuant to another City Agreement are employed on related or adjacent work, or are using the same materials source, storage area, or disposal area, the contractor shall be responsible to the other for any injury, damage, or loss caused the other by his operations, by his unnecessary delay or hindrance of the other's work, or by his failure to complete the Services or any portion thereof within the time specified for its completion. The Contractor shall indemnify and save harmless the City and the Engineer, and all officers and employees of the City connected with the Services from all claims, suits, or actions of any nature brought on account of any injury, damage, or loss.

Contractor's responsibilities under the preceding paragraph shall be not greater as to any injury, damage, or loss than those imposed on the Contractor or subcontractor under the comparable provision of this Agreement or subcontract.

The Engineer will decide any disputed questions regarding the performance of the Services, access and cleaning up of the site, and priority in all relations between the Contractor and other contractors in utility companies, and maintenance crews.

The Contractor shall cooperate with all other contractors requiring access to the Services for the purpose of maintenance of security, temporary facilities, cleaning of the site, and like matters requiring common effort.

#### SC-18 EXTENDED SHIFT, WEEKEND AND HOLIDAY WORK

The City observes the following holidays:

New Year's Day, Martin Luther King's Birthday, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day and following Friday, and Christmas Day.

Should the Contractor deem it necessary to work on Saturdays, Sundays, holidays or longer than eight hours (8) per shift in order to comply with his construction schedule, or because of any emergency, the Contractor shall request permission of the Engineer to do so at least seven (7) calendar days in advance.

#### SC-19 PROJECT CLOSEOUT

##### SC-19.1 Restoration of Miscellaneous Surface Facilities

Construction operations on the Work may disturb or otherwise damage the surface contours and vegetation of natural and landscaped areas. Restoration of these areas shall be part of the Agreement. Restoration of pavements, trees, and ground vegetation is specified in the Technical Specifications.

##### SC-19.2 Pavement Restoration



Contractor shall secure permits from the appropriate jurisdictional Agency for all pavement restoration prepared in accordance with the requirements of the Agreement Documents and the jurisdictional Agency and submit them to the Engineer.

#### SC-20 EQUIPMENT SERVICE

The Contractor shall furnish the services of a competent factory representative of the manufacturer of the equipment to be installed, for the purpose of supervising and/or inspecting the installation, placing the equipment in service, and calibrating and adjusting each item of equipment. Qualification of the representative shall be appropriate to the type of equipment furnished and subject to the approval of the Engineer. Where equipment furnished has significant process complexity, engineering personnel knowledgeable in the process involved and the function of the equipment shall be furnished. These services shall be furnished in accordance with the requirements of the Technical Specifications.

When approved by the Engineer, periods of service on more than one item of equipment furnished by the same manufacturer may run concurrently. Each of these manufacturers shall furnish supervisory and/or inspection services for all equipment, which he furnishes.

During the initial operation period, a functional test shall be performed on each piece of equipment. The test shall consist of operation of the equipment on a normal duty cycle for a sufficient period of time to determine satisfactory operation (twenty-four [24] hours minimum). To the maximum extent practical, the full capabilities of all equipment shall be exercised, including remote operation, instrumented control schemes, alternate modes of operation, and emergency operation.

#### SC-21 CONCRETE POUR CARD

An approved concrete pour card must be obtained by the Contractor prior to the placement of concrete. The card shall be as provided to the Contractor by the Engineer. The pour card shall be completed by the contractor and approved by the Engineer before concrete is placed.

#### SC-22 PARTNERING STATEMENT

The City intends to encourage the foundation of a cohesive partnership with the Contractor and its subcontractors. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives are effective and efficient Agreement performance, intended to achieve completion within budget, on schedule, and in accordance with plans and specifications.

This partnership will be bilateral in makeup, and participation will be totally voluntary. Any costs associated with effectuating this partnership will be agreed to by both parties and will be shared equally with no change in Agreement price. To implement this partnership initiative, it is anticipated that within sixty (60) days of Notice to Proceed, the Contractor's on-site project manager and the City's on-site representative will attend a partnership development seminar

followed by a team-building workshop, attended by key on-site staff from the Contractor's forces and City's personnel. Follow-up workshops will be held periodically through the duration of the Agreement as agreed by the Contractor and City. The City and Contractor shall mutually agree on a partnering facilitator and off-site facilities for the partnering sessions.

An integral aspect of partnering is the resolution of disputes in a timely, professional, and non-adversarial manner. Alternative dispute resolution methods will be encouraged to promote and maintain amicable working relationships at all levels of the project and to strengthen the partnership.

The mutual goals and objectives of the stakeholders form the Partnering Charter. The charter for each project, then, will be unique to that project. The charter may be a simple statement about communication and cooperation in all matters and resolution of conflicts at the lowest level. The following provides an idea of objectives, which might be included in the charter:

- A. We are a team dedicated to providing a quality project in accordance with the Agreement. We are committed to both employee and public safety, protection of the environment, and minimizing inconvenience to the public.
  - 1. Communication Objectives: We intend to deal with each other in a fair, reasonable, trusting and professional manner including:
    - a. Communicate and resolve problems within the terms of the Agreement;
    - b. Decision making at the lowest possible level;
    - c. Open, honest communication;
    - d. Treat each other with mutual respect, resolve conflicts immediately, and avoid personal attacks;
    - e. Timely notification of future meetings; and
    - f. Do not allow personal antagonism to interfere with professionalism.
  - 2. Conflict Resolution System:
    - a. Step 1: It is preferred that conflict be discussed and resolved at the level on which it originates;
    - b. Step 2: When conflict is not resolved at the originating level, it is taken to the next level of supervision;
    - c. Step 3: When conflict is not resolved at the immediate supervisory level, it is taken to the project manager and engineer; and
    - d. Step 4: When conflict is not resolved by the project manager and engineer, it is submitted to the Disputes Review Board for adjudication.
  - 3. Performance Objectives:

- a. Complete the project without litigation;
- b. Utilize cost reduction incentive proposals;
- c. Finish the project on time;
- d. No delays to project;
- e. No lost time injuries;
- f. Promote positive public relations;
- g. Make the project enjoyable to work on;
- h. Render a finished product everyone can be proud of; and
- i. Construct and administer the Agreement so that all parties are treated fairly.

#### SC-23 COLOR COORDINATION

The City will require a color coordination of architectural materials. All coatings are to be custom matched.

#### SC-24 TIE-INS OR MODIFICATIONS TO EXISTING SYSTEMS

Anytime the Contractor ties into or modifies an existing system, a detailed work plan shall be required. Submittal of this work plan must be a minimum of thirty (30) days in advance of commencement of the subject work. This work plan shall include a detailed description of the work, a step-by-step plan of the modification or tie-in, a schedule, a detailed list of materials and equipment required, demonstrated communications capacity, and a listing of any gates or valves, which must be operated. Working drawings shall be submitted as required under GC-28 for any permanent or temporary structural modifications. A temporary safety plan covering the period of the work, and a listing of contingency plans and supplies, including but not limited to spill prevention planning and spill containment kits, shall be required. A coordination meeting with the City's plant operating staff, the Contractor, the Engineer and the Designer must be held at least seven (7) days prior to the commencement of the modification or tie-in. The day before the commencement of the modification or tie-in, a final coordination shall be held giving final detailed work assignments to all parties involved.

The City and the Engineer have the right to require, at no additional cost to the City, stand-by equipment on any item(s) deemed critical enough to delay the work. The Contractor shall have available stand-by personnel to supplement the committed forces should problems arise. The Contractor is responsible for meeting all OSHA standards including entrance and exit safety, confined space entry, fall protection, scaffolding, rigging, etc.

#### SC-25 NOTICES OF COMMENCEMENT

- A. The Contractor shall file all "Notice of Commencement" required for this Project in accordance with O.C.G.A. § 36-91-92et. seq., as applicable, setting forth:

1. The name, address, and telephone number of the person providing the labor, material, machinery, or equipment;
  2. The name and address of each person at whose instance the labor, material, machinery, or equipment is being furnished;
  3. The name and location of the public work; and
  4. A description of the labor, material, machinery, or equipment being provided and, if known, the Agreement Price or anticipated value of the labor, material, machinery, or equipment to be provided or the amount claimed to be due, if any.
- B. The Contractor shall respond to all requests for copies of a Notice of Commencement. Should the City or Engineer receive such a request, this request will be forwarded to the Contractor for further handling. The name and address of the City shall be as stated as follows:
- City of Atlanta  
Department of Watershed Management  
55 Trinity Avenue, S. W.  
South Tower  
Suite 5400  
Atlanta, Georgia 30303
- C. The name and description of the Project shall be as stated in the Invitation to Bid.

#### SC-26 VALUE ENGINEERING CHANGE PROPOSALS

A. Value Engineering Change Proposals

1. The Contractor may submit Value Engineering Change Proposals (VECP) for changes that the Contractor believes will result in instant Contract savings of at least fifty thousand dollars (\$50,000.00). VECPs will only be considered if the proposed change:
  - a. will result in a net reduction in the Agreement Price;
  - b. will not impair any essential form, fit, function or characteristic of the Work, such as but not limited to, safety, service life, reliability, economy of operation, ease of maintenance, aesthetics and necessary standard features; and
  - c. will not require an extension of the Agreement Time.
2. A VECP shall not increase the risk to cost or schedule of completion.
3. A VECP, if accepted, will be accepted and implemented by Change Order in accordance with this Article.

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## B. Definitions

1. "Collateral Costs", as used herein, means City costs of operation, maintenance, logistics support, or City-furnished property.
2. "Collateral Savings", as used herein, means those measurable net reductions resulting from a VECP in the City's overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.
3. "Contractor's Development Costs", as used herein, mean those costs the Contractor incurs on a VECP specifically in developing, testing, preparing and submitting the VECP. Contractor's development costs will not be recoverable. If the VECP is adopted, the Contractor's share of the savings as hereinafter defined shall be considered full compensation to the Contractor for the VECP.
4. "Implementation Costs", as used herein, means those costs the Contractor incurs to make the contractual changes required by the City's acceptance of a VECP. Such costs will be subject to City audit.
5. "City Costs", as used herein, means those costs the City incurs that result directly from developing and implementing the VECP, such as but not limited to, any net increases in the cost of engineering, testing, operations, maintenance and logistic support. The term also includes the administrative costs of review and processing the VECP.
6. "Instant Agreement Savings", as used herein, means the reduction in Contractor cost of performance (which includes overhead and profit attributable to the reduced or eliminated work), resulting from acceptance of the VECP, minus implementation costs and City costs.

## C. VECP Preparation

1. As a minimum, the Contractor shall include in each VECP the information described below:
  - a. A description of the difference between the existing Agreement requirement and that proposed, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effect of the change on the end item's performance;
  - b. A list and analysis of the Agreement requirements that must be changed if the VECP is accepted, including a recommendation as to how the revisions must be made;
  - c. A separate, detailed cost estimate for (i) the affected portions of the existing Agreement requirement and (ii) the VECP. The cost estimate shall include, without

limitation, both capital cost savings, and life cycle cost savings. The cost reduction associated with the VECP shall take into account the Contractor's implementation costs;

- c. A description and estimate of costs the City may incur in implementing the VECP, such as test and evaluation and operating and support costs;
- e. A prediction of any effects the proposed change would have on collateral costs to the City.
- f. A statement of the time by which a Change Order accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the Agreement Time, achievement of any milestones, or delivery schedule;
- g. Identification of any previous submissions of the VECP, including the dates submitted, and previous actions, (including those of the City) if known;
- h. All specifications, instructions, plans and drawings detailing the implementation of the VECP. All drawings and specifications must be prepared by and sealed by a professional engineer registered in the State of Georgia;
- i. A revised Schedule of Values;
- j. A revised schedule for the affected portion(s) of the Work; and
- k. Any other information required in the judgment of the City to review and/or implement the VECP. Such information shall be provided by the Contractor as soon as practicable after the City's request thereof.

#### D. Processing Procedures

1. Two (2) copies of each VECP shall be submitted to the Engineer. VECPs will be processed expeditiously, however, the City will not be liable for any delay in acting upon or for failure to act upon, any VECP submitted pursuant to this Article. The Contractor may withdraw, in whole or in part, a VECP not accepted by the City within the period specified in the VECP.
2. The City will be the sole judge of the acceptability of a VECP and of the savings and costs from the adoption of all or any part of such proposal. In determining the savings, the right is reserved to disregard the Agreement bid prices if, in the judgment of the City, such prices do not represent a fair measure of the value of the work to be performed or to be deleted. The decision of the City regarding acceptability or unacceptability of the VECP, as well as the savings and costs, shall be final.

3.The City may require the Contractor to modify the VECP to make it acceptable. If any modification increases or decreases the savings resulting from the VECP, the Contractor's fair share will be determined upon the basis of the VECP as modified.

4.The City may accept, in whole or in part, a VECP submitted pursuant to this Article by issuing a Change Order. However, pending issuance of a Change Order, the Contractor shall remain obligated to perform in accordance with the terms of the Agreement.

E. Sharing Arrangements

The Contractor and City shall each receive a fifty percent (50%) share in the Instant Agreement Savings. Upon acceptance of a VECP, a Change Order will be issued reducing the Agreement Price by fifty percent (50%) of the Instant Agreement Savings.

F. Warranty

1.The Contractor shall be, and remain, liable for the effectiveness of the design of the change proposed.

2.The Contractor warrants that such change: shall be free from defects in design, function, configuration and purpose; shall fully perform the function as intended and required by the Agreement Documents; complies with all laws, rules, regulations and ordinances governing such an item; and infringes no patent, copyright, trade secret or other third party proprietary right or interest.

G. Data

To the extent permitted or allowed by law, the City will not disclose, use or duplicate any data provided by the Contractor pursuant to this Article, while such VECP is being evaluated. This restriction shall not apply to any information if it is, or has been obtained, or is otherwise available, from the Contractor or from any other source, without limitation. If a VECP has been accepted, the City shall have the right to duplicate, use and disclose any data in any manner, and for any purpose, and have others do so, under this or any other City Agreement.

SC-27 ENCOUNTERING HAZARDOUS OR POTENTIALLY HAZARDOUS MATERIAL DURING CONSTRUCTION ACTIVITIES

Provide all labor, materials, supplies, and incidentals to protect onsite workers and the surrounding public from exposure to potentially hazardous substances, prevent spread of potentially contaminated or hazardous substances, notify Engineer, and stop all work until notified by the Engineer.

An emergency situation or imminent hazard may include, but is not limited to, the following;

- o Buried drums or containers with unknown or known toxic contents.

- Groundwater or soils of unnatural color
- Spills or leaks of chemicals, solvents, or petroleum products.
- Unusual odors
- Other perceived threats

If a potentially hazardous substance is discovered during construction activities, do not remove it from the site. Leave the potentially hazardous substance in place and stop all work in the immediate area. If the material appears to be leaking or spreading, the Contractor shall contain or abate the spread of material. Take all measures to prevent the release of the material to the environment and protect all onsite workers and the public from potential exposure.

During the course of substance containment or evacuation of site personnel, the Contractor shall protect onsite workers, non-workers, and the general public from contact with or exposure to the contaminated substances or materials.




*Attachment 1*

96"

**Atlanta City Council**

Felicia A. Moore	Council President
Carla Smith	District 1
Amir Farokhi	District 2
Ivory Lee Young, Jr.	District 3
Cleta Winslow	District 4
Natalyn Mosby Archibong	District 5
Jennifer N. Ide	District 6
Howard Shook	District 7
J.P. Matzigkeit	District 8
Dustin Hills	District 9
Andrea L. Boone	District 10
Marci C. Overstreet	District 11
Joyce Sheperd	District 12
Michael Julian Bond	Post 1 At-Large
Matt Westmoreland	Post 2 At-Large
Andre Dickens	Post 3 At-Large

Department of Watershed Management  
Kishia L. Powell  
Commissioner







CITY OF ATLANTA DEPARTMENT OF  
**watershed  
management**

Keisha Lance Bottoms, Mayor

Project Name Goes Here

Cost: \$0.00

DWM Project Hotline Number:  
404-546-3200



@ATLWatershed  
[www.atlantawatershed.org](http://www.atlantawatershed.org)

Department of Watershed Management | A Project of the Five-Year Capital Improvement Plan

48"

# Exhibit C

## Bid Schedule and Pricing Information

To: The City of Atlanta, Georgia

From: \_\_\_\_\_

Submitted: \_\_\_\_\_, 2018.

**Terrell Creek Trunk System Sewer Improvements****FC-10337 Terrell Creek Trunk System Sewer Improvements**

All items listed below shall include furnishing all products, materials, and equipment and performing all labor necessary to complete and put into operation the **FC-10337; Terrell Creek Trunk System Sewer Improvements** Project with the City of Atlanta Department of Watershed Management's drawings, specifications and standards. A unit price must be provided for each cost item unless otherwise noted. An itemized breakdown of costs is required for all items noted with an asterisk (\*). Failure to provide a complete Bid Form and data may deem the bid non-responsive.

*See Section 01200, Measurement and Payment, for a detailed description of cost items. Any items not specifically listed in the Bid Form or Measurement and Payment shall be included in the project and the Bidder shall price all work within the appropriate work items.*

Item No.	Approx. Quan.	Unit	Description	Unit Price Figures	Total Price Figures
<b>A Mobilization</b>					
1-A-1000	1	LS	Mobilization/Demobilization (Not to exceed 3% of Bid Total)		
<b>1 GENERAL</b>					
<b>D Traffic Control (for Work in Commercial Streets)</b>					
1-D-1405	4	LINK	Work Zone Staging and Traffic Control; FC 17-Collector Street (Per Link)		
1-D-1415	3	LINK	Work Zone Staging and Traffic Control; FC 14-Urban Principal Arterial Street (Per Link)		
1-D-1420	2	LINK	Work Zone Staging and Traffic Control; FC 12-Urban Freeway and Expressway (Per Link)		
<b>2 SITEWORK - GENERAL</b>					
<b>H Earthwork</b>					

Item No.	Approx. Quan.	Unit	Description	Unit Price Figures	Total Price Figures
2-H-2910	7105	LF	Clearing, Disposal & Grading for Access Route		
2-H-3020	65	CY	Unsuitable Soil Haul Off & Replace		
2-H-3025	65	CY	Additional Pipe Bedding		
2-H-3900	1100	TON	Surface Stone, In-Place for Access Route		
2-H-3910	5700	LF	Surface Stone and Filter Fabric, Removal from Access Route		
2-H-6900	80	HR	Vacuum Excavation (additional over conventional excavation)		
<b>M</b> <i>Fences &amp; Gates</i>					
2-M-3010	3000	LF	Tree Protection Fence		
<b>N</b> <i>Rip-Rap &amp; Rock Lining</i>					
2-N-1410	2100	SY	Rip Rap		
<b>S</b> <i>Erosion Control Items</i>					
2-S-1010	12	EA	Construction Exit (Co)		
2-S-1225	23100	LF	Sediment Barrier (Silt Fence - Type C)		
2-S-1240	12	EA	Inlet Sediment Trap (Sd2)		
<b>X</b> <i>Concrete Products</i>					
2-X-1410	1370	CY	Flowable Fill		

Item No.	Approx. Quan.	Unit	Description	Unit Price Figures	Total Price Figures
2-X-2420	10	CY	Concrete Encasement (if required)		
<b>4 SEWER COLLECTIONS</b>					
<b>A Pipe – Gravity Pipe</b>					
4-A-2108	26	LF	Sewer Collections, PVC, Gravity Pipe (Replace), 8" Diameter, 0'-8' Cut		
4-A-2208	45	LF	Sewer Collections, PVC, Gravity Pipe (Replace), 8" Diameter, 8'-12' Cut		
4-A-2212	217	LF	Sewer Collections, PVC, Gravity Pipe (Replace), 12" Diameter, 8'-12' Cut		
4-A-1236	3084	LF	Sewer Collections, RCP, Gravity Pipe (Replace), 36" Diameter, 8'-12' Cut		
4-A-1336	4561	LF	Sewer Collections, RCP, Gravity Pipe (Replace), 36" Diameter, 12'-16' Cut		
4-A-1436	2312	LF	Sewer Collections, RCP, Gravity Pipe (Replace), 36" Diameter, 16'-20' Cut		
4-A-1536	317	LF	Sewer Collections, RCP, Gravity Pipe (Replace), 36" Diameter, > 20' Cut		
4-A-5566	10470	LF	Add/Deduct cost for providing 36" DIP in lieu of RCP		
<b>B Manholes, Drops, &amp; Other</b>					
4-B-1048	6	EA	Sewer Manholes, 48" Diameter, 0 - 10' Depth (Pre-Cast Concrete or HDPE)		
4-B-1148	4	VF	Sewer Manholes, 48" Diameter, >10' Depth (Pre-Cast Concrete or HDPE)		
4-B-1448	43	EA	Sewer Manholes, 72" Diameter, 0 - 10' Depth (Pre-Cast Concrete or HDPE)		

Item No.	Approx. Quan.	Unit	Description	Unit Price Figures	Total Price Figures
4-B-1548	304	VF	Sewer Manholes, 72" Diameter, >10' Depth (Pre-Cast Concrete or HDPE)		
4-B-1648	1	EA	Sewer Manholes, 96" Diameter, 0 - 10' Depth (Pre-Cast Concrete or HDPE)		
4-B-1748	18	VF	Sewer Manholes, 96" Diameter, >10' Depth (Pre-Cast Concrete or HDPE)		
<b>C</b> <i>Laterals &amp; Cleanouts</i>					
4-C-1026	9	EA	Service Lateral Replacement 4"-6" Diameter – 12-16' Depth, up to 16 LF		
4-C-3010	9	EA	Sewer, Cleanout, Install at ROW on Private Service		
<b>I</b> <i>Internal Pipe Inspection</i>					
4-I-1050	22000	LF	Sewer, Internal Pipe Inspection, 6" to 24" Diameter		
4-I-1150	130	LF	Sewer, Internal Pipe Inspection, > 24" Diameter		
4-I-6010	225	LF	Sewer, Internal Pipe Inspection, Service Lateral, 4" to 6" Diameter		
<b>K</b> <i>SSES Testing &amp; Other Items</i>					
4-K-1030	1000	LF	Sewer, SSES, Smoke Testing		
4-K-2040	20	EA	Sewer, SSES, Dye Testing, CCTV & Observation		
<b>T</b> <i>Jack &amp; Bore</i>					
4-T-5412	395	LF	Jack-and-Bore, 48" Dia Steel Casing, 36" DIP Dia. Carrier Pipe		

Item No.	Approx. Quan.	Unit	Description	Unit Price Figures	Total Price Figures
<b>X Abandonment/Cap &amp; Plug Removal</b>					
4-X-1018	10000	LF	Sewer, Abandon (grout fill) Existing Sewer Line in Place, 18" Diameter		
4-X-1024	2320	LF	Sewer, Abandon (grout fill) Existing Sewer Line in Place, 24" Diameter		
4-X-1036	122	LF	Sewer, Abandon (grout fill) Existing Sewer Line in Place, 36" Diameter		
4-X-2018	68	EA	Sewer, Cut & Plug Existing Sewer Line, 18" Dia		
4-X-2024	14	EA	Sewer, Cut & Plug Existing Sewer Line, 24" Dia		
4-X-2036	6	EA	Sewer, Cut & Plug Existing Sewer Line, 36" Dia		
4-X-4010	39	EA	Remove & Dispose of Existing Manhole, 0' to 10' Depth, All Sizes		
4-X-4020	234	VF	Remove & Dispose of Existing Manhole, > 10' Depth, All Sizes		
4-X-4030	41	EA	Abandon & Fill Existing Manhole, 0' to 10' Depth, All Sizes		
4-X-4040	164	VF	Abandon & Fill Existing Manhole, > 10' Depth, All Sizes		
<b>6 RESTORATION</b>					
<b>A Asphalt Pavement</b>					
6-A-1410	2050	SY	Asphalt Pavement Patch - Sewer Trench Section		
<b>B Concrete Pavement</b>					
6-B-5410	1570	SY	Concrete Pavement Patch - Open Cut Work in GA DOT Roads, GA DOT Standard 1401		
<b>E Curb &amp; Gutter</b>					
6-E-2410	1152	LF	Concrete and Granite, Curb and Gutter		
<b>F Sidewalks/Ramps/Driveway</b>					

Item No.	Approx. Quan.	Unit	Description	Unit Price Figures	Total Price Figures
6-F-3410	560	SY	Concrete Sidewalk		
6-F-3440	85	SY	Asphalt or Cementitious Concrete Driveway Replacement		
<b>T Trees &amp; Shrubs</b>					
6-T-1015	150	EA	Tree Restoration – All Except Pine		
<b>U Seeding &amp; Sodding</b>					
6-U-2450	1722	SY	Seeding		
6-U-3410	200	SY	Sodding		
Subtotal 1 (Bid Item Sections 1,2,4 and 6) _____					
<b>9</b>			<b>ALLOWANCES</b>		
<b>Z</b>			<b>General Allowances</b>		
9-Z-2410	1	LS	Owner Controlled Contingency	\$ 738,183.02	\$ 738,183.02
9-Z-2480	1	LS	Material Testing	\$ 184,545.76	\$ 184,545.76
9-z-4450	1	LS	City Directed Site Restoration (Private & City Properties)	\$ 123,030.50	\$ 123,030.50
9-Z-4460	1	LS	City Directed Additional Work	\$ 184,545.76	\$ 184,545.76

Subtotal 2 (Bid Item - Section 9 Only) \$1,230,305.04

BID TOTAL, ITEMS 1, 2, 4, 6 AND 9, INCLUSIVE, THE AMOUNT OF (WRITTEN) \_\_\_\_\_



\_\_\_\_\_ DOLLARS (\$\_\_\_\_\_).  
(FIGURE)

The undersigned declares that he understands that the quantities shown are approximate only and are subject to either increase or decrease and that should the quantities of any of the items of work be increased, the undersigned agrees to do the additional work at the unit prices set forth herein, and should the quantities be decreased, he also understands that payment will be made on the actual quantities installed at the unit bid price, and the undersigned will make no claims for anticipated profits for any decrease in the quantities. Actual quantities will be determined upon completion of the job.

The undersigned also agrees that extra work, if any, performed in accordance with Items GC-41 and GC-42 of the General Conditions will be paid for in accordance with the provisions of those Articles.

Amounts shall be shown in both words and figures, where indicated. In case of discrepancies between the figures shown in the unit prices and the totals, the unit prices shall apply and the totals shall be corrected to agree with the unit prices. In case of discrepancies between written amounts and figures, written amounts shall take precedence over figures and the sum of all Bid extensions (of unit prices) plus lump sum items shall take precedence over BID TOTAL.

The bid prices shall include all costs of completion of the work except as otherwise specified in the Contract Documents.

The names and residence addresses of all persons and parties interested in the foregoing bid as principals are as follows:

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(Give first and last names in full. In the case of a corporation, give name of president, treasurer, and manager, and in the case of a partnership, give names and addresses of members.)

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work.

Notice of acceptance should be mailed, telegraphed, or delivered to the undersigned bidder at the following address:

(Name of Bidder)\_\_\_\_\_

(Signature of Authorized Representative)\_\_\_\_\_

(Title)\_\_\_\_\_

(Business Address)\_\_\_\_\_

(City and State)\_\_\_\_\_

(Telephone Number)\_\_\_\_\_

(Fax Number)\_\_\_\_\_

**The following information is required as a part of this Bid.**

BID DATA

The Bidder shall designate below the one manufacturer or source for each product listed to be furnished and installed if awarded the Work. The Bidder understands that if this information is not provided, offering products meeting all Specification requirements and having the approval of the Owner, then the Owner reserves the right either to determine the Bidder non-responsive and reject the Bid or to designate the manufacturer of the products to be provided which will meet all specification requirements, which Owner-designated manufacturer products must be furnished by the Bidder at no increase in the Contract Price.

1. Product: High Density Polyethylene Pipe (HDPE)  
Manufacturer: \_\_\_\_\_
2. Product: Ductile Iron Pipe (DIP)  
Manufacturer: \_\_\_\_\_
3. Product: Steel Casing Pipe  
Manufacturer: \_\_\_\_\_
4. Product: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_
5. Product: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_
6. Product: \_\_\_\_\_  
Manufacturer: \_\_\_\_\_

END OF BIDDING DOCUMENTS

# Exhibit D

## Scope of Work

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**SECTION 01010****Summary of Work****PART 1 – GENERAL****1.01 SCOPE**

- A. The Work to be performed under this Contract shall consist of furnishing all plants, tools, equipment, materials, supplies, and manufactured articles and furnishing all labor, transportation, and services, including fuel, power, water, and essential communications, and performing all work, or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The Work shall be complete, and all work, materials, and services not expressly indicated or called for in the Contract Documents, which may be necessary for the complete and proper construction of the Work in good faith, shall be provided by the Contractor as though originally so indicated, at no increase in cost to the City.
- B. The quantities shown on the bid form are estimates for the work including the intended rehabilitation method based upon the available information. The assigned means, methods and quantities described herein are subject to revision by the City for various reasons including but not limited to, unforeseen utility conflicts, discovery of subsurface rock strata, unforeseen pipeline encasement, etc. As such, a unit price contract type has been selected to prosecute the work and is not intended to be a guarantee for a minimum amount of work.

**1.02 PROJECT LOCATION**

- A. The Work is located in the northwest area of the City of Atlanta, GA, starting and west of Howell Mill Rd. See the contract drawings for the exact location near the intersection of Baker Rd. and Baker circle and ending within the vicinity of Hollywood Rd. where the sewer connects to the existing Lower Proctor Creek Trunk.

**1.03 WORK COVERED BY THE CONTRACT DOCUMENTS**

- A. The Contract comprises of upsizing select a portion of the Ashby-Jett sewer line in the City of Atlanta, as designated by the Engineer throughout the course of the work. The Work includes but is not limited to the below items:
  - 1. Bypass Pumping.
  - 2. Pre and Post CCTV Inspection.
  - 3. Replacing existing pipe using conventional open cut methods.

4. Replacing existing pipe using pipe-bursting methods.
  5. Replacing existing pipe using jack-and-bore method.
  6. Rehabilitation, replacement, and or installation of sewer manholes and appurtenances.
  7. Erosion Control.
  8. Traffic Control.
  9. Remove and/or replace trees.
  10. Pavement restoration
- B. Other work associated with the above items. All Work shall be performed according to the requirements of the Contract Documents.

#### **1.04 WORK COORDINATION**

- A. The Contractor shall coordinate the Work with third parties (such as public utilities and telephone company) in areas where such parties may have rights to underground property or facilities; and request maps or other descriptive information as to the nature and location of such underground facilities or property.
- B. The Contractor shall also coordinate the Work with owners of private and public property where access is required for the performance of the work. Legal access will be acquired by the Contractor in accordance with Section 01351.
- C. The City will work with the Contractor to assign and schedule the work in a logical and efficient format. However, all items in this contract shall be priced such that each item can be assigned independently or combined with other items at the City's sole discretion in regard to both quantity and scope. There shall be no consideration of any claim for extra payment arising from a decision by the City to assign potential work items under this contract in any combination or in combination with another contract utilizing alternate technologies. The Contractor shall perform only those work items directed by the Department of Watershed Management at the prices specified herein.

#### **1.05 CONDITIONS AT THE SITES**

- A. The Contractor shall make all necessary investigations to determine the existence and location of underground utilities.

- B. The Contractor will be held responsible for any damage to and for maintenance and protection of existing utilities, structures, and personal property.
- C. Nothing in these Contract Documents or associated Drawings shall be construed as a guarantee that such utilities are in the location indicated or that they actually exist, or that other utilities are not within the area of the operations.

END OF SECTION

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## SECTION 01040

### Project Coordination

#### PART 1 – GENERAL

##### 1.01 SCOPE

- A. Management of the Project shall be with a logical method of construction planning, inspection, scheduling and cost value documentation.
- B. The work under this Section includes all surface and subsurface condition inspections and coordination by the Contractor necessary for the proper and complete performance of the Work.
- C. This Section applies to the work of every division and every section of these Specifications.
- D. The Contractor shall become thoroughly familiar with the requirements of the Contract Documents, as well as jobsite conditions and the work of separate contractors (if any), and shall make any adjustments necessary to maintain the Project schedule.
- E. Close coordination will be required by the Contractor with the City, Engineer, other authorities having jurisdiction, separate contractors (if any), and others having an interest in the Project. Through close coordination, the Contractor will ensure that all work on the site, access to and from the site, and the general conduct of the operations is maintained in a safe and efficient manner, and that disruption and inconvenience to existing streets and property are minimized.

##### 1.02 SITE CONDITIONS

- A. Inspection:
  - 1. Prior to performing any work under a section, the Contractor shall carefully inspect the installed work of other trades and verify that all such work is complete to the point where the work under that section may properly commence.
  - 2. The Contractor shall verify that all materials, equipment, and products to be installed under a section may be installed in strict accordance with the original design and pertinent reviewed shop drawings.

3. Observation of the Work by the Engineer or others shall not be interpreted as relieving the Contractor of its responsibility for the coordination of all Work, superintendence of the Work, or scheduling and direction of the Work.
- B. Discrepancies:
  1. In the event of discrepancy, immediately notify the Engineer.

### **1.03 EXISTING FACILITIES**

- A. The existing services shall remain in FULL operation while new construction is in progress.
- B. The Contractor shall coordinate the work with the City so that the construction will not restrain or hinder the operation of the existing wastewater facilities. If, at any time, any portion of the wastewater facilities is out of service, the Contractor must obtain prior approval from the City as to the date, time, and length of time that portion of the wastewater facilities is out of service.
- C. Connections to the existing facilities or alteration of existing facilities will be made at times when the piping or facility involved is not in use, or at times, established by the City, when the use of piping or facility can be conveniently interrupted for the period needed to make the connection or alteration.
- D. After having coordinated the work with the City, the Contractor shall notify the Engineer of the time, time limits, and methods of each connection or alteration and have the approval of the Engineer before any work is undertaken on the connections or alterations.
- E. Before any roadway or facilities are blocked off, the City's approval shall be obtained to coordinate operations for these facilities, and any signage, plating, bypass pumping, sinking of bypass conduits, ramping, or any other temporary accommodation work shall be implemented by the contractor as directed by the City.

### **1.04 COORDINATION**

- A. Carefully coordinate work with all other trades and subcontractors to insure proper and adequate interface of the work of other trades and subcontractors with the work of every section of these Specifications.
- B. The Contractor shall coordinate operations with all utility companies in or adjacent to the area of Contractor's work. The Contractor shall require said

utility companies to identify/ field verify location of each of their respective utility and provide drawings as necessary to locate them.

- C. The Contractor shall so schedule the Contractor's Work that the Contractor does not interrupt the operation of any existing facility, including water mains and sewers. In the event certain tie-ins or other operations make it necessary to interrupt the operation of existing facilities, the City will be notified and such work will be done at a time and in a manner acceptable to the City /Engineer.

END OF SECTION

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**SECTION 01055**

**CONSTRUCTION STAKING**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. Construction staking shall include all of the surveying work required to layout the Work and control the location of the finished Project. The Contractor shall have the full responsibility for constructing the Project to the correct horizontal and vertical alignment, as shown on the Drawings, as specified, or as ordered by the Engineer.
- B. The Contractor shall assume all costs associated with rectifying work constructed in the wrong location.

**1.02 QUALITY ASSURANCE**

- A. The Contractor shall hire, at the Contractor's own expense, a Surveyor with current registration in the State of Georgia, acceptable to the Owner, to provide project construction staking and confirmation of the vertical and horizontal alignment.
- B. Any deviations from the Drawings shall be confirmed by the Engineer prior to construction of that portion of the Project.

**1.03 SUBMITTALS**

- A. Submit name and address of Registered Surveyor to Engineer.
- B. On request of Engineer, submit documentation to verify accuracy of construction staking.
- C. Submit record drawings in accordance with PART 3 of the Section.

**PART 2 PRODUCTS**

**(NOT USED)**

**PART 3 EXECUTION**

**3.01 PROJECT CONDITIONS**

- A. The Drawings provide the location of principal components of the Project. The

Engineer may order changes to the location of some of the components of the Project or provide clarification to questions regarding the correct alignment.

B. The Engineer will provide the following:

1. One vertical control point on the Project site with its elevation shown on the Drawings.
2. A minimum of two horizontal control points on the Project site with their coordinates shown on the Drawings.

### **3.02 GENERAL**

A. From the information shown on the Drawings and the information to be provided as indicated in paragraph 3.01 above, the Contractor shall:

1. Be responsible for establishing GPS control coordinate control system, setting reference points and/or offsets, establishment of baselines, and all other layout, staking, and all other surveying required for the construction of the Project.
  - a. The horizontal position of all points shall be referenced to the North American datum of 1983 (1986 adjustment) in the Georgia State Plane West 1002 Coordinate System.
  - b. The vertical position of all points shall be referenced to the North American Vertical datum of 1988.
  - c. All coordinate values shall be delivered as grid coordinates in US Survey Feet.
  - d. The minimum data accuracy required for all record drawings shall be +/- 0.10 USFT (one tenth of one foot).
2. Safeguard all reference points, stakes, grade marks, horizontal and vertical control points, and shall bear the cost of re-establishing same if disturbed.
3. Stake out the limits of construction to ensure that the Work does not deviate from the indicated limits.
4. Stake out the pipeline horizontal and vertical alignment.
5. Be responsible for all damage done to reference points, baselines, center lines and temporary bench marks, and shall be responsible for the cost of re-establishment of reference points, baselines, center lines and

temporary bench marks as a result of the operations.

6. Maintain a complete, accurate log of all control and survey work as it progresses.

- B. Baselines shall be defined as the line to which the location of the Work is referenced, i.e., edge of pavement, road centerline, property line, right-of-way or survey line.

### **3.03 STAKING PRECISION**

- A. The precision of construction staking shall match the precision of components location. Staking of utilities shall be done in accordance with standard accepted practice for the type of utility.
- B. The precision of construction staking required shall be such that the location of the sanitary and/or storm sewers can be established for construction and verified by the Engineer. Where the location of components/appurtenances of the sanitary or storm sewer ( i.e. manholes, drain inlets, etc.) are not dimensioned, the establishment of the location of these components shall be based upon scaling these locations if drawings are not provided with relation to readily identifiable land marks, i.e. survey reference points, power poles, manholes etc.
- C. Paved Surfaces: The Contractor shall establish a reference point for establishing and verifying the paving subgrade and finished grade elevations. Any variance with grades shall be identified by the Contractor and confirmed by the Engineer prior to constructing the base.
- D. The Contractor's attention is directed to Section 01040, Paragraph 3.06.

### **3.04 RECORD DRAWINGS**

- A. Sanitary and Storm Sewers
  - 1. The Contractor shall submit record drawings which show the final installed location of the sewer and storm drain and survey data for all installed sanitary and storm sewer pipe and service connections. Survey data shall consist of final coordinates for all manholes, catch basins, tunnel and casing limits, CIP/pipe bursting delineations, service connections and invert elevations for all manholes, catch basins and other structures.

- B. The record drawings shall also indicate the horizontal and vertical location, dimensions and materials of all utilities encountered during excavation.
- C. 2 full size hard copies of record drawings shall be furnished to the Engineer for review. Each record drawing shall be stamped with the name of the Contractor, signed and dated by the Contractor's Project Manager and signed, sealed and dated by the Surveyor. Also provide 2 compact disks containing signed and sealed PDFs of the final record drawings.
- D. The Contractor's attention is directed to GC-28.4 and GC-38.5 relative to maintenance and submittal of Record Drawings.

**+ + + END OF SECTION 01055 + + +**



**SECTION 01060**

**REGULATORY REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. Permits and Responsibilities: The Contractor shall be responsible for complying with all applicable federal, state, county and municipal laws, codes and regulations, in connection with the prosecution of the Work and for obtaining any and all permits including but not limited to NPDES permits for storm water discharges from the Work site.
- B. Permits and applications for this project are identified in Part 3 of this Section.
- C. The Contractor shall take proper safety and health precautions to protect the Work, the workers, the public and the property of others. Contractor shall comply with all requirements of the permitting authority, whether permits were obtained by the Contractor or not.

**PART 2 PRODUCTS**

**(NOT USED)**

**PART 3 EXECUTION**

**3.01 NPDES PERMITS FOR STORM WATER DISCHARGES**

- A. The Contractor shall comply with the provisions of the Authorization to Discharge under the National Pollutant Discharge Elimination System, Storm Water Discharges Associated with Construction Activity for Infrastructure Construction Projects, Georgia Environmental Protection Division General Permit No. GAR 100002, including but not limited to filing permit applications, filing Notice of Intent (NOI), filing Notice of Termination (NOT), performing inspections and monitoring and performing record keeping as required.

**3.02 GDOT ENCROACHMENT PERMITS**

- A. Portions of this project may be constructed within right of ways under the jurisdiction of Georgia Department of Transportation (GDOT).
- B. The Contractor will submit permit applications to GDOT for Right of Way Encroachment for installation of pipelines and appurtenances and connections to existing pipelines for the above areas.

**3.03 CITY LANE CLOSURE PERMITS**

- A. The City/Engineer, in conjunction with the Contractor, will submit permit applications to the City's Department of Public Works, Office of Transportation for all lane/road closures required for completion of the project. Refer to Section 01550, Traffic Regulation.

**3.04 OTHER PERMITS**

- A. The Contractor shall submit applications for and obtain all other permits required in conjunction with completion of the Work of the Contract.

**3.05 GENERAL**

- A. The Contractor shall pay for all remaining permits, fees and licenses required for construction of the project. Payment for all permits, fees and licenses required for construction shall be reimbursed to the Contractor under Allowance Item entitled Special Permit Requirements.
- B. The Contractor shall examine all permits and agreements and conform to the requirements contained therein, including the purchase of additional bonds or insurance as specified therein, and such requirements are hereby made a part of these Contract Documents as though the same were set forth herein. Failure to examine the permit and agreement applications will not relieve the Contractor from compliance with the requirements stated therein.

**+ + + END OF SECTION 01060 + + +**

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**SECTION 01091****CODES AND STANDARDS****PART 1 GENERAL****1.01 DESCRIPTION**

- A. Whenever reference is made to conforming to the standards of any technical society, organization, body, code or standard, it shall be construed to mean the latest standard, code, specification or tentative specification adopted and published at the time of advertisement for Bids. This shall include the furnishing of materials, testing of materials, fabrication and installation practices. In those cases where the Contractor's quality standards establish more stringent quality requirements, the more stringent requirement shall prevail. Such standards are made a part hereof to the extent which is indicated or intended.
- B. The inclusion of an organization under one category does not preclude that organization's standards from applying to another category.
- C. In addition, all work shall comply with the applicable requirements of local codes, utilities and other authorities having jurisdiction.
- D. All material and equipment, for which a UL Standard, an AGA or NSF approval or an ASME requirement is established, shall be so approved and labeled or stamped. The label or stamp shall be conspicuous and not covered, painted, or otherwise obscured from visual inspection.
- E. The standards which apply to this Project are not necessarily restricted to those organizations which are listed in Article 1.02.

**1.02 STANDARD ORGANIZATIONS**

- A. Piping and Valves:

ACPA	American Concrete Pipe Association
ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
AWWA	American Water Works Association
CISPI	Cast Iron Soil Pipe Institute
DIPRA	Ductile Iron Pipe Research Association
FCI	Fluid Controls Institute
MSS	Manufacturers Standardization Society

NCPI	National Clay Pipe Institute
NSF	National Sanitation Foundation
PPI	Plastic Pipe Institute
	Uni-Bell PVC Pipe Association

B. Materials:

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials

C. Painting and Surface Preparation:

NACE	National Association of Corrosion Engineers
SSPC	Steel Structures Painting Council

D. Aluminum:

AA	Aluminum Association
AAMA	American Architectural Manufacturers Association

E. Steel and Concrete:

ACI	American Concrete Institute
AISC	American Institute of Steel Construction, Inc.
AISI	American Iron and Steel Institute
CRSI	Concrete Reinforcing Steel Institute
NRMA	National Ready-Mix Association
PCA	Portland Cement Association
PCI	Pre-stressed Concrete Institute

F. Welding:

ASME	American Society of Mechanical Engineers
AWS	American Welding Society

G. Government and Technical Organizations:

APHA	American Public Health Association
APWA	American Public Works Association
ASA	American Standards Association
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASQC	American Society of Quality Control
ASSE	American Society of Sanitary Engineers

CFR	Code of Federal Regulations
CSI	Construction Specifications Institute
EPA	Environmental Protection Agency
FS	Federal Specifications
IAI	International Association of Identification
ISEA	Industrial Safety Equipment Association
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
MUTCD	Manual of Uniform Traffic Control Devices
NBFU	National Board of Fire Underwriters
NFPA	National Fluid Power Association
NBS	National Bureau of Standards
NISO	National Information Standards Organization
OSHA	Occupational Safety and Health Administration
SPI	Society of the Plastics Industry, Inc.
USDC	United States Department of Commerce
WEF	Water Environment Federation

H. Roadways:

AREMA	American Railway Engineering and Maintenance-of-Way Association
GDOT	Georgia Department of Transportation

I. Plumbing:

AGA	American Gas Association
PDI	Plumbing Drainage Institute
SPC	SBCC Standard Plumbing Code

J. Equipment:

AFBMA	Anti-Friction Bearing Manufacturers Association, Inc.
AGMA	American Gear Manufacturers Association
CEMA	Conveyor Equipment Manufacturers Association
DEMA	Diesel Engine Manufacturers Association
OPEI	Outdoor Power Equipment Institute, Inc.
PTI	Power Tool Institute, Inc.
RIA	Robotic Industries Association
SAMA	Scientific Apparatus Makers Association

### 1.03 SYMBOLS

Symbols and material legends shall be as scheduled on the Drawings.

**PART 2 PRODUCTS**

**(NOT USED)**

**PART 3 EXECUTION**

**(NOT USED)**

**+ + + END OF SECTION 01091 + + +**

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**SECTION 01200**

**Measurement and Payment**

**PART 1 – GENERAL**

**1.01 SCOPE**

- A. Work includes furnishing all plant, labor, equipment, tools, materials, and performing all operations required to complete the Work satisfactorily, in-place, as specified and as indicated on the Drawings.
- B. All costs of required items of work and incidentals necessary for the satisfactory completion of the Work shall be considered as included in the Total Bid. The cost of work not directly covered by the pay items shall be considered incidental to the contract and no additional compensation shall be allowed.
- C. The Contractor shall take no advantage of any apparent error or omission on the Drawings or Specifications, and the Engineer shall be permitted to make corrections and interpretations as may be deemed necessary for fulfillment of the intent of the Contract Documents.

**1.02 UNIT PRICE ITEMS**

- A. Payment for all work shall be in accordance with the unit price bid items in the Bid Schedule and shall be full compensation for all labor, materials, and equipment required to furnish, install, construct, and test the Work covered under the unit price bid item. Work for which there is no price schedule item will be considered incidental to the Work and no additional compensation shall be allowed.
- B. Payment will be made only for the actual quantities of work performed in compliance with the Drawings and Specifications. The Contractor will be paid an amount equal to the approved quantity times applicable unit price. Any unused balance of the unit price work shall revert to the City upon completion of the project.
- C. All unit price work shall be considered as part of the Work to be performed within the time limits specified elsewhere for Substantial Completion and Project Completion. No increase in contract time will be allowed for increases in quantities of unit price work performed beyond the quantities shown in the Bid Schedule, unless it can be demonstrated that the additional Work performed under the unit price item is on the critical path of the Project Schedule.

### 1.03 MEASUREMENT OF QUANTITIES

- A. The basis of payment will be the unit prices and/or lump sum amounts included in the Contractor's bid. The distances stated for pipeline and manhole rehabilitation work are the City's best estimate of work to be performed by this contract. Payment for pipeline rehabilitation, pipe replacement or any other items of work for which payment will be made on a linear foot or vertical foot basis will be based on the Contractor's measurement, contingent on verification by City inspectors. Nothing in this Section shall be construed as providing for additional payment beyond the bid items. Prices will include, but not limited to all labor, equipment and materials necessary for a complete installation in accordance with the Contract Documents. All incidental work necessary for a complete and operable project shall be included in the price bid. No payment will be made for partially completed bid items.
- B. Measurement Devices
1. Scales shall be inspected, tested, and certified by the applicable Weights and Measures Departments within the past year and shall be of sufficient size and capacity to accommodate the conveying vehicle.
  2. Metering devices shall be inspected, tested, and certified by the applicable department within the past year.
  3. Volume shall be determined by cubic dimension by multiplying mean length by mean width by mean height or thickness.
  4. Area shall be determined by square dimension by multiplying mean length by mean width or height.
  5. Linear measurement shall be measured by linear dimension, along the item centerline or mean chord.
  6. Stipulated price measurement shall include items measured by number, weight, volume, area, length, or combination thereof as appropriate

Item	Description	Method of Measurement
AC	Acre	Field Measure
AL	Allowance	
CY	Cubic Yard	Field Measure within limits specified or shown, or measured in vehicle by volume, as specified
DAY	Calendar Day	
EA	Each	Field Count
GAL	Gallon	Field Measure
HR	Hour	
LB	Pound(s)	Weight Measure by Scale
LF	Linear Foot	Field Measure
LS	Lump Sum	Unit is one; no measurement will be



Item	Description	Method of Measurement made
SF	Square Foot	
SY	Square Yard	
TON	Ton	Weight Measure by Scale (2,000 lb)
VF	Vertical Foot	Field Measure

## PART 2 – BID ITEMS

### 2.01 GENERAL CONDITIONS

- A. Mobilization/Demobilization (Not to Exceed 3% of Bid Total) – Bid Item 1-A-1000: Contractor will be paid a lump sum amount for all costs associated with the mobilizations and demobilizations of equipment, and project management as directed by the Engineer for the project. The first payment will be remitted for mobilization up to a maximum of 50% the amount bid upon Engineer's verification that the Contractor has fully provided all necessary personnel, such as labor, equipment, materials, field offices, parking areas, staging areas, safety signage, public outreach, project signs (four each) per Special Conditions Section SC-14 and Section 01351, magnetic vehicle signs and yard signs per Section 01580, administrative items, etc. necessary to commence the Work. The remaining 50% will be remitted at the mid-point of the project.

Project Management shall include incidental cost associated but not limited to the General Conditions, and Special Conditions, Project Controls, Submittals, Quality Assurance-Quality Control, Temporary Facilities & Construction Operations, Project Identification and Signs, Transportation and Handling, Storage and Protection, Record Documents, Retrieval Systems for Manholes, Site Preparation, Permits, Safety & Security, police officers, and overhead. The remainder of the amount bid will be remitted based on a percentage of liner installed on a monthly basis and upon satisfactory demobilization and restoration of the various project areas upon completion of the Work, provision of all project record documentation and any other close-out type of documentation required.

The Contractor will be paid for providing, implementing and utilizing the project control tools as specified in Special Conditions Section SC-16 and Section 01350. The payment shall include qualified personnel to operate the specified tools, software licenses, training sessions, training manuals, and consulting services for setup and implementation as required and specified.

The maximum amount for this item shall not exceed 3% of the total bid. The payment shall be on a LUMP SUM (LS) basis, which includes furnishing all

materials, labor, and incidentals necessary to complete the work prorated throughout the life of the project.

- B. Work Zone Staging and Traffic Control, Various Functional Classifications (Per Link) – Bid Items 1-D-1405, 1-D-1415, and 1-D-1420: The Measurement for payment will be per link. Payment will constitute full compensation for all costs for furnishing, installing, maintaining and removing work zone staging and temporary traffic control per each link of roadway based upon the current functional classification of the affected roadway as defined by the Federal Highway Administration. The term affected roadway shall be defined as the limits of physical construction activity and shall not include peripheral signage or other traffic control related activities which may be required. A link is defined as a section roadway between two nodes or intersections. In the event a single work zone spans one or more intersections, the average link length will be used to determine the eligible quantity of work zones for payment. The unit price bid shall include, but not be limited to furnishing, installation, maintenance and removing all traffic control devices, temporary signage, temporary pavement markings and shall include flagging, permits and other means necessary for safe guidance and protection of vehicular and pedestrian traffic through the Work Zone to complete the entire scope of work which is located within or requires traffic control of the designated roadway link based upon the functional classification and site conditions. No additional payment will be remitted for multiple work zone staging or traffic control setups. An initial payment not to exceed 50% of the unit price bid will be remitted for satisfactory establishment, staging and traffic implementation upon completion of pre-construction survey services and provision of corresponding CCTV files. The remaining payment will be remitted upon completion of all work on the affected link including provision of post construction CCTV files. Separate payment will not be made for the provision of uniformed traffic control officers required as part of a permit. If police officers are not required by a permit, but are requested by the City, separate payment will be made. All traffic control measures and plans shall conform to the requirements of the Manual on Uniform Traffic Control Devices (MUTCD), Part 6 (Temporary Traffic Control), latest edition, as published by the US DOT / FHWA. The above referenced bid items are applicable to work within roadways with the following functional classifications:

- 17- Collector Street
- 16- Minor Arterial Street
- 14- Urban Principal Arterial
- 12- Urban Freeway and Expressway
- 11- Interstate Principal Arterial

Functional Classification Maps for the Atlanta Metro Counties are available through Georgia's Department of Transportation (GDOT) website at [http://www.dot.state.ga.us/DOT/plan-prog/transportation\\_data/function\\_class\\_maps/index.shtml](http://www.dot.state.ga.us/DOT/plan-prog/transportation_data/function_class_maps/index.shtml). In the event that a functional classification assignment conflict exists between the drawings and the GDOT, the GDOT classification shall preside. The contractor shall submit proposed traffic control plans to the Engineer at least 48 hours before the work begins for authorization. Payment may be withheld at the discretion of the Engineer if plans are not submitted for authorization in a timely manner. Traffic control for roadways with "local" or "rural" functional classifications are considered incidental to the work and the cost shall be included in the unit price for the work performed (including provision of uniformed traffic control officers if required). No separate payment will be made for traffic control roadways with functional classification other than those stated herein, unless otherwise authorized by the Engineer for exceptional circumstances.

## **2.02 SITEWORK - GENERAL**

- A. Clearing, Disposal & Grading for Access Route - Bid Item 2-H-2910: Measurement for payment will be per linear foot (LF). Payment will constitute full compensation for all costs associated with clearing, disposal, rough grading and geotextile underlayment for grading and preparation work necessary to install a 10 foot wide, 6 inch deep construction access route in accordance with Section 02112 – Route Clearing, when authorized by the Engineer. The payment shall be made per linear feet of access route measured along the centerline of site access route from the point of commencement of construction to the furthest point of required access. Payment shall include, but not be limited to furnishing arborist tree survey, site plan, arborist tree removal permit, construction layout, clearing, grubbing, debris removal, grading, geotextile underlayment, labor, equipment and materials for the establishment of erosion control (except those erosion control items paid for elsewhere). Clearing shall also include removal of all interfering or objectionable material in the site access way, temporary drainage, and grading as necessary to facilitate equipment access to the work site. Payment will not be remitted for light clearing, disposal and grading of vegetative areas comprised of trees, brush or shrubs less than 6 inch caliper as this is considered light brush typically displaced with construction equipment.
- B. Unsuitable Soil Haul Off & Replace - Bid Item 2-H-3020: All soil determined to be unsuitable for backfill shall be removed and replaced. Soil shall be determined to be unsuitable by the Engineer in accordance with Specification Section 02200 – Earthwork in non paved areas. All costs for removal, hauling and disposal of the unsuitable material, as well as the cost for hauling and placing imported fill material shall be included in the unit

price. Payment will be made on the basis of cubic yards (CY) removed with replacement amount not to exceed the minimum backfill limits indicated on GC-2/ Detail 14, trench type I for flexible or rigid pipe installation. Payment will not be remitted for removal and replacement of unsuitable soil beyond the aforementioned trench limits regardless of the actual excavation/ trench dimension unless prior written authorization is provided by the Engineer.

- C. Additional Pipe Bedding Material - Bid Item 2-H-3025: Measurement for payment will be per cubic yard (CY) installed. Payment will constitute full compensation for all costs associated with additional pipe bedding material. Additional pipe bedding material is classified as bedding material needed to stabilize the base of a trench in addition to the pipe bedding specified in the Section 02200 and Drawing Details, provided that the trench excavation is properly de-watered per Specification Section 02140. The cost to install additional bedding, including all labor, equipment and materials, shall be included in the unit cost bid.
- D. Surface Stone, In-Place for Access Route - Bid Item 2-H-3900: Measurement for payment will be per ton of surge stone (4-inch to 6-inch size rip-rap) acceptably placed in accordance with Section 02112 – Route Clearing. Payment will constitute full compensation for all costs for all blading, finish grading, surge stone, and compaction work required to provide a stone surfaced route competent to support the weight of all vehicles and equipment required to perform the sewer rehabilitation work.. Stone tonnage shall be measured by load delivery tickets containing a printout of the net stone weight from a certified scale. Each delivery ticket shall be initialed and dated by the City Inspector on the date of placement. A copy of all applicable delivery tickets shall accompany each request for payment of this item. Payment under this item shall include full compensation for this work.
- E. Surface Stone and Filter Fabric, Removal from Access Route – Bid Item 2-H-3910: Measurement for payment will be per linear foot (LF). Payment will constitute full compensation for all costs associated with removal of the surge stone and filter fabric installed to access sewer rehabilitation site(s). The unit price shall include all costs associated with the removal and storage of stone and filter fabric, as well as backfill, compaction, grading and grassing to restore the site. The Contractor shall include all costs for transportation of stone and/or filter fabric, and/or disposal of debris resulting from the removal and site restoration. Surge stone and filter fabric shall only be removed by the Contractor when the road encroaches on private property outside of the sewer easement, or when directed by the Engineer.
- F. Vacuum Excavation (additional over conventional excavation) – Bid Item 2-H-6900: Measurement for payment will be per hour (HR) for the duration that actual excavation is being performed. Payment will constitute full compensation for all costs associated with all labor, tools, and equipment

required to complete the excavation and store, transport and dispose of the excavated materials in accordance with Section 02200. Vacuum excavation will be utilized in locations where it is not practical, safe or feasible to excavate material within a 24" tolerance zone of a sensitive utility or structure as required by the Georgia Utility requirements. Vacuum excavating equipment shall utilize high-pressure air or water injection to dislodge soil for safe removal by the vacuum system. Vacuum system equipment shall include a tank to store materials removed for transport to disposal location. No separate payment will be made for vacuum excavation of the sewer main for replacement, point repairs, service lateral reconnection/replacement, launch/receive pits or manholes unless a separate sensitive utility or structure tolerance zone is encountered as described above. ALL cost for sewer excavation work, including any vacuum excavation that may be necessary shall be included in the price for the sewer replacement/repair/reconnect items, as this is intrinsic to the work being performed. Payment will not be made for equipment resting idle at the site.

- G. Tree Protection Fence - Bid Item 2-M-3010: Measurement for payment will be per linear foot (LF) for tree protection fence suitably installed and maintained per Section 02112. Payment will constitute full compensation for all costs associated with tree protection fencing, including installation, maintenance, repair, and removal.
- H. Rip Rap - Bid Item 2-N-1410: Measurement for payment will be per square yard (SY) for rip-rap suitably installed and maintained. Payment will constitute full compensation for all costs associated with installation of all riprap, including filter fabric underlayment, shown on the Drawings, specified in Section 02273 at a minimum 18 inch depth, or directed by the Engineer. When crossing a stream or ditch, the quantity eligible for payment shall be limited to 10 feet upstream and 10 feet downstream of top of trench excavation and from five feet from top of bank, across a creek or ditch, banks and bottoms, to five feet beyond top of bank. Any other areas at creeks or ditches disturbed by the Contractor, which require Rip Rap, shall be rip rapped at no additional cost to the City.
- I. Erosion Control Items: No payment will be made for any portion of the Project for which temporary erosion and sedimentation controls are not properly maintained. Quantities for payment shall be based upon actual quantity constructed and authorized by the Engineer. Erosion and sedimentation control measures shall comply with the requirements of Sections 02125 and 02270 of these Specifications; the Georgia Erosion and Sedimentation Act of 1975, as amended; the Manual for Erosion and Sediment Control of Georgia, latest edition; local soil erosion and sedimentation control ordinances; and the Contract Drawings.

1. Construction Exits (Co) - Bid Item 2-S-1010: Measurement for payment will be per each (EA) for construction exits suitably installed and maintained per the Manual for Erosion and Sediment Control of Georgia, latest edition. Payment will constitute full compensation for all costs associated with construction exits, including installation, maintenance, repair, and removal. Note: Construction exits are required to conform to the specific dimensions in the Manual for Erosion and Sediment Control of Georgia, latest edition. Construction exits installed to lesser dimension than those required shall be paid on a pro-rated basis accordingly.
  2. Sediment Barrier (Silt Fence – Type C) - Bid Item 2-S-1225: Measurement for payment will be per linear foot (LF) for Type C silt fence suitably installed and maintained per the Manual for Erosion and Sediment Control of Georgia, latest edition. Payment will constitute full compensation for all costs associated with silt fence, including installation, maintenance, repair, and removal.
  3. Inlet Sediment Trap (Sd2)- Bid Item 2-S-1240: Measurement for payment will be per each (EA) for inlet sediment traps suitably installed and maintained per the Manual for Erosion and Sediment Control of Georgia, latest edition. Payment will constitute full compensation for all costs associated with inlet sediment traps at existing storm water inlet structures, including installation, maintenance, repair, and removal. Contractor shall be responsible for installing the number of sedimentation traps to adequately capture silt, thus minimizing silt leaving construction sites
- J. Flowable Fill - Bid Item 2-X-1410: Measurement for payment will be per cubic yard (CY) complete in-place and accepted. Payment will constitute full compensation for furnishing and installing controlled low strength flowable fill concrete in accordance with Specification Section 03300 – Concrete Work, including labor, materials, equipment and any miscellaneous formwork (if required).
- K. Concrete Encasement (if required) - Bid Item 2-X-2420: Measurement for payment will be per cubic yard (CY) complete in-place, tested and accepted. Payment will constitute full compensation for furnishing and installing concrete encasement in accordance with the Drawings and Specification Sections 02730 and 03300, including labor, equipment, materials and any miscellaneous formwork (if required). Payment for all soils and concrete testing shall be made separately by the City.

## 2.03 SEWER COLLECTIONS

- A. Sewer Collections, PVC Gravity Pipe (Replace), 8" to 16" Diameter, All Depth Categories; Open Cut - Bid Items 4-A-2108, 4-A-2208, and 4-A-2212: Measurement for payment will be per linear foot (LF) of pipe for gravity sewer replacement open cut measured from inside face of manhole to inside face of manhole. Depth of cut shall be the average depth of the pipeline as measured from the pipe invert to the existing ground level at the upstream and downstream manhole. Payment will constitute full compensation for all costs including but not limited to all labor, equipment, transportation, tools, dewatering, bypass pumping, pavement saw-cutting, excavation, removal and disposal of excavated material if replaced with imported material per Section 02200, existing pipe removal and disposal (size and material may vary), pipe bedding and haunching, pipe to manhole connections, pipe cutting, rebuilding existing manhole inverts and pipe beveling as required for a complete installation of new piping in accordance with Section 02730. No additional payment will be made for replacement of defective materials. No separate payment will be made for cutting or beveling pipe. All associated costs for air testing, post-installation cleaning (if required), and post-installation CCTV inspection for quality control shall be included under this item. Payment may be withheld due to failure to submit all post-installation CCTV video and other required quality control documentation for the work. No separate payment shall be made for survey work performed by or for the Contractor in the establishment of reference points, bench marks, cut sheets, limits of rights-of-way or easement, including their restoration, as well as centerline or baseline points. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Traffic control measures required for work in high-traffic/commercial areas will be paid when authorized by the Engineer (see Paragraph 2.01(C) above).
- B. Sewer Collections, RCP Gravity Pipe (Replace), 3" Diameter, All Depth Categories; Open Cut - Bid Items 4-A-1236, 4-A-1336, 4-A-1436, and 4-A-A1536: Measurement for payment will be per linear foot (LF) of pipe for gravity sewer replacement open cut measured from inside face of manhole to inside face of manhole. Depth of cut shall be the average depth of the pipeline as measured from the pipe invert to the existing ground level at the upstream and downstream manhole. Payment will constitute full compensation for all costs including but not limited to all labor, equipment, transportation, tools, dewatering, bypass pumping, pavement saw-cutting, excavation, removal and disposal of excavated material if replaced with imported material per Section 02200, existing pipe removal and disposal (size and material may vary), pipe bedding and haunching, pipe to manhole connections, pipe cutting, rebuilding existing manhole inverts and pipe beveling as required for a complete installation of new piping in accordance with Section 02730. No additional payment will be made for replacement of defective materials. No separate payment will be made for cutting or

beveling pipe. All associated costs for air testing, post-installation cleaning (if required), and post-installation CCTV inspection for quality control shall be included under this item. Payment may be withheld due to failure to submit all post-installation CCTV video and other required quality control documentation for the work. No separate payment shall be made for survey work performed by or for the Contractor in the establishment of reference points, bench marks, cut sheets, limits of rights-of-way or easement, including their restoration, as well as centerline or baseline points. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Traffic control measures required for work in high-traffic/commercial areas will be paid when authorized by the Engineer (see Paragraph 2.01(C) above).

- C. Add/Deduct Cost for Providing 36" DIP in lieu of RCP Pipe - Bid Items 4-A-5566: Measurement for payment will be per linear foot (LF). Payment will constitute full compensation for the additional/reduced (whichever applies) material and labor cost for furnishing and handling ductile iron pipe (DIP) instead of PVC pipe for open cut replacement, when directed to do so by the Engineer. All associated costs for pipe installation, equipment, air testing, material testing, post-installation cleaning (if required), post-installation CCTV inspection for quality control, post-installation infiltration testing, and related procedures and materials necessary shall be included in Open Cut bid items and not included herein. No additional payment will be made for replacement of defective materials.
- D. Sewer Manholes, 48" Diameter, 0' to 10' Depth, Pre-Cast Concrete – Bid Item 4-B-1048: Measurement for payment will be per each (EA). Payment will constitute full compensation for all costs for installing new pre-cast concrete manholes complete in accordance with Section 02491 and Section 02730. The unit price bid shall include but not be limited to excavation, manhole bedding, base, riser section(s), cone, anti-flotation measures (if required), chimney, frame, cover, steps, sealant, flexible piping connections, invert, bench(s), trough, connecting the pipes to the manhole, backfill and manhole vacuum testing. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Traffic control measures required for work in high-traffic/commercial areas will be paid when authorized by the Engineer (see Paragraph 2.01(C) above).
- E. Sewer Manholes, 72" Diameter, 0' to 10' Depth, Pre-Cast Concrete – Bid Item 4-B-1148: Measurement for payment will be per each (EA). Payment will constitute full compensation for all costs for installing new pre-cast concrete manholes complete in accordance with Section 02491 and Section 02730. The unit price bid shall include but not be limited to excavation, manhole bedding, base, riser section(s), cone, anti-flotation measures (if required), chimney, frame, cover, steps, sealant, flexible



piping connections, invert, bench(s), trough, connecting the pipes to the manhole, backfill and manhole vacuum testing. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Traffic control measures required for work in high-traffic/commercial areas will be paid when authorized by the Engineer (see Paragraph 2.01(C) above).

- F. Sewer Manholes, 96" Diameter, Pre-Cast Concrete – Bid Item 4-B-1648: Measurement for payment will be per each (EA). Payment will constitute full compensation for all costs for installing new pre-cast concrete manholes complete in accordance with Section 02491 and Section 02730. The unit price bid shall include but not be limited to excavation, manhole bedding, base, riser section(s), cone, anti-flotation measures (if required), chimney, frame, cover, steps, sealant, flexible piping connections, invert, bench(s), trough, connecting the pipes to the manhole, backfill and manhole vacuum testing. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Traffic control measures required for work in high-traffic/commercial areas will be paid when authorized by the Engineer (see Paragraph 2.01(C) above).

## **2.04 SEWER COLLECTIONS – LATERALS AND CLEANOUTS**

- A. Service Lateral Replacement 4"-6" Diameter, Various Depth Categories - Bid Items 4-C-1026: Measurement for payment will be per each (EA) service lateral replaced. Payment will constitute full compensation to remove, replace and reconnect the existing sewer lateral piping from the sewer main to the right-of-way or easement property boundary in conjunction with sewer main lining, internal point repair OR independent of any sewer main rehabilitation. Each service lateral replacement shall include, but not be limited to excavation, shoring, dewatering, pavement saw-cutting, removal and disposal of excavated material if replaced with imported material per Section 02200, piping and piping products for a complete installation (i.e. sewer main coupling(s), sleeve(s), sewer main tee fitting, wye fitting or saddle the mainline, lateral piping, lateral pipe fittings and lateral connection coupling) at no additional cost. All related costs for testing, post-installation cleaning (if required), and post-installation CCTV inspection for quality control shall be included under this item. Payment may be withheld due to failure to submit all post-installation CCTV video and other required quality control documentation for the work. No separate or additional payment will be provided in the event the City directs the contractor to install ductile iron piping or fittings for the service pipe reconnection. The lateral replacement depth shall be considered the same as the average sewer main depth for measurement and payment purposes regardless of the actual excavation depth required. The average sewer main pipeline depth shall be as measured from the pipe invert to the existing ground level at the upstream and downstream manhole. Separate

payment will be made for surface restoration and installation of a new clean-out in conjunction with each service lateral replacement.

- B. Sewer, Cleanout, Install at ROW on Private Service - Bid Item 4-C-3010: Measurement for payment will be per each (EA). Payment will constitute full compensation to install a two-way cleanout at the edge of right-of-way or easement boundary complete (including riser piping, cleanout box and/or accessories, cleaning (if necessary), testing and restore the service laterals operation in accordance with Sections 02730, 02735 and Drawing Details. The cleanout shall incorporate all appropriate and necessary couplings to both the service connection and house connection. A cleanout shall be installed in conjunction with ALL service lateral replacements to edge of right-of-way.

## **2.05 SEWER COLLECTIONS – INTERNAL PIPE INSPECTION AND CLEANING**

- A. Sewer, Internal Pipe Inspection, All Diameters - Bid Item 4-I-1050 and 4-I-1150: Measurement for payment will be per linear foot (LF) from center of manhole to center of manhole. Payment will constitute full compensation to perform an internal closed circuit television (CCTV) sewer pipe inspection on sewers to be rehabilitated or replaced. No defect coding is required; however, header data and coding of service lateral locations is required. There will be no separate payment made for data delivery. Costs shall include, but not be limited to, labor, equipment, transportation, setup, tools, and all other related procedures and materials necessary to complete the inspections in accordance with Section 02752 – Internal Sewer Condition Assessment. This item DOES NOT include post CCTV quality control inspection for sewer rehabilitation and replacement work. The cost for post CCTV quality control inspection for sewer rehabilitation and replacement work is to be included in the price of the respective sewer rehabilitation or replacement bid item. Payment shall only be made for the footage of sewer that is inspected commencing with zero footage at the portal of the pipeline associated with the manhole. If a pipe must be repaired before inspection can continue, then that repair will be paid for under the appropriate point repair bid items. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Traffic control measures required for work in high-traffic/commercial areas will be paid when authorized by the Engineer (see Paragraph 2.01(C) above).
- B. Sewer, Internal Pipe Inspection, Service Lateral, 4” to 6” Diameter - Bid Item 4-I-6010: Measurement for payment will be per linear foot (LF). Payment will constitute full compensation for inspection of service laterals, including, but not limited to, hand held (“Push Camera”) CCTV inspection, labor, other equipment, transportation setup, tools, and all other related procedures and materials necessary to complete the inspection in accordance with Section 02752 – Internal Sewer Condition Assessment. The Contractor shall perform service lateral television inspection on all

service laterals exposed for open cut replacement, point repairs, HDD, or pipebursting/pushbursting, and/or when directed to do so by the Engineer. This item does not include post-construction CCTV quality control inspection for service lateral rehabilitation or repair work. The cost for post CCTV quality control inspection for service lateral rehabilitation and repair work is to be included in the price of the respective service lateral rehabilitation or replacement bid item and will not be paid for separately. Payment shall only be made for the footage of service lateral that is inspected (when directed by the Engineer) commencing with zero footage at the portal of the pipeline associated with the mainline or at the clean-out. If a defective service lateral must be repaired before inspection can continue, then that service lateral will be replaced from the mainline to the property line, to be paid for separately under lateral reconnection or replacement bid items.

- C. Sewer, SSES, Smoke Testing – Bid Item 4-K-1030: Measurement for payment will be per linear foot (LF) from center of manhole to center of manhole. Payment will constitute full compensation for smoke testing of sewers, including but not limited to labor, equipment, transportation, tools and all other related procedures and materials necessary to produce the results in the form, format and of the quality specified in Section 01532E – Smoke Testing. This item of Work shall be performed solely at the direction of the Engineer. Payment shall be made for the length (LF) of sewer smoked, measured.
- D. Sewer, SSES, Dye Testing, CCTV & Observation – Bid Item 4-K-2040: Measurement for payment will be per each (EA). Payment will constitute full compensation for dye testing and CCTV “pull through” inspection, including, but not limited to, labor, equipment, transportation, tools and all other related procedures and materials necessary to provide the test data in the form, format and of the quality specified in Sections 01532F – Dye Testing and Section 02752 – Internal Sewer Condition Assessment. The Contractor shall provide 2 laborers (minimum) for the CCTV camera, as well as 1 additional laborer (minimum) for the required duration. This item of Work shall be performed solely at the direction of the Engineer. Payment shall be made for each connectivity verification performed.

## **2.06 SEWER COLLECTIONS – JACK & BORE**

- A. Sewer, Replacement with HDPE or DIP Using Jack & Bore Method, All Depths (All Diameters) – Bid Items 4-T-5412: Measurement for payment for jack and bore or tunnel installations will be on a per linear foot (LF) basis for each location for boring and jacking a steel casing and installing the pipeline therein or constructing a tunnel and installing the pipeline therein at the location and between the limits as shown and detailed on the Drawings and as specified herein and accepted by the Engineer.

- B. Payment of the unit price established in the Bid Schedule for each jack and bore or tunnel installation will be full compensation for all labor, materials, equipment and incidentals required to complete the installation between the limits as shown and detailed on the Drawings.
- C. Payment of the unit price established in the Bid Schedule shall include all costs to complete the installation by either method.
- A. Payment of the unit price established in the Bid Schedule for each installation shall include furnishing and installing the steel casing pipe including spacers, or excavation and tunnel construction and all additional work and materials required for the completion of the crossings including furnishing and installing carrier pipe inside the casing or tunnel, annular fill, casing or tunnel end plugs, surface settlement monitoring, all excavation (including rock excavation), sheeting and bracing, dewatering and drainage, cleaning and testing of the pipe, backfill, cleaning the site, sodding and seeding as applicable, and for all else incidental thereto for which separate payment is not provided under other items in the Bid Schedule.
- B. Payment shall fully reimburse the Contractor for cooperating with and meeting all the requirements of the Georgia Department of Transportation and the affected railroads relative to construction as may be required or necessary to complete the crossings.
- C. Payment shall also be full compensation for excavation, backfill and compaction of jacking and receiving shafts and all steel sheeting left in place for the installation as specified.

## **2.07 SEWER COLLECTIONS - ABANDONMENT/CAP & PLUG/REMOVAL**

- A. Sewer, Abandon (grout fill) Existing Sewer Line in Place, All Diameters - Bid Item 4-X-1018, 4-X-1024, and 4-X-1036: Measurement for payment will be per linear foot (LF). Payment will constitute full compensation for existing sewer abandonment by grout filling the existing sewer line in place. Measurement shall be based on the volume of grout installed compared with calculated volume of pipeline as directed by the Engineer. The unit price bid shall include, but not be limited to all costs for material, labor, equipment, bulkheads, vent piping and other miscellaneous items as required for a complete installation. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Traffic control measures required for work in high-traffic/commercial areas will be paid when authorized by the Engineer (see Paragraph 2.01(C) above).
- B. Sewer, Cut & Plug Existing Sewer Line (All Diameters) – Bid Items 4-X-2018, 4-X-2024, and 4-X-2036: Contractor will be paid for cutting and/or plugging the existing sewer line in place. The plug shall not extend more

than 2 ft into the pipe being abandoned. Measurement shall be based on the number of sealed ends properly constructed to facilitate the grout filling of abandoned pipes. Payment shall be made at the unit price for each pipe end acceptably sealed with grout or mortar, including brick, concrete or other block inserts used to back the mortar plug. Provision of an air relief tube necessary to allow grout filling of the abandoned pipe and sealing the air relief tube after grouting shall be included in the price. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Additional traffic control measures required for work in high-traffic/commercial areas will be paid for separately when authorized by the Engineer (see Paragraph 2.01(D) above).

- C. Remove & Dispose of Existing Manhole, 0-10' Depth, All Sizes - Bid Item 4-X-4010: Demolition of manholes will be paid for each existing manhole demolished up to 10 feet deep, all manhole sizes. Payment will include all costs associated with excavation, removal of existing structure, compacted backfill, and proper disposal of manhole materials. Abandonment of connecting pipe(s) (if required) and flow control/bypass pumping will be paid for as separate items. Measurement for payment shall be made from the top of the manhole frame and cover to the invert at the outgoing pipe (VF). Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Additional traffic control measures required for work in high-traffic/commercial areas will be paid for separately when authorized by the Engineer (see Paragraph 2.01(D) above). Payment for soils testing will be made separately by the City.
- D. Remove & Dispose of Existing Manhole, >10' Depth, All Sizes - Bid Item 4-X-4020: Demolition of manholes will be measured per vertical foot of existing manhole demolished beyond the initial 10 VF depth included in Item 4-X-4010, all manhole sizes. Payment will include all costs associated with excavation, removal of existing structure, compacted backfill, and proper disposal of manhole materials for the additional manhole depth. Measurement for payment shall be made from the top of the manhole frame and cover to the invert at the outgoing pipe (VF). Payment for soils testing will be made separately by the City.
- E. Abandon & Fill Existing Manhole, 0-10' Depth, All Sizes - Bid Item 4-X-4030: Abandonment of existing manholes will be paid for each existing manhole abandoned up to 10 feet deep, all manhole sizes. Payment will include all costs associated with the excavation, removal and disposal of the top of each manhole to a depth of 5 feet below grade, plugging of all pipe penetrations, filling remaining structure with flowable fill concrete grout, compacted backfill, and proper disposal of contaminated excavation materials. Measurement for payment shall be made from the top of the manhole frame and cover to the invert at the outgoing pipe (VF). Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Additional traffic control measures required for work in high-

traffic/commercial areas will be paid for separately when authorized by the Engineer (see Paragraph 2.01(D) above). Payment for soils testing will be made separately by the City.

- F. Abandon & Fill Existing Manhole, >10' Depth, All Sizes - Bid Item 4-X-4040: Abandonment of existing manholes will be measured per vertical foot of existing manhole abandoned beyond the initial 10 VF depth included in Item 4-X-4030, all manhole sizes. Payment will include all costs associated with the concrete grout fill of the additional manhole depth. Measurement for payment shall be made from the top of the manhole frame and cover to the invert at the outgoing pipe (VF). Payment for soils testing will be made separately by the City.

## 2.08 RESTORATION

- A. Asphalt Pavement Patch – Sewer Trench Section - Bid Item 6-A-1410: Measurement for payment will be per square yard (SY) of pavement removed and replaced. Payment will constitute full compensation for removal and disposal of existing pavement and placement of new pavement including restoration of existing pavement markings as required for pipeline trench work, pits and service lateral excavations in streets not to exceed the paving limits indicated on Detail G-7 Type III Pavement Replacement in Section 02575. The unit price shall include, but not be limited to, labor, equipment, materials, transportation, and tools required to perform the work in accordance with the Drawings and Specifications. No additional payment will be made for removing and replacing adjacent pavement damaged in performance of the sewer rehabilitation and replacement work. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Traffic control measures required for work in high-traffic/commercial areas will be paid when authorized by the Engineer (see Paragraph 2.01(C) above). Payment for soils testing and concrete shall be made separately by the City.
- B. Concrete Pavement Patch – Open Cut Work in GDOT Roads, GDOT Standard 1401 – Bid Item 6-B-5410: Measurement for payment will be per square yard (SY) of concrete pavement removed and replaced. Payment will constitute full compensation for removal and disposal of existing concrete pavement, excavation, backfill, and placement of new Class “A” concrete pavement (including high early strength mixture with additives if required) and restoration of existing pavement markings as required for utility excavations in State roads. The unit price shall include, but not be limited to, labor, equipment, materials, transportation, and tools required to perform the work in accordance with the Georgia Department of Transportation (GDOT) Standard Pavement Patching Details (number 1401). [Note: A copy of the Standard Details is available online at

<http://www.dot.state.ga.us/> ]. Traffic control measures required for work in high-traffic/commercial areas will be paid for separately (see Paragraph 2.01(C) above). Payment for soils testing and concrete shall be made separately by the City. No additional payment will be made for removing and replacing adjacent pavement damaged in performance of the sewer rehabilitation and replacement work.

- C. Concrete and Granite, Curb and Gutter - Bid Item 6-E-2410: Measurement for payment will be per linear foot (LF) of curb removed and replaced. Payment will constitute full compensation for removing and replacing existing curb and gutter as necessary to complete the sewer rehabilitation or replacement work. Replacement of granite curbs and gutters shall be installed in accordance with the Drawing Detail 15/GC-2 and Section 02532 for Concrete Curbs and Gutters. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Traffic control measures required for work in high-traffic/commercial areas will be paid when authorized by the Engineer (see Paragraph 2.01(C) above).
- D. Concrete Sidewalk - Bid Item 6-F-3410: Measurement for payment will be per square yard (SY) of concrete sidewalk removed and replaced. Payment will constitute full compensation for removing and replacing a public or private sidewalk in accordance with the Drawings and Section 02530 – Concrete Walks. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Traffic control measures required for work in high-traffic/commercial areas will be paid when authorized by the Engineer (see Paragraph 2.01(C) above).
- E. Asphalt or Cementitious Concrete Driveway Replacement - Bid Item 6-F-3440: Measurement for payment will be per square yard (SY) of driveway removed and replaced. Payment will constitute full compensation for removal and replacement of asphalt or concrete driveways. Replaced driveways shall be installed in accordance with the Drawings and Specifications. Traffic control measures for work in low-traffic/residential areas shall be included in the unit price. Additional traffic control measures required for work in high-traffic/commercial areas will be paid for separately when authorized by the Engineer (see Paragraph 2.01(C) above). Payment for all soils and concrete testing shall be made separately by the City.
- F. Tree Restoration (Any Type Except Pine) - Bid Item 6-T-1015: Measurement for payment will be per each (EA). Payment will constitute full compensation for removing and replacing trees conflicting with the replacement or rehabilitation work on the sewer, whether on public or private property. Replacement may include removal and replanting, or replacing with a new tree (as directed by the Engineer), provision of tree survey, arborist support and arborist tree removal permit in accordance with Section 02112 –Route Clearing and Section 02900- Landscaping.

- G. Seeding – Bid Item 6-U-2450: Measurement for payment will be per square yard (SY). Payment will constitute full compensation for fine grading, fertilizing and seeding previously landscaped areas on public or private property in accordance with Section 02900 – Landscaping. Grass seeding shall match in kind the existing adjacent grass of previously landscaped areas. Soil preparation and/or topsoil shall be included.
- H. Sodding – Bid Item 6-U-3410: Measurement for payment will be per square yard (SY). Payment will constitute full compensation for fine grading, fertilizing and sodding previously landscaped areas on public or private property in accordance with Section 02900 – Landscaping. Disturbed areas shall be sodded only when directed to do so by the Engineer.

## 2.08 ALLOWANCES

- A. Allowances specified in the Bid Schedule are to establish a fund to pay the cost of items for which the City could not establish accurate quantities and/or detailed scope of work. This work shall be completed only at the written direction of the Engineer, and the cost of such work shall be approved prior to performance of the work.
- B. The Contractor shall be responsible for the payment for these services to the appropriate payee providing such service, and shall submit evidence of payments to the Engineer prior to its inclusion in the progress payments.
- C. Payment will be made for invoices submitted by the Contractor subject to the Contract Documents. Contractor will not receive any additional compensation for bond or insurance costs for work executed using allowance funding.
- D. Allowance allocations shall only be paid to the Contractor for completed work authorized by the Engineer. All allowance dollar amounts not expended shall revert to the City at the completion of the project. Should the final allowance costs be less than the specified amount of the allowance the Contract will be adjusted accordingly by change order. The amount of change order will not recognize any changes in handling costs at the site, labor, overhead, profit and other expenses caused by the adjustment to the allowance item.
- E. Allowances have been included in the contract in accordance with Section 01380 for the following:
  - 1. Owner Controlled Contingency – Bid Item 9-Z-2410: An allowance has been established as the value of this item. This allowance shall be used to pay for miscellaneous work to be accomplished at the



direction of the Engineer. It shall include items of work consistent with and related to the project which are not shown on the plans but which may be necessary to the successful completion of the Agreement. It is expected that work under this item will be accomplished utilizing construction items established under the other sections of these specifications. All work performed under this section shall comply with the various sections of these specifications which are appropriate to the specific items involved. No work will be allowed under this section without the prior written approval of the Engineer. . This work shall be further described, by the Engineer, in written form and/or on modifications to the drawings or on supplemental drawings. This allowance may be used to pay the costs, where the amounts are determined as specified in General Condition Article GC-42, and as directed by the Engineer.

2. Material Testing – Bid Item 9-Z-2480: An allowance has been established as the value of this item. This allowance provides for soil, concrete, asphalt and other testing services which verify the required quality and/or workmanship of the Work as required by the Engineer or Specifications. Refer to Sections 01380 and 01410 for testing requirements. This allowance may be used to pay the costs, where the amounts are determined as specified in General Condition Article GC-42, and as directed by the Engineer.
3. City Directed Site Restoration (Private & City Properties) – Bid Item 9-Z-4450: An allowance has been established as the value of this item. This allowance is provided for site restoration work on private property outside the scope of the bid items. Site restoration shall only be performed where private property has been damaged during the course of the work, not due to contractor negligence.
4. City Directed Additional Work – Bid Item 9-Z-4460: An allowance has been established as the value of this item. This allowance is provided for related sewer utility work to be performed in conjunction with this project at the direction of the City. All work performed under this section shall comply with the various sections of these specifications and industry standards which are appropriate to the specific items involved. This work shall be further described, by the Engineer, in written form and/or on modifications to the drawings or on supplemental drawings. In any event, no work will be allowed under this section without the prior written approval by the City.

### **PART 3 – PRODUCTS (NOT USED)**

### **PART 4 – EXECUTION (NOT USED)**

**END OF SECTION**

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**SECTION 01310****Scheduling the Work****PART 1 – GENERAL****1.01 SCOPE**

- A. This section describes the scheduling and progress reporting requirements of the Contract. The primary objectives of the requirements of this Section are:
1. To assist the City and Engineer in evaluating the progress of the Work;
  2. To provide for optimum coordination and sequencing of the Work by the City, Contractor and any related work or services provided by other parties which may affect the Project.
  3. To permit the timely prediction or detection of events or occurrences that might affect the timely prosecution of the Work.
- B. The Contractor shall be required to attend a 1-day training/mentoring session on the use of the Primavera scheduler software, provided by a Primavera Authorized Trainer. The Contractor shall provide the training session (fee for the Primavera Authorized Trainer) and Primavera training manuals for each participant as needed. The training session shall be held at the Evans Technology, Roswell, Georgia facility and shall be attended by the Contractor's scheduler(s). The Contractor shall be responsible for the cost of training for additional members of their firm or future retraining, as may be deemed necessary by the Contractor.

**1.02 GENERAL SCHEDULING REQUIREMENTS**

- A. The Work of this Contract shall be planned, scheduled, executed, and reported using the critical path method (CPM). Through the Project Control Tools bid item, the Contractor shall purchase and use the following software program to develop its Schedule Submittal:
1. Primavera Engineering and Construction, version to be specified by the Engineer
- B. A comprehensive schedule shall be developed by the Contractor and submitted to the Engineer for review prior to commencement of said Work. Upon acceptance by the Engineer, the schedule will be merged into the City's overall schedule.

- C. The schedule shall be structured on an asset basis (manholes and sewers). The asset identification (ID) numbers are assigned by the City of Atlanta through its geographic information system (GIS). There may be numerous work activities for each asset, depending on the Contractor's choice for work break down, however, each activity must include standard attributes or associated codes as defined in the table below. Separate fields or attributes shall be provided for each activity as illustrated below to enable the City and Engineer to coordinate with the community and others by use of a centralized planning/ scheduling system.

**Activity Codes:**

Required	Activity Code	Example	
		Code Value	Description
X	* Area Management District (T13 Global)	North	North Area:
X	Asset Location (T13 Global)	Easement	Asset requires Easement for Access
X	* Contract Number (T13 Global)	3006007989	FC-3006007989 Sewer Group 1 - Rehabilitation - Pipe Bursting Phase 2 Contract A1
X	Contractor (T13 Global)	IWPC	Inland Waters Pollution Control
X	* Council District (Global)	1	Council District 1
X	House Number (T13 Global)	82	82
X	* Neighborhood Planning Unit (Global)	C	NPU C
X	Permit (T13 Global)	1	Utility Permit - Lane Closure
X	Pipe Diameter (T13 Global)	12	Pipe Diameter: 12-inches
X	Priority (Global)	Y	Yes
X	Rehabilitation Method (T13 Global)	REP	Open Cut Replacement
X	* Sewer Basin (GLOBAL)	South River	South River Basin
X	Street Name (T13 Global)	Aaron Street NW	Aaron Street, NW
X	Structure: From Location (T13 Global)	13850200701	Sewer Group 1 \ Sewershed: UT01BX
X	Structure: To Location (T13 Global)	13850200701	Sewer Group 1 \ Sewershed: UT01BX
	Structure: TEMP. MH From Location (T13)		
	Structure: TEMP. MH To Location (T13)		
X	* WBS AC Lvl 01 (T13)	04	Rehabilitate Sewer System
X	* WBS AC Lvl 02 (T13)	04.16	Sewer Group 1
X	* WBS AC Lvl 03 (T13)	04.16.212	Sewer Group 1 - Rehabilitation - Phase 2 - Pipe Bursting \ Contract A1
X	* WBS AC Lvl 04 (T13)	70	Construction
X	* WBS AC Lvl 05 (T13)	70	Construction

\* = Do Not Modify these activity codes values, or descriptions.

- D. At a minimum, the schedule shall include the activities for each rehabilitated asset (sewer pipeline or manhole) as deemed appropriate to clearly illustrate and document the Work. The activities listed below are repetitive for the same type of rehabilitation when organized on an asset basis and generally considered standard industry practice. This set of

standard activities will be used to harmonize multiple rehabilitation contracts by the City and shall not be revised or in text or grouping without approval from the Engineer.

### Planning & Administrative Activities by Contract Type:

Description	Contract Type
Bond & Insurance Submittal	ALL
Product Submittals	ALL
Permits	ALL
Right of Entry Acquisition	REHAB
72 Hour Disruption Notice	REHAB
Door Hanger Notification	REHAB
Application for Payment Submission	ALL
Application for Payment Review	ALL
Project Record Submittals	ALL
Project Closeout Document Submittals	ALL

### Construction Activities by Rehabilitation Type:

Description	Rehab Type
Pre-Construction Survey	ALL
Locate Existing Utilities	PB, Open Cut, HDD
Install Access Road	ALL
Install/ Maintain/ Remove Traffic Control	ALL
Install/ Maintain/ Remove Bypass Pumping	ALL
Pre-CCTV Existing Pipeline	CIPP, HDD, PB
Rehabilitate Service Laterals	CIPP, PB, HDD, Open Cut
Precondition Existing Pipeline	CIPP
Install Liner/ Reinstate Services	CIPP
Install Launch Pit/ PB / Reinstate Services	PB
Install New Pipeline/ Reinstate Services	Open Cut, HDD
Post CCTV Review	CIPP, PB
Post CCTV Submission to COA	CIPP, PB
Manhole Rehabilitation	MH
Test New Installation	ALL
Site Restoration	ALL
Pavement Replacement	ALL
Asphalt Pavement Milling & Topping	PAVMT

**Milestones by Contract Type:**

Description	Contract Type
Contract Execution	ALL
Notice to Proceed	ALL
Pre-construction Meeting	ALL
(" ") Public Information Meeting	ALL
Trial Test Methodology Acceptance	ALL
Sewershed ( " ") Substantial Completion	ALL
Sewershed (" ") Final Completion	ALL
Contract Substantial Completion	ALL
Contract Final Completion	ALL

- E. The Contractor shall typically report progress by sewershed and rehabilitation method.
- F. The Schedule Submittal, as defined herein, shall represent the Contractor's commitment and intended plan for completion of the Work in compliance with the Contract completion date and interim milestone dates specified. The Schedule Submittal shall take into account all foreseeable activities to be accomplished by any separate consultants or the City, and interface dates with utility companies, the City's operations, and others. The Schedule Submittal shall anticipate all necessary manpower and resources to complete the Work within the dates set forth.
- G. Once reviewed and accepted by the Engineer, the Schedule Submittal will become the Schedule of Record.
- H. The Contractor is responsible for determining the sequence of activities, the time estimates of the detailed reconnaissance/investigative and rehabilitation activities, as well as the means, methods, techniques and procedures to be employed. The schedule shall clearly indicate the proposed sequence of work within each sewershed. The Schedule of Record shall represent the Contractor's best judgement of how it will execute the Work in compliance with the Contract requirements. The Contractor shall ensure that Schedule of Record is current and accurate and is properly and timely monitored, updated and revised as Project conditions and the Contract Documents may require.
- I. The City will work with the Contractor to assign and schedule the work in a logical and efficient manner. However, all items in this contract shall be priced such that each item can be assigned independently or combined at the City's sole discretion, in regards to both quantity and scope. There shall be no consideration of any claim for extra payment arising from a decision by the City to assign potential work items under this contract in any combination or in combination with another contract utilizing alternate technologies.

### 1.03 SCHEDULE SUBMITTALS

- A. The Contractor shall submit the qualifications of the scheduler(s) proposed to be used on the project immediately after NTP. The scheduler(s) is subject to the approval of the Engineer. The Contractor shall use the services of a scheduler(s) who has verifiable training and credentials in preparing and maintaining a computerized CPM Construction Schedule using Primavera software as specified herein. The qualifications of the scheduler(s) should be a minimum of 4 years experience in project scheduling for civil, structural, architectural, or related engineering disciplines. The scheduler(s) should have direct experience developing, maintaining, updating, modifying project schedules utilizing Primavera products, ideally Primavera Engineering and Construction. The cost for providing a qualified scheduler(s) shall be included in the Project Control Tools bid item.
- B. Within 30 days from receipt of Notice to Proceed, a baseline/ comprehensive schedule shall be submitted by the Contractor to the Engineer for approval. The Contractor shall submit the complete schedule in electronic format as directed by the Engineer. At a minimum, the schedule output shall include the following:
1. Activities with attributes or codes
  2. Estimated activity durations in working days. (Not to exceed 15 working days for the construction activities.)
  3. All logic ties
  4. The critical path activities differentiated from other activities
  5. All activities for submittal of shop and working drawings, videos, test results, procurement, fabrication, delivery, installation and testing of critical materials.
  6. Related activities shall be grouped on the network diagram
  7. A time scale located at the top and/or bottom of the network diagram showing calendar days and months
  8. Earliest start date
  9. Earliest finish date
  10. Actual start date
  11. Actual finish date
  12. Latest start date
  13. Latest finish date
  14. Calendar Definition
  15. Total float
  16. All constraints
  17. Lag – No lag is allowed in the baseline/ comprehensive schedule
  18. Monetary value of activity (from Schedule of Values)

- C. The Contractor shall participate in a review and evaluation of the baseline schedule with the Engineer. Any revisions necessary as a result of this review shall be resubmitted to the Engineer within 10 calendar days after the conference. The mutually acceptable schedule shall then be used by the Contractor for planning, organizing and directing the work and for reporting progress. If the Contractor desires to make changes in its method of performing the Work, he shall notify the Engineer in writing stating the reason for the changes.
- D. The Contractor shall demonstrate competence in the use of CPM scheduling through the submission of a fully compliant CPM Construction Schedule with the initial CPM submission. In the event the Contractor fails to provide a baseline schedule in a timely manner or fails to demonstrate competence in the CPM scheduling, the Engineer may direct the Contractor to employ the services of a Scheduling Firm that can demonstrate competence. The Contractor shall comply with such directive at no additional cost to the City.
- E. Each activity shall be coded using the following format:

xxxx.yyyyyy

Where xxxx is the last four digits of the contract number (FC #), and yyyyyy is for the Contractor's use according to a template provided by the Engineer at the pre-construction conference.

- F. Activities and milestones to appear on the Schedule Submittal shall include, but not be limited to, City reviews that impact the Work, negotiation for Rights of Entry, Easement delineation, obtaining required permits, sitework, paving, submittals, renewal/rehabilitation and testing by pipe segment, coordination requirements, and dates of Substantial and Final Completion.
- G. The Engineer shall have the right to require the Contractor to modify any portion of the Contractor's Schedule Submittal, or Recovery Schedule, as herein required, (including cost loading) with the Contractor bearing the expense thereof, which the Engineer reasonably determines to be:
  - 1. Impractical or unreasonable
  - 2. Based upon erroneous calculations or estimates
  - 3. Required to ensure proper coordination by the Contractor of the Work of its subconsultants and with the work or services being provided by any separate consultants
  - 4. Necessary to avoid undue interference with the City's operations
  - 5. Necessary to ensure completion of the Work by the milestone and completion dates set forth in the Contract Documents



- 6. Required in order for the Contractor to comply with the requirements of this Section or any other requirements of the Contract Documents
- 7. Not in accordance with the Contractor's actual operations
- H. The electronic version of the schedule shall be submitted on a floppy computer disk or CD-R, in a form and format acceptable to the Engineer, including all required submission information resident in the computer system and containing all of the files associated with the schedule.
- I. Each week the Contractor will provide the Engineer and Public Information (PI) Office with a detailed 2 week look-ahead schedule. The schedule must be in the format required by the PI Office.

#### **1.04 UPDATING OF THE SCHEDULE / PROGRESS REPORTS**

- A. The Engineer shall review the Contractor's report of actual progress at each progress meeting. Prepared by the Contractor, said report shall set forth up-to-date and accurate progress. The Contractor in consultation with all principal subconsultants shall prepare said report. The Contractor will perform a complete schedule update on a monthly basis or at the discretion of the Engineer.
  - 1. The Contractor shall submit the updated schedule in electronic format as directed by the Engineer. The Contractor shall submit hard copies of the schedule output including, but not limited to:
    - a. 30-day Look-ahead Report including but not limited to planned activities within the next thirty days
    - b. Milestones to be completed
  - 2. The Contractor shall provide written explanation of all changes in activity durations, relationships, and constraints with the schedule output. Changes will require written approval by the Engineer.
- B. The Schedule Report of the Contractor shall show the activities, or portions of activities, completed during the reporting period, the actual start and finish dates for these activities, remaining duration and estimated completion dates for activities currently in progress.
- C. At the progress meeting a total review of the Project will take place including but not limited to, the following:
  - 1. Current update of the Schedule of Record in format as prescribed by Engineer

2. Anticipated detailed construction activities for the subsequent report period
  3. Critical items pending
  4. Contractor requested changes to the Schedule of Record
- D. The Contractor shall submit a narrative with the progress report which shall include, but not be limited to, a narrative describing actual Work accomplished during the reporting period, a description of problem areas, current and anticipated delaying factors and their impact, explanations of corrective actions taken or planned, any proposed newly planned activities or changes in sequence, and proposed logic for a Recovery Schedule, if required, as further described herein.
- E. No invoice for payment shall be submitted and no payment whatsoever will be made to the Contractor until the Schedule of Record, and narrative reports as defined herein, are updated.

#### **1.05 SCHEDULE REVISIONS**

- A. Should the Contractor desire to or be otherwise required under the Contract Documents to make modifications or changes in its method of operation, its sequence of Work or the duration of the activities in the Schedule of Record, it shall do so in accordance with the requirements of this Specification Section and the Contract Documents. The approved Schedule of Record may only be revised by written approval of the Engineer as provided herein.
- B. The Contractor shall submit requests for revisions to the Schedule of Record to the Engineer using the Schedule Revision Form provided by the Engineer. The Contractor shall identify revisions and description of logic for rescheduling work and substantiate that the milestone and completion dates will be met as listed in the Contract Documents. Proposed revisions acceptable to the Engineer and City will be approved in writing and incorporated into the Schedule of Record.
- C. Requests for revision will be accompanied by evidence acceptable to the Engineer that the Contractor's subcontractors are in agreement with the proposed revisions.
- D. If there are separate consultants on the Project, the approval of the separate consultants shall be obtained to make the proposed schedule revisions. If accepted by the Engineer and City, the revisions shall be binding upon the Contractor and all separate consultants on the Project.

- E. The impact of all change orders to this Contract shall be included in the project schedule.

## **1.06 RECOVERY SCHEDULE**

- A. Should the updated Schedule of Record, at any time during the Contractor's performance show that, in the sole opinion of the Engineer, the Contractor is behind schedule for any milestone or completion date for any location or category of work, the Contractor, at the request of the Engineer, shall prepare a Schedule Revision for the purpose of displaying recovery. The revision shall identify how the Contractor intends to reschedule its Work in order to regain compliance with the Schedule of Record within thirty (30) calendar days.
- B. The Contractor shall prepare and submit to the Engineer a one month maximum duration Recovery Schedule, incorporating the best available information from subconsultants, subcontractors and others which will permit a return to the Schedule of Record at the earliest possible time. The Contractor shall prepare a Recovery Schedule to the same level of detail as the Schedule of Record. The Recovery Schedule shall be prepared in coordination with other separate consultants on the Project.
- C. Within two (2) calendar days after submission of the Recovery Schedule to the Engineer, the Contractor shall participate in a conference with the Engineer to review and evaluate the Recovery Schedule. Within two (2) calendar days of the conference, the Contractor shall submit the revisions necessitated by the review for the Engineer's review and acceptance. The Contractor shall use the accepted Recovery Schedule as its plan for returning to the Schedule of Record.
- D. The Contractor shall confer continuously with the Engineer to assess the effectiveness of the Recovery Schedule. As a result of these conferences, the Engineer will direct the Contractor as follows:
  - 1. If the Engineer determines the Contractor continues behind schedule, the Engineer will direct the Contractor to prepare a Schedule Revision and comply with all of the requirements of a Schedule Revision as stated herein and the other requirements of the Contract Documents; provided, however, that nothing herein shall limit in any way the rights and remedies of the City and Engineer as provided elsewhere in the Contract Documents; or
  - 2. If the Engineer determines the Contractor has successfully complied with provisions of the Recovery Schedule, the Engineer will direct the Contractor to return to the use of the approved Schedule of Record.

## 1.07 FLOAT TIME

- A. Float or slack time shown on the currently approved Schedule of Record is not for exclusive use or benefit of either the City or the Contractor and is available for use by either of them according to whichever first needs the benefit of the float to facilitate the effective use of available resources and to minimize the impact of Project problems, delays, impact, acceleration or changes in the Work which may arise during performance. The Contractor specifically agrees that float time may be used by the City in conjunction with their review activities or to resolve Project problems. The Contractor agrees that there will be no basis for any modification of the milestone or completion dates or an extension of the Contract Time, or a claim for additional compensation as a result of any Project problem, delay, impact, acceleration, or change order which only results in the loss of available float on the currently approved Schedule of Record. Unless otherwise stated herein, float as referenced in these documents, is total float. Total float is the period of time measured by the number of working days each non-critical path activity may be delayed before it and its succeeding activities become part of the critical path. If a non-critical path activity is delayed beyond its float period, that activity then becomes part of the critical path and controls the end date of the project. Thus, the delay of the non-critical path activity beyond its float period will cause delay to the project itself.
- B. Float time shown on the Schedule of Record shall not be used arbitrarily by the Contractor in a manner which, in the opinion of the Engineer, unnecessarily delays separate subcontractors from proceeding with their work in a way which is detrimental to the interests of the City. Liability for delay of the project completion date rests with the party actually causing delay to the project completion date. For example, if Party A uses some, but not all of the float time and Party B later uses the remainder of the float time as well as additional time beyond the float time, Party B shall be liable for the costs associated with the time that represents a delay to the project's completion date. Party A would not be responsible for any costs since it did not consume all of the float time and additional float time remained, therefore, the project's completion date was unaffected.

END OF SECTION

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**SECTION 01320**

**CONSTRUCTION PHOTOGRAPHY**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. The Contractor shall furnish all labor, equipment and materials required to provide the Owner with digital construction photography of the Project as specified herein.
- B. The Contractor shall provide for professional videos and photographs to be made prior to and after construction to provide documentation of conditions and aid in any damage claims assessment. All conditions which might later be subject to disagreement shall be shown in sufficient detail to provide a basis for decisions.
- C. Video and photo files shall become the property of the Owner and none of the video or photographs herein shall be published without express permission of the Owner.

**1.02 PRE AND POST CONSTRUCTION PHOTOGRAPHY**

- A. Prior to the beginning of any work, the Contractor shall provide for professional videos and photographs of the work area to record existing conditions.
  - 1. The Contractor shall furnish a complete videotaped record of the pipeline route. The videotape shall include the date of taping and shall contain audio commentary to emphasize existing conditions along the entire route.
  - 2. The route shall be videotaped prior to beginning of construction. The Contractor shall furnish three sets of compact disks containing the videotaped data to the Engineer.
  - 3. The route shall also be videotaped at the completion of construction when directed by the Engineer. The videotape shall show the same areas and features as in the preconstruction videos. The Contractor shall furnish three sets of compact discs containing the videotaped data to the Engineer.
- B. The pre-construction videos shall be submitted to the Engineer within 15 calendar days after receipt of construction Notice to Proceed by the Contractor. Post construction videos and photographs shall be provided prior to final acceptance of the project.

**1.03 PROGRESS PHOTOGRAPHS**

- A. Photographs shall be taken to record the general progress of the Project during each pay period. Photographs shall be representative of the primary work being performed at the time.
- B. All photographs shall be taken with a digital camera. The photographs shall include the date and time marking in the digital record. All photographs shall be labeled on a tab connected to the bottom of the photo to indicate date and description of work shown.

**PART 2 PRODUCTS****2.01 PHOTOGRAPHS**

- A. Photography and video files shall be provided in CD-ROM format.
- B. Photographs shall also be provided in hard copy format. The photographs shall include the date and time marking on the photograph. All photographs shall be labeled on a tab connected to the bottom of the photograph. Tab label shall contain:
  - 1. Project name.
  - 2. Orientation of view.
  - 3. Description of work shown.
- C. All compact disks (CDs) furnished under this section shall be suitable for viewing with Windows Media Player.

**PART 3 EXECUTION****3.01 SUBMITTALS**

- A. No construction shall start until pre-construction photography has been completed and accepted by the Engineer.
- B. A minimum of ten 8 x10-inch progress photographs shall be submitted with each application for payment. The view selection will be as determined by the Engineer. Photographs shall be submitted in Print File Archival Preservers, 8 1/2 x 11-inch plastic sleeves pre-punched for a 3-ring binder.
- C. Construction photographs shall be submitted with each payment request. Failure to include photographs may be cause for rejection of the payment request.

- D. The Contractor shall be responsible for all discrepancies not documented in the pre-construction videos and photography.

**+ + + END OF SECTION 01320 + + +**

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**SECTION 01350****Project Document Tracking and Control System****PART 1 – GENERAL****1.01 SCOPE**

- A. The Contractor shall utilize the City of Atlanta's Project Document Tracking and Control System (DTCS). The primary function of the system is to facilitate timely processing and approval of all contract documentation in coordination with the overall Project Schedule established by these Specifications and the Contractor. The City will identify the specific system to be utilized for document tracking and control and Lynx Photo Management software. The DTCS will:
1. Facilitate communication among the Owner, Engineer and Contractor;
  2. Facilitate turn-around time with regard to responses and approvals;
  3. Provide a central location for all Project information to facilitate all Project participants in performing their tasks based on the latest Project data;
  4. Provide a standard system of project administration with accountability.
- B. The Contractor shall be required to utilize the web-based DTCS system that resides on the Department of Watershed Management server to generate documents in the proper format for submission to the City. The Contractor shall access the system through the internet using a compatible web browser from the Contractor's administrative field office location, and/or other locations where work associated with the Project is being performed.
- C. The Contractor shall be required to generate Project documents and records utilizing the aforementioned system. The Contractor shall be required to transmit and submit the Project documents within the system to the City.
- D. The Contractor shall utilize a high capacity scanner capable of scanning 11 x 17 documents, double sided, on site for the entire duration of the Project. All documents must be scanned in and attached to the appropriate DTCS document, including submittals, shop drawings, O&M's and all other documents requested by the Engineer.



- E. The Contractor shall utilize the DTCS to create and maintain Project documents, including, but not limited to the following:
1. Company Directory: Addresses, Phone Numbers, Personnel Contacts, etc.
  2. Drawings Log: Current Drawing revision log
  3. Submittals (Integrated with Project Schedule through Activity codes)
  4. Transmittals
  5. Requests for Information and Answers (RFIs)
  6. Change Documents, Including:
    - a. Requests for Proposal (RFPs)
    - b. Work Authorizations (WAs)
    - c. Change Order Requests (CORs)
    - d. Change Orders (CO)
    - e. Design Clarifications (DC)
  7. Daily Reports (Daily Diaries)
  8. Field Decisions & Clarification Memos
  9. Notice of Non-Compliance
  10. Construction Issue Memos
  11. Punchlists
  12. Meeting Minutes & Agendas
  13. Correspondence
  14. Work Plans
  15. Start-up Plans

- 16. Equipment Operation and Maintenance Training
- 17. Spare Parts

- F. The Contractor shall utilize the complete capabilities of the DTCS to meet the requirements of this Section. The Contractor shall provide a highly trained and experienced construction project controls person knowledgeable in construction work sequencing, productivity, scheduling and application of the DTCS. This person, along with the Contractor's management team, shall work closely with the City to deliver the documents outlined in this Section
- G. Software Support

The Contractor is to provide for a one day training class in the base bid for the Lynx PM software for ten (10) personnel, seven (7) for City of Atlanta and three for the Contractor. The type of class to be determined by the City. The Contractor may contact Lynx PM Representative at 1-877-955-7711.

The Contractor shall be required to establish an internet connection using DSL or better to connect to the DTCS to permit the forwarding and receipt of documents.

- a. The DTCS will support the following Email programs, and the Contractor is to utilize:
    - (1) Microsoft Outlook 2003
    - (2) Microsoft Outlook 2007
- H. The Contractor shall be required to attend a 2-day training session on the operation of the City's DTCS. The training session shall be attended by the Contractor (limited to three participants) as well as representatives of the Owner (seven participants). The Contractor shall be responsible for the cost of training for additional members of their firm or future retraining, as may be deemed necessary by the Contractor.
- I. The Contractor shall meet with the City within 15 days after the Contract is awarded to discuss access requirements and the Contractor's plan to utilize DTCS and execute the document control functions herein.
- J. Access through the internet to the DTCS shall be operational within 30 days following the pre-construction meeting date. This must be

operational from the contractor's administrative field office location.

## **1.02 COMPANY DIRECTORY**

The Contractor and the City will monitor and manage the Company Directory. The directory must include Company name, Company abbreviation, contact names, address, phone numbers and e-mail addresses.

## **1.03 DRAWING LOG**

The City will maintain a log of initial "issued for construction" drawings in the DTCS. Information shall include drawing number, title and revision number. In addition to logging the initial project drawing list, the City will maintain a log on the DTCS of all subsequent revisions to these drawings and any sketches resulting from clarification memos, RFIs, field orders and Change Orders. It is the Contractor's responsibility to utilize the latest drawings and sketches in the performance of the work.

## **1.04 SUBMITTALS/SHOP DRAWINGS**

- A. Requirements: This section specifies supplemental requirements to GC-28, related to the processing of submittals and shop drawings. The Contractor will utilize the DTCS to log and track submittals, as well as generate associated transmittal letters.
- B. Submittals & Product Data: A list of all required submittals will be entered into the DTCS by the Contractor. Submittals shall be incorporated into packages, with the submittal numbering format to be provided by the COA's engineer. The Contractor will log and track all submittals utilizing the DTCS. Each review cycle shall be entered into the DTCS. The Contractor shall identify as activities in the CPM schedule, specified in SC-16, to include all data submittals, as well as those involving complex reviews and long lead deliveries, and all procurement items required for construction activities. Submittal schedule information shall be updated monthly with the Contractor's updated project CPM schedule, as specified in SC-16.
- C. Samples: A list of all required sample submittals will be entered into the DTCS by the Contractor. Sample submittals shall be identified as individual submittals within the submittal packages with numbering as specified above.
- D. Guarantees/Warranties: A list of all required Guarantee/Warranty submittals will be entered into the DTCS by the Contractor. These submittals shall be identified as individual submittals within the submittal packages with numbering as specified above.

- E. Work Plans, Start-up Plans, O&M Submittals and Spare Parts: All testing, Start-up and O&M submittals will be entered into the DTCS by the Contractor. These submittals shall be identified as individual submittals within the submittal packages identified with numbering as specified above.
- F. Submittal Procedures: The Contractor shall prepare all submittal packages utilizing the submittal numbering system, description and packaging conventions described above. Submittals prepared by the Contractor, which fail to follow the conventions described above, will be returned “amend and resubmit”. Should the Contractor determine that a submittal is required and is not covered by the listing within the DTCS, consultation with the City to determine the submittal number, description and packaging will be required.

## **1.05 CORRESPONDENCE**

The City shall monitor and manage the correspondence, Non-Compliance Notices, Field Decisions & Clarification Memos and Construction Issue Memo logs. The Contractor is responsible for generating Project correspondence within the DTCS, and forwarding the correspondence to the City.

## **1.06 TRANSMITTAL LOG**

The Contractor and the City will monitor and manage the transmittal log. All Project transmittals shall be created electronically, automatically sequentially numbered and logged into the DTCS system as they are created. The Contractor is responsible for utilizing the system to create transmittals for items transmitted to the Owner, Engineer, Resident Inspection Staff and other Contractors.

## **1.07 REQUEST FOR INFORMATION & ANSWERS**

The Contractor shall be responsible for generating RFIs on the DTCS system. The Contractor shall notify the City when an RFI is submitted. The City will monitor and manage the RFI log. The City will generate an Answer document in response to each RFI and forward them to the Contractor. The DTCS will track “Ball in Court” for all RFIs and Answers, as well as date of original generation and response date. In addition the RFIs will reference the relative Specification Section and Drawings. The DTCS will identify the date of the request and the originator, responsible party for a response and the date of the response.

## **1.08 CHANGE DOCUMENTS**

Change documents include Request for Information (RFIs), Work Authorization

Requests (WARs), Work Authorizations (WAs), Change Orders Requests(CORs), Design Clarifications (DCs), and Change Orders (COs). All change documents will be monitored and managed by the City utilizing the DTCS. The DTCS will track "Ball in Court" status of all change documents.

## **1.09 DAILY REPORTS**

The Contractor is responsible for creating daily reports (daily diaries) utilizing the DTCS. The Contractor is required to enter the Daily Reports into the DTCS by 10:00 a.m. of the subsequent day that the Contractor or any subcontractor performs work. All daily reports shall be logged into the DTCS by the Contractor. The Contractor shall also provide one signed hard copy of all daily reports on a weekly basis. Required information shall include Contractor, Date, Day, Temperature, Precipitation, Sky, Wind, Work Activity, Equipment, Field Force, Visitors, Materials, and Scheduled Activities utilizing the Primavera schedule activity codes. Daily reports which fail to link work activities to the active Primavera schedule will not be acceptable.

## **1.10 PUNCHLISTS**

The City will monitor and manage Punchlists, and will create Punchlists to be forwarded to the Contractor. The Contractor shall address the punchlist items that have been assigned to the Contractor and forward updates to the City. Once accepted as complete, the City will access the punchlist in the DTCS and close it out.

## **1.11 MEETING MINUTES AND AGENDA**

The City shall monitor and manage the meeting minute process. The City will forward meeting minutes to the Contractor electronically. The City will log the meeting minute items into the DTCS within three (3) days of the meeting date.

## **1.12 PROGRESS PAYMENTS /REQUISITIONS FOR PAYMENT**

The Contractor is responsible for creating progress payment applications directly from the DTCS and then forwarding them to the City electronically along with hard copies by 4:00 p.m. at the end of each update/billing period. The Contractor shall also simultaneously provide a separate submittal of the updated progress schedule (P6 or latest version at the time of purchase), as specified in SC-16. All Progress Payments and schedule of values shall be developed as defined in the Special Conditions. Required information within the Pay Application shall be coordinated with the City's Project Manager. Maintenance of the "As Built" record documents by the Contractor shall be verified before processing will be approved. Failure of a Contractor to maintain project record

documents, maintain current and properly prepared daily reports or to submit the project schedule update per SC-16 will be just cause for withholding of the monthly or final payment.

### **1.13 LYNX PHOTO MANAGEMENT SOFTWARE**

The Lynx PM software shall be utilized by the City and the Contractor for the duration of the project. The daily construction photographs will be the permanent visual record of the pre-construction conditions, daily construction site activities, and the completion of construction work. The Contractor must submit to the City no less than four (4) record photos for each activity ID listed in the project schedule per the last schedule update. Applicable photos must accompany each Pay Application.

\*\*\* END OF SECTION 01350 \*\*\*

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## SECTION 01351

### Public Involvement

#### **PART 1 - GENERAL**

##### **1.01 SCOPE**

- A. The Contractor shall provide all personnel, services, and materials as specified under this Section necessary to meet the requirements and responsibilities related to the Public Involvement and Public Relations and Outreach as specified hereinafter, during performance of Work under the Agreement by the Contractor.
- B. Unless specifically stated otherwise within the Agreement, no separate payment will be made for satisfying Public Involvement requirements.

#### **PART 2 - PRODUCTS (NOT USED)**

#### **PART 3 - EXECUTION**

##### **3.01 PUBLIC INFORMATION KICK-OFF MEETING**

Prior to commencement of Work under the Agreement and following the Preconstruction Meeting, the Contractor, the Project Manager (PM), Construction Manager (CM), Public Information Manager (PIM), Public Information Officer (PIO), and the City's Engineer will be required to attend a public information meeting hosted by the DWM Office of Communications and Community Relations. At this meeting the Contractor's responsibilities will be discussed, the relationship with the OCCR, the City's Engineer and/or designated representative of the City. The Contractor and staff will also be advised as to the expectations of the City regarding citizen relations and inquiries, as well as public notification protocols.

##### **3.02 DOOR-HANGERS**

- A. The Contractor shall produce door hangers required for notice to customers/citizens and residents from the template provided by the City's PIM as specified hereinabove in paragraph 3.02. Door hangers shall be utilized for notification in the event of, but not limited to, the following events:
  - 1. Planned service disruption/outages
  - 2. Road closures/detours/traffic pattern changes
  - 3. Access/entrance to property



4. Work start-up
5. CCTV
6. Smoke Testing
7. Dye Testing

### 3.03 IMPACTED AREA ADDRESS DATABASE

- A. The Contractor shall provide the Office of Communications and Community Relations with a database of addresses and phone numbers (and names if available) of all project impacted residences, businesses and facilities at least three (3) weeks prior to project start-up. The database will be used by the City's PIO for regular citizen communications and notifications.
- B. The Contractor and Engineer shall copy the City's PIO on all correspondence with citizens and property owners.

### 3.04 CUSTOMER SERVICE TRACKING SOFTWARE

- A. The Contractor shall use the City's Project Management Software to track and enter information from customers/citizens regarding complaints, claims and inquiries. All related information shall be updated on a daily basis. Tracking information and responses shall be coordinated with the City's PIO. Reports shall be provided as weekly updates on all activities and on specific cases within twenty-four (24) hours when requested.
- B. Information recorded shall include but not be limited to the following:
  1. Date complaint/claim/inquiry received.
  2. Name, address and telephone number of individual filing complaint/claim/inquiry.
  3. Nature of complaint/claim/inquiry.
  4. Address where problem is located if different than above.
  5. Action required, date, action taken, date action completed.
  6. Follow-up with person who filed under 2 above to verify satisfaction or status.
  7. Documents associated with actions taken.
  8. Any information regarding resolution with the Contractor's, Subcontractor's or Vendor's Insurance Company shall be fully documented.

### 3.06 IDENTIFICATION BADGES AND SECURITY

- A. All members of the Contractor's staff and his subcontractor's permanent staff at or above the level of foreman who will be working on-site will be issued an ID badge by the City. The ID badge will list the worker's name and company Affiliation and will include a picture.
- B. A template will be provided by the PIM and shall be returned to the Office of Security and Safety when updated with the above information for signature by the Director of Security and Safety.
- C. It shall be the Contractor's responsibility to collect the ID badges from any employee who is discharged or resigns prior to completion of the project as well as at completion of the project. The Contractor shall return all ID badges to the Office of Security and Safety within 48 hours of their collection. The Contractor will be charged a fee of **\$25.00** per badge for any badge not returned at completion of the project. For any ID badges lost during the term of the project that must be reissued, there will be a charge of **\$15.00** per ID badge. The Contractor shall deduct these charges from his periodic or closeout payment request or the City will deduct.
- D. Since lower level personnel of the Contractor, Subcontractor or Vendor will not be issued ID badges, the Contractor must maintain a daily sign-in sheet for daily workers under his supervision. The Superintendent must be able to identify any employee on the site as a bona fide worker if asked and if not able to identify, the Engineer will direct the Superintendent to remove the individual from the site. The Contractor and Subs or Vendors will provide a program of temporary ID badges and/or laminated on-site passes that must be cross-referenced to each day's employee time card/payroll sheet with unique employees' numbers. Any employee that will be on the Project over thirty (30) days will be issued a picture ID with the employee number prominently shown. Any employee possessing an ID badge must wear that badge visibly at all times on the Project. The Contractor is responsible for maintaining a safe "drug-free" work environment.
- E. The Contractor shall develop a Security Plan for use on the job site during construction. The Plan shall encompass as a minimum such topics as the use of pre-employment background checks for specific project staff, drug tests, crime prevention and anti-theft procedures, workplace violence and methods to secure project documents. All staff working on the site shall be familiar with the requirements of the Security Plan.
- F. City Ordinances prohibit the carrying of weapons on City streets. The City of Atlanta Police Department will be notified of any person bringing weapons to the jobsite; they will be removed immediately and prosecuted.
- G. All of the Contractor's staff at or above the level of foreman shall attend a 4-hour mandatory CMG Security Training session conducted by the Office of Security and Safety. Multiple training sessions will be offered and staff must complete the

training at least within 1 month of commencing work on the jobsite. All costs associated with the training will be considered as incidental to the Contract.

- H. Persons on the jobsite shall report any suspicious activity by workers or by others at the jobsite area first to the Project Management, and/or Atlanta Police Department by calling 911 and immediately to the Director of Security and Safety.

### 3.07 SCHEDULE

- A. The Contractor shall provide the City's PIO with a copy of the detailed project schedule following approval by the Engineer.
- B. Bi-weekly, the Contractor shall provide a list of properties:
  - 1. That will be affected by the Contractor's activities within the upcoming 4 weeks;
  - 2. Where work is ongoing in the right of way in front or in the back of the property;
  - 3. Where site restoration activities are ongoing.
- C. The Contractor shall inform the City's PIO through the weekly progress meetings and in writing of any project schedule changes or changes in "disruptive work" such as blasting, road closures, etc., that would have significant impact on citizens or require prior citizen notification. The Contractor shall notify the City's PIO of any "disruptive" activities affecting the public that occur on the jobsite within 4 hours of their occurrence.

### 3.08 MAPS

The Contractor will provide the assigned City's PIO with a map of each project area assigned by task order, including the proposed and existing sewer overlays. The map will include property lines and addresses, so the Contractor can identify the areas of impacted properties.

### 3.09 MEDIA RELATIONS AND JOB SITE INQUIRIES

- A. As specified above in paragraph 3.01, only authorized persons shall release any information to media inquiries. The Contractor's field personnel shall at all times have project information cards available that will be provided to media and citizens if inquiries are made on-site. All inquiries shall be directed to the person referred to on the card and citizens shall be referred to the DWM Project Hotline telephone number (404-546-3200) and the [www.Atlantawatershed.org](http://www.Atlantawatershed.org) website
- B. Project information cards shall be produced by the Contractor from the template provided by the DWM Office of Communications and Community Relations. Final language to be included on the Project Information Card will be provided.

### 3.10 VEHICLES SIGNS & PROJECT SITE SIGNAGE

- A. The Contractor shall place the COA logo, project name, Help line number, and website address on all magnetic vehicle signs specified in Specification Section 01580. Vehicle signs shall be installed on all vehicles used for Work on this project. A signage template will be provided by the DWM Office of Communications and Community Relations and produced by the Contractor.
- B. Note: The cost for the production, installation and maintenance of the signs will be paid for through the respective unit price bid items, in accordance with specification Section 01580.
- C. All project sites shall have pre-approved project signs which read in accordance with the Template provided as part of the Special Conditions Signs shall be produced by the Contractor. Some of the signs shall be mounted on moveable skids so they can be relocated as the project progresses on various streets in the basin. Sizes will vary, but all will be smaller than the 96"x 48" size project signs shown. Size shall be as directed by the Engineer. Contractor shall provide a minimum of 1 project sign per work location. The sign is required in addition to the four City of Atlanta Project signs identified in the Special Conditions.

### 3.11 NOTIFICATIONS

- A. The Contractor shall provide the following notifications to the City's PIO and the City's PIM to facilitate communication to affected citizens through automated phone message or mailers:
  - 1. Anticipated work start date-must be three (3) weeks prior so the City's PIO may send out two (2) week notice mailer.
  - 2. Service disruptions-notify the City's PIO at least 72 hours in advance so that 48-hour notice automated phone message notice may be issued.
  - 3. Street Closure or Partial Closure-notify the City's PIO at least 72 hours in advance to permit 48-hour automated phone message.
  - 4. Significant work in neighborhood- blasting, directional drilling, trenchless installation, smoke testing, dye testing, open cut, etc.-notify the City's PIO at least 72 hours in advance to permit 48-hour automated phone message.
- B. The Contractor shall provide the following door hanger notifications and the manpower to deliver them at a minimum:
  - 1. Service disruptions- notice to citizens 24 hours prior to disruption.
  - 2. Street Closure or Partial Closure - notify fire, police other emergency services and other authorities 24 hours prior to street closure.

3. Significant work in neighborhood- blasting, directional drilling, trenchless installation, open cut, etc.-notify citizens via door hangers 24 hours in advance.
- C. The Contractor shall be fully responsible for notification to all emergency related services for detours, closures (partial or full) or traffic pattern changes and as such they must be detailed in their traffic control plan and implemented through the Contractor's Traffic Control Manager and per all permitting requirements.
- D. The Contractor shall be fully responsible for distributing all notifications a minimum of 48 hours in advance of service outages for schools, nursing homes, hospitals, medical clinics, assisted living facilities or other types of facilities. Contractor shall also make personal contact with facility representatives no later than 60 minutes prior to the outage.
- E. The Contractor shall at all times coordinate with the City's Office of Communications and Community Relations and Call Center to provide detailed schedules and street locations for service disruptions or street closures to ensure that Call Center is well equipped to provide adequate response to citizen inquiries.

### 3.12 RESPONSES AND RESOLUTION OF CITIZEN INQUIRIES

- A. Customer Service Tracking Software: The Contractor shall use the City's Project Management Software to enter status information and track inquiries related to the project. The City Call Center attendant shall create the initial file and enter information for resident and property owner complaints and/or claims. This information shall be updated on daily bases. Tracking information and responses shall be coordinated with the Contractor and City's PIO.
- B. When a City of Atlanta's Call Center attendant informs the Contractor of a citizen inquiry or complaint, the Contractor shall respond immediately to the call center if the inquiry is related to an emergency situation. If the inquiry is general, the contractor's response is required within 24 hours to the call center with an update on the resolution status. The citizen's name date and time of call and complaint shall be documented and tracked by the Contractor using the City's Project Management Software database, which will assign a complaint tracking number. The complaint information will be transmitted to the Contractor and PIO within 24 to 48 hours. The citizen will receive a follow-up call from the call center with the status information on the resolution of the problem within 24 hours, and additional follow-up calls until the problem is resolved.
- C. Unresolved inquiries will be reviewed at project progress meetings. At this time, the City's PIO will review open inquiries and the Contractor's Representative will facilitate follow-up on resolution.

### 3.13 RESOLUTION OF COMPLAINTS AND CLAIMS

Failure of the Contractor to resolve any legitimate complaint or claim filed resulting from the work performed under this contract, following notice in accordance with the contract agreement, may result in resolution of the complaint or claim by the City. The Contractor will be charged for the associated cost in accordance with the applicable sections of the contract. No additional payment will be made to the Contractor for any costs associated with complaint or claim resolution, same being incidental to the various contract items which are bid. Failure to manage the issues and items adequately to minimize public complaints and impacts will be cause for increasing the retainage, withholding payment and/or Notice and Termination of the Contractor cause if more than 10% of the noticed complaints or claims age past 30 days without decisive resolution and scheduling of recovery work.

### 3.14 PROJECT UPDATES

The Contractor will provide monthly project updates regarding significant progress, notable changes, and any consent decree milestones to be used by the DWM Office of Communications and Community Relations staff to update the Atlantawatershed.org website, project materials, monthly and quarterly reports.

### 3.15 RIGHTS OF ENTRY AND ACCESS TO PRIVATE PROPERTY

- A. The Contractor is required to coordinate with the Office of Engineering Services Land and Easement Group regarding obtaining Rights of Entry and related agreements with the property owner(s) to access or work outside of the City's existing easements or rights of way or any agreements related to property restoration , as may be necessary for the Work or at the convenience of the Contractor. Such coordination shall include the following:
  - 1. Maintaining a contact log with, but not limited to, all: contact names, addresses and phone numbers; all attempts (with date, name, and notes of conversation) via telephone, in person, or via written correspondence. The Contractor must maintain copies of all written correspondence with the property owner(s) and/or tenant(s), and provide the City with Copies, if directed by the City or already required as part of this Section;
  - 2. Assuming responsibility relating to the private property access and any agreements reached between the Contractor and the Property Owner;
  - 3. Taking any other steps as reasonably necessary to adequately protect the interests of Contractor, the private property owner and the City with respect to the accessing the City's existing easement areas;
- B. The Contractor is required to work within the City's existing easement areas and rights of way at all times; however, at the Contractor's convenience and if agreed upon between

the Contractor and the Property Owner the Contractor may follow a route other than along the City's right of way alignment . In such case, the Contractor must have a written agreement with the Property Owner to document the terms and conditions of the Work and/or property restoration, which shall be subject to the City's review and approval. Any such agreement shall be at the Contractor's expense.

- C. The Contractor must identify all parcels requiring access or Work associated with the project, including parcels owned by: CSX, Norfolk Southern, Georgia Power, Fulton County, DeKalb County, Atlanta Housing Authority, MARTA, Schools, or City owned parcels under the purview of another department, within the first 30 days after the NTP has been officially delivered to the Contractor. Permits and agreements with such property owners to perform Work may be required as a condition of commencement of Work on properties owned by such entities. As such, Contractor shall cooperate with the City to negotiate and enter into appropriate agreements with such property owners to prior to commencement of Work in a form acceptable to the City.
- D. The Contractor must identify all areas where the Contractor believes it is physically impossible to perform the work in the existing easement area within the first 30 days after the NTP has been officially delivered to the Contractor. If any such area exists, the Contractor must state in writing the property information (address and tax PIN), the work to be performed, and the reason they believe it is impossible to work within the easement area. If the City deems it is impossible to perform the work in the City's existing easement area and/or rights of way, the City will proceed with the acquisition of required temporary construction easement or other interests necessary to perform the Work. The City will make the ultimate decision regarding the ability or inability of the work to be performed within the existing easement area and shall provide such determinations in writing to the Contractor. In the instances for which formal acquisition processes must occur, Contractor shall take all available steps to prioritize work in other areas to avoid delays in overall project work. The City shall not be responsible for unapproved damage to private properties or deviations from the rights of way and/or easement areas for the convenience of the Contractor.
- F. Contractor must, in all dealings with private property owners concerning this type of access to their property, advise that the Contractor is an independent contractor and is not seeking or obtaining access to private property on behalf of the City. Contractor must include this advisement in all written communications with any private property owner, as well as all documents evidencing or relating to agreed access to private property. Contractor may at any time during the course of performing the Work request clarification of the City's existing easements and/or rights of way through an RFI process.

## ***ATTACHMENT A***

***Citizens Comments Response***

***PROJECT #***

**PROJECT NAME:**

**Basic Data**

Contact ID:

First Name		Last Name		Council District / NPU	
<input type="text"/>		<input type="text"/>		<input type="text"/>	
Address	Number	Street Name	St, Ave, etc.	Apt. #	Zip
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Home Phone	(    )    - <input type="text"/>		Work Phone	(    )    - <input type="text"/>	
Email :	<input type="text"/>			Outside Project Area	<input type="text"/> Y____ N____
Notes:	<input type="text"/>				

**Comments / Complaints / Request**

Comment Date	<input type="text"/> ____/____/____	Engineer needs to	<input type="text"/> Y____ N____
Comment / Complaint:			
<input type="text"/>			

**Response**

Response Date	<input type="text"/> ____/____/____	Is Follow-up Required	<input type="text"/> Y____ N____
Who Responded	<input type="text"/>		
Response Given:			
<input type="text"/>			



## Sewer Cleaning and Pipeline Assessment Contract

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**SECTION 01400**

**QUALITY ASSURANCE/QUALITY CONTROL**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. This section includes requirements for the implementation of the Contractor's quality assurance and quality control program.

**1.02 SITE INVESTIGATION AND CONTROL**

- A. Contractor shall check and verify all dimensions and conditions in the field continuously during construction. Contractor shall be solely responsible for any inaccuracies built into the Work due to Contractor's and subcontractor's failure to comply with this requirement.
- B. Contractor shall inspect related and appurtenant Work and report in writing to the Engineer any conditions that will prevent proper completion of the Work. Failure to report any such conditions shall constitute acceptance of all Site conditions, and any required removal, repair, or replacement caused by unsuitable conditions shall be performed by the Contractor solely and entirely at Contractor's expense.

**1.03 INSPECTION OF THE WORK**

- A. All work performed by the Contractor and subcontractors shall be inspected by the Contractor and non-conforming Work and any safety hazards in the work area shall be noted and promptly corrected. The Contractor is responsible for the Work to be performed safely and in conformance to the Contract Documents.
- B. The Work shall be conducted under the general observation of the Engineer and is subject to inspection by the City of Atlanta or representatives of the City acting on their behalf to ensure strict compliance with the requirements of the Contract Documents. Such inspection may include mill, plant, shop, or field inspection, as required. The Engineer or any inspector(s) shall be permitted access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated.
- C. The presence of the Engineer, or any inspector(s), however, shall not relieve the Contractor of the responsibility for the proper execution of the Work in accordance with all requirements of the Contract Documents. Compliance is the responsibility of the Contractor. No act or omission on the part of the Engineer, or any inspector(s) shall be construed as relieving Contractor of this responsibility.

Inspection of Work later determined to be non-conforming shall not be cause or excuse for acceptance of the non-conforming Work. The City may accept non-conforming Work when adequate compensation is offered and it is in the City's best interest as determined by the City.

- D. All materials and articles furnished by the Contractor or subcontractors shall be subject to rigid documented inspection, by qualified personnel, and no materials or articles shall be used in the Work until they have been inspected and accepted by the Contractor's Quality Control representative and the Engineer or other designated representative. No Work shall be backfilled, buried, cast in concrete, covered, or otherwise hidden until it has been inspected. Any Work covered in the absence of inspection shall be subject to uncovering. Where uninspected Work cannot be easily uncovered, such as in concrete cast over reinforcing steel, all such Work shall be subject to demolition, removal, and reconstruction under proper inspection at the Contractor's expense.
- E. All materials, equipment and/or articles furnished to the Contractor by the City shall be subject to rigid inspection by the Contractor's Quality Control representative before being used or placed by the Contractor. The Contractor shall inform the Engineer, in writing, of the results of said inspections within one working day after completion of inspection. In the event the Contractor believes any material or articles provided by the City to be of insufficient quality for use in the Work, the Contractor shall immediately notify the Engineer.

#### **1.04 TIME OF INSPECTION AND TESTS**

- A. Samples and test specimens required under these Specifications shall be furnished and prepared for testing in ample time for the completion of the necessary tests and analyses before said articles or materials are to be used. The Contractor shall furnish and prepare all required test specimens at Contractor's own expense.
- B. Whenever the Contractor is ready to backfill, bury, cast in concrete, hide, or otherwise cover any Work under this Contract, the Engineer shall be notified not less than three work days in advance to request inspection before beginning any such Work of covering. Failure of the Contractor to notify the Engineer at least three work days in advance of any such inspections shall be reasonable cause for the Engineer to order a sufficient delay in the Contractor's schedule to allow time for such inspection. The costs of any remedial or corrective work required, and all costs of such delays, including its impact on other portions of the Work, shall be borne by the Contractor.

#### **1.05 SAMPLING AND TESTING**

- A. The Contractor shall retain and pay for an independent materials testing agency approved by the Engineer and the City of Atlanta as required by the General

Conditions. This independent testing agency will develop and submit a testing plan for quality assurance on each type of work activity. The testing agency will document the processes and procedures utilized to verify and maintain quality work. When not otherwise specified, all sampling and testing shall be in accordance with the methods prescribed in the most current standards, as applicable to the class and nature of the article or materials considered. However, the Engineer reserves the right to use any generally accepted system of inspection which, in the opinion of the Engineer, will ensure the Engineer that the quality of the workmanship is in full accord with the Contract Documents.

- B. The City reserves the right to abbreviate, modify the frequency of or waive tests or quality assurance measures, but waiver of any specific testing or other quality assurance measure, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial work, shall not be construed as a waiver of any technical or qualitative requirements of the Contract Documents.
- C. Notwithstanding the existence of such waiver, the City shall reserve the right to make independent investigations and tests as specified in the following paragraph and failure of any portion of the Work to meet any of the qualitative requirements of the Contract Documents, shall be reasonable cause for the City to require the removal or correction and reconstruction of any such Work.
- D. In addition to any other inspection or quality assurance provisions that may be specified, the City shall have the right to independently select, test, and analyze, at the expense of the City, additional test specimens of any or all of the materials to be used. Results of such tests and analyses shall be considered along with the tests or analyses made by the Contractor to determine compliance with the applicable specifications for the materials so tested or analyzed provided that wherever any portion of the Work is discovered, as a result of such independent testing or investigation by the Engineer, which fails to meet the requirements of the Contract Documents, all costs of such independent inspection and investigation and all costs of removal, correction, reconstruction, or repair of any such Work shall be borne by the Contractor.

#### **1.06 CONTRACTOR'S QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS**

- A. The Contractor shall establish and execute a Quality Assurance/Quality Control (QA/QC) program for the services that are being procured from the Contractor. The program shall provide the Contractor with adequate measures for verification and conformance to defined requirements by the Contractor's personnel and subcontractors (including fabricators and suppliers). This program shall be described in a Plan responsive to this Section. It shall utilize the services of an

independent testing agency/company that is industry certified to provide quality assurance and compliance with the standards specified.

- B. The Contractor shall furnish the Engineer a project specific QA/QC Plan. The Plan shall contain a comprehensive account of Contractor's QA/QC procedures as applicable to this job. The Contractor shall furnish for review by the Engineer, no later than 14 days after receipt of notice to proceed, the QA/QC plan proposed to be implemented. The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. Construction will be permitted to begin only after acceptance of the QA/QC Plan. The detailed requirements for this Plan are delineated in the following paragraphs. No payments will be made to the Contractor until the QA/QC Plan is fully accepted by the Engineer.
- C. The QA/QC Plan shall describe and define the personnel requirements described herein. The Contractor shall employ a full time on-site QA/QC Manager to manage, address and resolve all quality control issues.
  - 1. The QA/QC Manager shall be as identified by the Contractor and approved by the City. The QA/QC Manager shall have a minimum of five (5) years of construction experience in pipe line installation. The QA/QC Manager shall be onsite at all times while work is being performed by the contractor, to remedy and demonstrate that work is being performed properly and to make multiple observations of all Work in progress. This individual shall be dedicated solely to QA/QC activities and shall have no supervisory or managerial responsibility over the work force. The QA/QC Manager shall not be assigned any other duties or roles by the Contractor.
  - 2. The Contractor shall provide additional personnel who are assigned to assist the QA/QC Manager as required to fulfill the requirements of the QA/QC Plan. The Contractor shall provide a copy of the letter to the QA/QC Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the QA/QC Manager, including authority to stop work which is not in compliance with the contract. The QA/QC Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Engineer.
- D. The Contractor's QA/QC program shall ensure the achievement of adequate quality throughout all applicable areas of the Project. A customized QA/QC Plan shall be developed that discusses each type of work that the Contractor is responsible for within the Project. The QA/QC Plan shall describe the program and include procedures, work instructions and records and a description of the quality control organization.

1. The description of the quality control organization shall include a chart showing lines of authority staffing plan and acknowledgment that the QA/QC staff shall implement the system for all aspects of the work specified. The staffing plan shall identify the name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a QA/QC function including the QA/QC Manager.
  2. In addition, the Plan shall describe methods relating to areas that require special testing and procedures as noted in the specifications.
- E. Identification and Control of Items and Materials: Procedures to ensure that items or materials that have been accepted at the site are properly used and installed shall be described in the QA/QC Plan.
- F. The procedures shall provide for proper identification and storage, and prevent the use of incorrect or defective materials.
- G. Inspection and Tests: The Contractor shall have written procedures defining a program for control of inspections performed and these procedures shall be described in the QA/QC Plan.
1. Inspections and tests shall be performed and documented by qualified individuals. At a minimum, "qualified" shall mean having performed similar QA/QC functions on similar type projects for a minimum of five (5) years and possession of industry standards certification and license. Records of personnel experience, training and qualifications shall be submitted to the Engineer for review and approval.
  2. The Contractor shall maintain and provide to the Engineer, within two working days of completion of each inspection and test, adequate records of all such inspections and tests. Inspection and test results shall be documented and evaluated to ensure that requirements have been satisfied.
  3. Procedures shall include:
    - a. Specific instructions defining procedures for observing all Work in process and comparing this Work with the Contract requirements (organized by specification section).
    - b. Maintaining and providing daily QA/QC inspection reports. Such reports shall, at a minimum, include the following:
      - i. Dated list of Item(s) inspected
      - ii. Location of the test sample(s)
      - iii. Logs, detailed locational drawings and confirmation reports
      - iv. Quality characteristics in compliance
      - v. Quality characteristics not in compliance
      - vi. Corrective/remedial actions taken

- vii. Statement of certification
    - viii. QC Manager's signature
  - c. Specific instructions for recording all observations and requirements for demonstrating through the reports that the Work observed was in compliance or a deficiency was noted and action to be taken.
  - d. Procedures to preclude the covering of deficient or rejected Work.
  - e. Procedures for halting or rejecting Work.
  - f. Procedures for resolution of differences between the QA/QC representative(s) and the production representative(s).
  - g. Method of documenting QA/QC process and results including:
    - i. Automatic exception reporting
    - ii. Resolution tracking
    - iii. Quality Confirmation Test reports
    - iv. Sample retention index and storage
- 4. The QA/QC Plan shall identify all contractual hold/inspection points as well as any Contractor imposed hold/inspections points.
- 5. The QA/QC Plan shall include procedures to provide verification and control of all testing provided by the Contractor including:
  - a. Individual test records containing the following information:
    - i. Item tested –item number and description
    - ii. Test results
    - iii. Test designation
    - iv. Test work sheet including location sample was obtained
    - v. Acceptance or rejection
    - vi. Date sample was obtained
    - vii. Retest information, if applicable
    - viii. Control requirements
    - ix. Tester signature
    - x. Testing QC staff initials
  - b. Maintaining and providing to the Engineer daily testing records. Such records shall, at a minimum, contain the following:
    - i. Dated list of Item(s) inspected
    - ii. Location of the test sample(s)
    - iii. Logs, detailed location drawings and confirmation reports
    - iv. Quality characteristics in compliance
    - v. Quality characteristics not in compliance
    - vi. Corrective/remedial actions taken
    - vii. Statement of certification
  - c. QC Manager's signature providing for location maps/drawings (i.e. lift drawings, laying schedules, etc.) for all tests performed or location of Work covered by the tests.
  - d. Maintaining copies of all test results.
  - e. Ensuring Engineer receives independent copy of all tests.

- f. Ensuring testing lab(s) are functioning independently and in accordance with the specifications.
  - g. Ensuring re-tests are properly taken and documented.
- H. Control of Measuring and Test Equipment: Measuring and/or testing instruments shall be adequately maintained, calibrated, certified and adjusted to maintain accuracy within prescribed limits. Calibration shall be performed at specified periods against valid standards traceable to nationally recognized standards and documented.
- I. Supplier Quality Assurance: The QA/QC Plan shall include procedures to ensure that procured products and services conform to the requirements of the Specifications. Requirements of these procedures shall be applied, as appropriate, to subcontractors and suppliers. QA/QC inspections and certifications shall not be deferred to the Contractor's subcontractors or suppliers.
- J. Deficient, Defective and Non-conforming Work and Corrective Action
  - 1. The QA/QC Plan shall include procedures for handling of deficiencies and non-conformances. Deficiencies and non-conformances are defined as documentation, drawings, material, and equipment or Work not conforming to the specified requirements or procedures. The procedures shall prevent non-conformances by identification, documentation, evaluation, separation, disposition and corrective action to prevent recurrence. Conditions having adverse effects on quality shall be promptly identified and reported to the senior level management. The cause of conditions adverse to quality shall be determined and documented and measures implemented to prevent recurrence. In addition, at a minimum, this procedure shall address:
    - a. Personnel responsible for identifying deficient and non-complying items within the work.
    - b. How and by whom deficient and non-compliant items are documented "in the field".
    - c. The personnel and process utilized for logging deficient and non-compliant work at the end of each day onto a Deficiency Log.
    - d. Tracking processes and tracking documentation for Deficient and Non-Compliant items.
    - e. Personnel responsible for achieving resolution of outstanding deficiencies.
    - f. Once resolved, how are the resolutions documented and by whom.
- K. Special Processes And Personnel Qualifications
  - 1. The QA/QC Plan shall include detailed procedures for the performance and control of special process (e.g. welding, soldering, heat treating, cleaning, plating, nondestructive examination, etc.).



2. Personnel performing special process tasks shall have the experience, training and certifications commensurate with the scope, complexity, or nature of the activity. They shall be approved by the Engineer before the start of Work on the Project.

L. Audits

1. The Contractor's QA/QC program shall provide for documented audits to verify that QA/QC procedures are being fully implemented by the Contractor as well as its subcontractors. Audit records shall be made available to the Engineer upon request.
2. The Contractor shall provide to the City, a quarterly report indicating any outstanding and unresolved exceptions to the QA/QC program or contract documents. The report will include documentation on any standards modifications, corrections, failed tests and a review of field procedures and checks and balances effectiveness.

M. Documented Control/Quality Records

1. The Contractor shall establish methods for control of Contract Documents that describe how Drawings and Specifications are received and distributed to assure the correct issue of the document being used. The methods shall also describe how as-built data are documented and furnished to the Engineer.
2. The Contractor shall maintain evidence of activities affecting quality, including operating logs, records of inspections and tests, audit reports, material analyses, personnel qualification and certification records, procedures, and document review records.
3. Quality records shall be maintained in a manner that provides for timely retrieval, and traceability. Quality records shall be protected from deterioration, damage, and destruction. The Contractor shall maintain an automated exceptions list of any non-conforming or defective or substandard work.
4. The Contractor shall provide a list with specific records as specified in the Contract Documents which will be furnished to the Engineer at the completion of activities and in conjunction with logs and location drawings.

- N. Acceptance of QA/QC Plan: The Engineer's review and acceptance of the Contractor's QA/QC Plan shall not relieve the Contractor from any of its obligations for the performance of the Work. The Contractor's QA/QC staffing is subject to the Engineer's review and continued acceptance. The City, at its sole option, without cause, may direct the Contractor to remove and replace the

QA/QC representative. No Work covered by the QA/QC Plan shall start until the Engineer's acceptance of Contractor's QA/QC plan has been obtained.

- O. The Engineer may perform independent quality assurance audits to verify that actions specified in Contractor's QA/QC Plan have been implemented. No Engineer audit finding or report shall in any way relieve Contractor from any requirements of this Contract.

## **1.07 TESTING SERVICES**

- A. All tests which require the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing firm acceptable to Engineer. The testing firm's laboratory shall be staffed with experienced technicians, properly equipped and fully qualified to perform the tests in accordance with the specified standards. All standard quality assurance testing and installation verification testing will be at the expense of the Contractor.
- B. Testing, when required, will be in accordance with all pertinent codes and regulations and with procedures and requirements of the American Society for Testing and Materials (ASTM).
- C. The Engineer shall have the right to inspect work performed by the independent testing laboratory both at the project and at the laboratory. This shall include inspection of the manual, equipment calibrations, proficiency sample performance, etc.).
- D. Testing services provided by the City, if any, are for the sole benefit of the City; however, test results shall be available to the Contractor. Testing necessary to satisfy Contractor's internal quality control procedures shall be the sole responsibility of Contractor.
- E. Testing Services Provided by the Contractor
  - 1. Unless otherwise specified, and in conjunction with, all other specified testing requirements, the Contractor shall provide the following testing services, and submit a detailed testing plan for each along with proposed forms for Engineer's review:
  - 2. Moisture-density and relative density tests on embankment, fill, and backfill materials.
  - 3. In-place field density test on embankments, fills and backfill.
  - 4. QC testing of all precast and/or pre-stressed concrete

5. All other tests and engineering data required for the Engineer's review of materials and equipment proposed to be used in the Work
6. In addition, the following QC tests shall be performed by the Contractor:
  - a. Holiday testing of pipeline and all other coatings systems applied to surfaces as required by the Engineer
  - b. Slumps, air bucket tests, compression tests and other confirmation tests
  - c. Air testing of field-welded joints for steel pipe or pipe cylinders and fabricated specials.
  - d. All testing and inspection of welding work including, but not limited to, welding procedure qualifications, welder operator qualifications, all work performed by the certified welding inspector, all appropriate nondestructive testing of welds and all repair and retest of weld defects.
7. Testing, including sampling, shall be performed by the Contractor's testing firm's laboratory personnel, in the manner and frequency indicated in the Specifications. The Engineer shall have the right to stipulate the location of the confirmation tests. The Contractor shall provide preliminary representative samples of materials to be tested, to the testing firm's laboratory, in required quantities.
8. The testing firm's laboratory shall perform all laboratory tests within a reasonable time consistent with the specified standards and will furnish a written report of each test.
9. Where such inspection and testing are to be conducted by an independent laboratory agency, the sample or samples shall be selected by such laboratory or agency or the Engineer and shipped to the laboratory by the Contractor at Contractor's expense.
10. Notify laboratory sufficiently in advance of operation to allow for the assignment of personnel and schedules of tests.

F. Transmittal of Test Reports:

1. Written reports of tests and engineering data furnished by Contractor for Engineer's review of materials and equipment proposed to be used in the Work shall be submitted as specified for Shop Drawings. Final transmittal of all Project testing records will be required as a final close-out submittal for the release of retainage.
2. Promptly process and distribute all required copies of test reports and related instructions to insure all necessary retesting or replacement of materials with the least possible delay in progress of the Work.

**+ + + END OF SECTION 01400 + + +**

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## SECTION 01410

### Testing Laboratory Services

#### PART 1 – GENERAL

##### 1.01 GENERAL

- A. This Section includes testing which the City requires to determine if materials or construction methods provided for the Project meet the requirements of these Specifications.
- B. This work does not include manufacturer testing to demonstrate product compliance with various sections of these Specifications, e.g., testing of pipe material properties. This work also does not include testing of system component functionality, e.g. installed pipes, pump systems, manholes, etc.
- C. The testing laboratory or laboratories will be selected by the City. The testing laboratory or laboratories will work for the City and will be paid by the City through the project Owner Allowance fund.

##### 1.02 PAYMENT FOR TESTING SERVICES

- A. The testing schedule shall be set and coordinated by the Contractor.
- B. The cost of additional material testing services not specifically required in the Specifications, but requested by the City or Engineer, shall be paid for by the City. The Contractor shall accommodate such additional testing and coordinate with the schedule.
- C. The cost of product type testing described in various sections of these Specifications or as required in referenced standards to be provided by a product manufacturer, shall be included in the price bid for that item, and shall not be paid for by the City.
- D. The cost of component functionality testing described in various sections of these Specifications shall be included in the price bid for that item when indicated in Section 01200, e.g., cured-in-place pipe liner sampling and testing, manhole vacuum testing, pipe infiltration/exfiltration testing, etc.
- E. The Contractor will add all testing activities to the project schedule at the beginning of the work. The cost of retesting any item that fails to meet the requirements of these Specifications and/or false starts due to the Contractor's failure to properly schedule testing technicians in accordance with scheduled work shall be paid for by the Contractor. Retesting shall be performed by the testing laboratory working for the City.

### **1.03 LABORATORY DUTIES**

- A. Cooperate with the City, Engineer and Contractor.
- B. Provide qualified personnel promptly on notice.
- C. Perform specified inspections, sampling and testing of materials.
  - 1. Comply with specified standards, ASTM, other recognized authorities, and as specified.
  - 2. Ascertain compliance with requirements of the Contract Documents.
- D. Promptly notify the Engineer and Contractor of irregularity and/or deficiency of work observed during performance of services.
- E. Promptly submit three copies (two copies to the Engineer and one copy to the Contractor) of report of inspections and tests in addition to those additional copies required by the Contractor, with the following information included:
  - 1. Date issued
  - 2. Project title and number
  - 3. Testing laboratory name and address
  - 4. Name and signature of inspector
  - 5. Date of inspection or sampling
  - 6. Record of temperature and weather
  - 7. Date of test
  - 8. Identification of product and Specification section
  - 9. Location of Project
  - 10. Type of inspection or test
  - 11. Results of test
  - 12. Observations regarding compliance with the Contract Documents
- F. Perform additional services as required.

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

#### **1.04 CONTRACTOR RESPONSIBILITIES**

- A. Cooperate with laboratory personnel, and provide access to Work and/or manufacturer's requirements.
- B. Provide to the laboratory, representative samples, in required quantities, of materials to be tested.
- C. Furnish required labor and facilities to:
  - 1. Provide access to Work to be tested
  - 2. Obtain and handle samples at the site
  - 3. Facilitate inspections and tests
  - 4. Furnish and maintain a holding box for concrete cylinders and/ or other samples as required by the laboratory
- D. Notify the laboratory sufficiently in advance of operation to allow for the assignment of personnel and schedules of tests.
- E. Remit payment to the testing laboratory or laboratories when paid or otherwise paid from the Owner Allowance.
- F. Laboratory Tests: Where such inspection and testing are to be conducted by an independent laboratory agency, the sample(s) shall be selected by such laboratory or agency, or the Engineer, and shipped to the laboratory by the Contractor at Contractor's expense.
- G. Copies of all correspondence between the Contractor and testing agencies shall be provided to the Engineer.

#### **1.05 QUALITY ASSURANCE**

- A. Testing shall be in accordance with all pertinent codes and regulations and with procedures and requirements of the American Society for Testing and Materials (ASTM).

#### **1.06 PRODUCT HANDLING**

- A. Promptly process and distribute all required copies of test reports and related instructions to insure all necessary re-testing or replacement of materials with the least possible delay in the progress of the Work.

#### **1.07 FURNISHING MATERIALS**

- A. The Contractor shall be responsible for furnishing all materials necessary for testing.

#### **1.08 CODE COMPLIANCE TESTING**

- A. Inspections and tests required by codes or ordinances or by a plan approval authority, and made by a legally constituted authority, shall be the responsibility of, and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

#### **1.09 CONTRACTOR'S CONVENIENCE TESTING**

- A. Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

#### **1.10 SCHEDULES FOR TESTING**

- A. Establishing Schedule:
  - 1. The Contractor shall, by advance discussion with the testing laboratory selected by the City, determine the time required for the laboratory to perform its tests and to issue each of its findings, and make all arrangements for the testing laboratory to be on site to provide the required testing.
  - 2. Provide all required time within the construction schedule.
- B. When changes of construction schedule are necessary during construction, coordinate all such changes of schedule with the testing laboratory as required.
- C. When the testing laboratory is ready to test according to the determined schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra costs for testing attributable to the delay will be back-charged to the Contractor and shall not be borne by the City.



**1.11 TAKING SPECIMENS**

- A. Unless otherwise provided in the Contract Documents, all specimens and samples for tests will be taken by the testing laboratory or the Engineer.

**1.12 TRANSPORTING SAMPLES**

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

END OF SECTION

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**SECTION 01500**

**Temporary Control of Construction Operations**

**PART 1 – GENERAL**

**1.01 SCOPE**

- A. The work covered by this Section includes furnishing all labor, equipment, and materials required for temporary control of construction operations.

**1.02 RELATED SECTIONS**

- A. The Work of the following Sections specifically apply to the Work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of Work.
  - 1. Section 02112: Route Clearing
  - 2. Section 02125: Erosion and Sediment Controls
  - 3. Section 02140: Dewatering
  - 4. Section 02491: Rehabilitation of Sanitary Sewer Manholes
  - 5. Section 02575: Removing and Replacing Pavement
  - 6. Section 02730: Sewers and Accessories
  - 7. Section 02750: Wastewater Flow Control

**1.03 PUMPING**

- A. The Contractor shall furnish and operate pumping and appurtenant piping for dewatering, flow rerouting, or any similar purposes.
- B. Standard Pumping equipment (as opposed to Reduced Noise Emitting Pumps ex. Quiet Zone, etc.) that could disturb the public shall be operated only during a standard workday or as approved in writing by the Engineer.
- C. No discharge of raw sewage will be permitted to area watercourses under any circumstances. The Contractor shall be held responsible for any such discharge including, but not limited to, fines, legal fees, and any other cost associated with such a discharge.

#### **1.04 TEMPORARY FACILITIES**

- A. The Contractor shall provide all temporary facilities for water, heat, electric light, and power as required for the work during the entire period of operations. Contractor shall be responsible for payment of utility costs for the duration of construction.
- B. The Contractor shall provide temporary toilets as required and shall maintain them in a sanitary condition for the duration of the work and remove them at completion.
- C. On or before the completion of the work, the Contractor shall remove all temporary facilities, together with all rubbish and trash, as directed by the Engineer.

#### **1.05 STORAGE**

- A. The Contractor shall secure adequate storage to accommodate the required equipment, vehicles, and materials for the period of performance of the Contract.

#### **1.06 USE OF PREMISES**

- A. The Contractor shall not load nor permit any part of any structures to be loaded with a weight that will endanger its safety.
- B. The Contractor shall confine his apparatus, the storage of materials and the operations of his workers to the limits defined by laws, ordinances, permits, or directions of the Engineer and shall not unduly encumber the premises with his materials.
- C. The Contractor shall enforce the instructions of the Engineer regarding signs, advertisements, fire and smoking.

#### **1.07 FLOW CONTROLS**

- A. During the entire span of the construction, including inspection, the Contractor shall be responsible to maintain flow in the sewerage system and service to all properties.
- B. Any line plugging or flow restriction shall be with equipment designed specifically for such purpose. A sewer line plug shall be inserted into the line at a manhole upstream from the section being worked on.
- C. Care shall be taken to prevent sewage from backing into buildings, ponding, flooding, or otherwise damaging public or private property.

- D. Controls shall be utilized to prevent sewage from entering surface drainage facilities or water courses, either directly or as a result of overflow from drainage structures.
- E. When bypass pumping is required and ordered by the Engineer, the Contractor shall supply the necessary pumps, conduits, and other equipment to divert the flow of sewage around the manhole section in which work is to be performed into a downstream section. The bypass system shall be of sufficient capacity to handle all existing flows.
- F. No flows shall be diverted from the sewerage system unless a schedule has been approved by the Georgia Environmental Protection Division.
- G. See Specification Section 02750 – Wastewater Flow Control, for additional requirements.

#### **1.08 MAINTENANCE OF EXISTING OPERATION**

- A. The Contractor shall schedule all demolition and construction and maintain continuous operation of the existing wastewater system facilities.
- B. Piping to be abandoned shall be plugged with concrete in a manner approved by the Engineer, so as to be made watertight. All active utilities traversing the site shall be preserved in operating condition.

#### **1.09 MAINTENANCE DURING CONSTRUCTION**

- A. The Contractor shall maintain, at his expense, the work during construction and until final acceptance of all work under the Contract. Continuous and effective work shall be prosecuted day by day, with adequate equipment and forces as required to keep the backfill, pavement, structures, pipe lines and other features in satisfactory and acceptable condition at all times.
- B. In the event the Contractor fails to remedy any unsatisfactory situation, within twenty-four hours after receipt of written notice from the Engineer describing the unsatisfactory conditions, the City may immediately proceed with adequate forces and equipment to maintain the project; and the entire cost of this maintenance will be deducted from the monies otherwise due the Contractor under the Contract.
- C. As an alternative to the above specified maintenance, the cost of all of the items, which are not properly maintained, may be deducted at the Contract Prices from the current partial payment request even if such items have been paid for in previous estimates.

## **1.10 CLEAN-UP AND DISPOSAL**

- A. At the end of each day's operation, the Contractor shall thoroughly clear the work site of all dirt or debris, and generally restore the site to an acceptable condition. Upon completion of the work, all excess material and rubbish shall be removed from the job site and disposed of. The surrounding construction area shall be left in as good a condition as that which existed prior to construction.
- B. The Contractor shall transport and expeditiously dispose of all materials removed from the construction site. Disposal shall be at a site approved by the Engineer at no additional cost to the City and in a manner consistent with all-applicable codes and regulations.

## **1.11 CONSTRUCTION ALONG HIGHWAYS, STREETS, AND ROADWAYS**

- A. Install pipe lines and appurtenances along highways, streets and roadways in accordance with the applicable regulations of, and permits issued by, the Georgia Department of Transportation and City of Atlanta, with reference to construction operations, safety, traffic control, road maintenance and repair.
- B. Traffic Controls:
  - 1. The Contractor shall provide, erect, and maintain all necessary barricades; suitable and sufficient lights and other traffic control devices; provide qualified flagmen where necessary to direct traffic; take all necessary precautions for the protection of the work and the safety of the public. Flagmen shall be certified by a Georgia DOT-approved flagman training program.
  - 2. Construction traffic control devices and their installation shall be in accordance with the current Manual on Uniform Traffic Control Devices for Streets and Highways.
  - 3. Placement and removal of construction traffic control devices shall be coordinated with the Georgia Department of Transportation and City a minimum of 48 hours in advance of the activity.
  - 4. Placement of construction traffic control devices shall be scheduled ahead of associated construction activities. Construction time in street right-of-way shall be conducted to minimize the length of time traffic is disrupted. Construction traffic control devices shall be removed immediately following their useful purpose. Traffic control devices used intermittently, such as "Flagmen Ahead," shall be removed and replaced when needed.

5. Existing traffic control devices within the construction work zone shall be protected from damage. Traffic control devices requiring temporary relocation shall be located as near as possible to their original vertical and horizontal locations. Original locations shall be measured from reference points and recorded in a log prior to relocation. Temporary locations shall provide the same visibility to affected traffic as the original location. Relocated traffic control devices shall be reinstalled in their original locations as soon as practical following construction.
6. Construction traffic control devices shall be maintained in good repair, and shall be clean and visible to affected traffic for daytime and nighttime operation. Traffic control devices affected by the construction work zone shall be inspected daily.
7. Construction warning signs shall be black legend on an orange background. Regulatory signs shall be black legend on a white background. Construction sign panels shall meet the minimum reflective requirements of the Georgia Department of Transportation and City of Atlanta. Sign panels shall be of durable materials capable of maintaining their color, reflective character and legibility during the period of construction.
8. Channelization devices shall be positioned preceding an obstruction at a taper length as required by the current Manual on Uniform Traffic Control Devices for Streets and Highways, as appropriate for the speed limit at that location. Channelization devices shall be patrolled to insure that they are maintained in the proper position throughout their period of use.

C. Construction Operations:

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

5. Construction operations shall include cleanup and utility exploration.
- D. Excavated Materials: Do not place excavated material along highways, streets and roadways in a manner that obstructs traffic. Sweep all scattered excavated material off the pavement in a timely manner.
- E. Drainage Structures: Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.
- F. Landscaping Features: Landscaping features shall include, but are not necessarily limited to, fences, property corners, cultivated trees, and shrubbery, man-made improvements, subdivision signs, and other signs within the right-of-way and easement. The Contractor shall take extreme care in moving landscape features and promptly re-establishing these features.
- G. Maintaining Highways, Streets, Roadways and Driveways:
1. Maintain streets, highways, roadways and driveways in suitable condition for movement of traffic until completion and final acceptance of the work.
  2. During the time period between pavement removal and completing permanent pavement replacement, maintain highways, streets, and roadways by the use of steel running plates. The edges of running plates shall have asphalt placed around their periphery to minimize vehicular impact. The backfill above the pipe shall be compacted, as specified elsewhere up to the existing pavement surface to provide support for the steel running plates.
  3. Furnish a road grader or front-end loader for maintaining highways, streets, and roadways. Make the grader or front-end loader available at all times.
  4. Immediately repair all driveways that are cut or damaged. Maintain them in a suitable condition for use until completion and final acceptance of the work.



## **1.12 ACCESS ROADS**

- A. Streets, road and drives used by the Contractor for access to and from the site of the work shall be protected from damage caused by the normal traffic of vehicles used for or in connection with construction work. Any such damage done shall be repaired immediately and left in good condition at the end of the construction period. Any new access road construction shall be “all weather” and have drainage structures placed as shown or as required.

END OF SECTION

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**SECTION 01540**

**Security and Safety**

**PART 1 – GENERAL**

**1.01 COMPLIANCE WITH CITY’S SECURITY REQUIREMENTS**

- A. Contractor must comply with City’s security requirements for all job sites and Department of Watershed Management (DWM) facilities. The City shall provide copies to the Contractor.
- B. Contractor must cooperate with City on all security matters and must promptly comply with any project security arrangements established by the City.
- C. It is the Contractor’s obligations to comply with all applicable governmental requirements and regulations and to undertake reasonable actions to establish and maintain secure conditions at any jobsite.

**1.02 SECURITY PROGRAM**

- A. The Contractor shall comply with the site security program at all times on City facilities.
- B. The Contractor shall maintain the security program throughout the Contract duration.
- C. The Contractor and his subcontractors are wholly responsible for the security of their employees, work areas, and for all their material, equipment and tools at all times.
- D. The Contractor shall provide the City with a list of 24-hour emergency phone numbers including chain of command.

**1.03 ENTRY CONTROL**

- A. The Contractor shall restrict entry of unauthorized personnel and employees and vehicles onto the Project site.
- B. The Contractor shall allow entry only to authorized persons with proper City-approved identification.
  - 1. All Contractors/Subcontractors will be required to have their personnel working at these facilities photographed for an identification (I.D.) badge before they start work.

## Section 01540 – Security and Safety

- C. The Contractor shall maintain a current Employee Log of employees performing work on site, as well as a Visitor Log, and make the log available to the City upon request. This log shall be available to the City upon request and submitted to the City as necessary.
- D. The Contractor shall require all employees performing activities on site to sign the “Employee Acknowledgment of Project Site Rules Log” included at the end of this Section. All employees, subcontractor employees and lower tier contractor employees will attend a new employee orientation session. Signature of the Employee Log by the employee certifies that the orientation training has been received.
- E. The City has the right to refuse access to the site or request that a person or vehicle be removed from the site if found violating any of the safety, security, or conduct rules as outlined.

**1.04 BARRICADES, LIGHTS AND SIGNALS**

- A. The Contractor shall furnish and erect such barricades, fences, lights, danger signals and other precautionary measures for the protection of persons or property and of the work as necessary.
- B. The Contractor will be held responsible for all damage to the work and any negligence resulting in injuries due to his failure of erecting adequate barricades, signs, lights and safety provisions as required. Whenever evidence is found of such damage, the Contractor shall immediately remove the damaged portion and replace it at the Contractor's cost and expense.
- C. The Contractor's responsibility for the maintenance of barricades, signs and lights shall not cease until the City has been accepted in writing the Project.

**1.05 RESTRICTIONS**

- A. The Contractor shall not allow cameras on site or photographs to be taken, except those that are required to perform the Work in accordance with the Contract Documents or otherwise approved by the City.

**1.06 CONTRACTOR SAFETY/HEALTH AND SECURITY PLAN**

- A. Prior to the performance of any work, the Contractor will prepare and submit a Safety/Health and Security Plan which includes the following minimum requirements:

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1. Basic pre-employment background checks for criminal convictions, veracity of previous employment and education statements, driving record and financial responsibility as applicable to the position.
2. Security Education and Awareness training applicable to the job.
3. Standard operating procedures (SOPs) for safeguarding City equipment, supplies and property.
4. Certification requested under the SAFETY Act, Homeland Security Act of 2002, if applicable. Provide date and result as requested.
5. Established process for identification of employees and emergency notification procedures.
6. If applicable, procedures for entry permits and badges. Procedures for returning badges upon termination of employment.
7. Anti-terrorism training provided to employees including the state of national alert with appropriate procedures.
8. Emergency evacuation procedures including accounting for employees at a safe haven.
9. Procedures for reporting post-contract criminal convictions and traffic accidents to the Contract Officer or DWM project manager.
10. SOPs for protecting employees when performing required duties off-site including training for reporting accidents, calling for immediate assistance, job reporting procedures and personal duress codes or alarms.
11. Contact information for the person(s) responsible for implementation and enforcement of Safety/Health and Security rules and regulations for this contract.
12. Safe work procedures for the activities within the Contractor's scope of work.
13. New employee orientation program, which addresses job and site specific rules, regulations and hazards.
14. The Contractor's Drug Free Work Place Policy including substance abuse prevention and testing program.
15. Provisions to protect all of the Contractor's employees, other persons and organizations that may be affected by the work from injury, damage or loss.

16. Demonstration of compliance with current Fed/OSHA, Safety/Health and Security Plan, facility safety program (when applicable), and locally accepted safety codes, regulations and practices.
  17. A site-specific emergency action and evacuation plan.
  18. Hazard Communication/Right To Know Program.
  19. Security procedures for the Contractor's work, tools, and equipment.
  20. Capability of providing the Engineer with documentation to show compliance with their plan, plus accidents and investigation reports.
  21. Any other contract specific requirements.
- B. It is not the City's responsibility to verify the Contractor's safety plan for the adequacy and compliance of the plan.
- C. Provide a Job Safety Analysis (JSA) for the scope of work, prior to the start of work.
- D. Review of the Contractor's Safety Plan by the City shall not impose any duty or responsibility upon the City for the Contractor's performance of the work in a safe manner.
- E. The Contractor shall be fully responsible for the safety and health of its employees, its subcontractors and lower tier contractors during performance of its work.
- F. The Contractor shall provide the City with all safety reports, training records, competent person list, and accident reports prepared in compliance with Fed/OSHA and the Project Safety/Health and Security Plan as requested.

#### **1.07 PROJECT SAFETY COORDINATOR**

- A. The Contractor shall be responsible for the safety of the Contractor's and Engineer's employees, the City's personnel and all other personnel at the site of the work caused by their operations.
- B. The Contractor shall have a Project Safety Coordinator, as required by Section GC-18 of the General Conditions.

- C. The Project Safety Coordinator shall ensure compliance with all applicable health and safety requirements of all governing legislation.

#### **1.08 PROJECT SAFETY/SECURITY REQUIREMENTS OF THE CONTRACTOR**

- A. It is the responsibility of the Contractor to ensure that all articles of possible personal or monetary value found by Contractor's employees are turned in to the appropriate City Project Manager.
- B. The Contractor shall be responsible for maintaining satisfactory standards of employees' competency, conduct, courtesy, appearance, honesty, and integrity, and shall be responsible for taking such disciplinary action with respect to any employee, as may be necessary.
- C. Should the Contractor dismiss employees who have been given access to DWM facilities while the contract is in force, the Contractor will advise the DWM Security office.
- D. The City may request the Contractor to immediately remove from the premises and/or dismiss any employee found unfit to perform duties due to one or more of the following reasons:
  - 1. Neglect of duty, absenteeism, security or safety problems and sleeping on the job.
  - 2. Disorderly conduct, use of abusive or offensive language, quarreling, intimidation by words or actions or fighting.
  - 3. Theft, vandalism, immoral conduct of any other criminal action.
  - 4. Selling, consuming, possessing, or being under the influence of intoxicants, alcohol, or illegal substances, which produce similar effects while on duty.
  - 5. Vehicle accident while on City property or driving City equipment. No employee, Contractor, or Subcontractor will be extended privileges to drive City equipment on City property if driving privileges have been withdrawn by the State of residence.
- E. All employees shall be required to sign in and out on a designated log sheet.
- F. All employees shall be required to wear at all times in an observable location, above the waist, on outer clothing, appropriate photo I. D. badges to be furnished by the Contractor and approved by the City.

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

#### **1.09 EMPLOYEE ACKNOWLEDGEMENT OF THE PROJECT SITE RULES**

- A. All employees and agents of the Contractor must read and sign a form to acknowledge understanding of project site rules. A sample log is attached to this Section.
- B. By Signing this Employee Log, I acknowledge that I understand and agree to abide by the project rules outlined below. I further acknowledge that I have been briefed on specific hazards, hazardous substances that are on-site and the site emergency action procedure.
- C. PROHIBITED ACTIVITIES:
1. Unauthorized removal or theft of CITY property
  2. Violation of safety or security rules or procedures
  3. Possession of firearms or lethal weapons on jobsite
  4. Acts of sabotage
  5. Destruction or defacing CITY property
  6. Failure to use sanitary facilities
  7. Failure to report accidents or job related injuries
  8. Being under the apparent influence of drugs, alcohol or other intoxicants or in possession of drugs, alcohol or other intoxicants on the property
  9. Wearing shorts or tennis shoes on the jobsite
  10. Failure to wear a hardhat/safety glasses as required by law.
  11. Gambling at any time on the project
  12. Fighting, threatening behavior, or engaging in horseplay on the project
  13. Smoking in unauthorized areas on the project
  14. Open fire cooking or making unauthorized fires on project property
  15. Selling items or raffles without authorization
  16. Use of unauthorized cameras on the project
  17. Use of radio or television in the construction area
  18. Failure to park personal vehicle in authorized parking area
  19. Failure to wear designated identification [Site Specific]
  20. Failure to use designated gates
  21. Use or storage of unauthorized chemicals or substances on site.
- D. I have read, understand and agree to abide by the PROJECT SITE RULES. Furthermore, I understand failure to abide by these rules is



grounds for being denied access to the project site. I have received a personal copy for my use and reference.

#### **1.10 OFFICE, MATERIAL AND EQUIPMENT SECURITY**

- A. The Contractor is solely responsible for the security of any offices or any temporary staging areas utilized by the Contractor. The Contractor is also responsible for the security of his materials, tools, vehicles and equipment on-site at all of the various work locations throughout the City.

## EMPLOYEE LOG

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

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

**VISITOR LOG**

BY THE SIGNING OF THIS LOG I ACKNOWLEDGE THAT I HAVE READ,  
UNDERSTAND AND AGREE TO ABIDE BY THE PROJECT RULES OUTLINE  
ABOVE. THIS IS NOT FOR A VEHICLE ACCESS PERMIT.

VISITOR'S NAME PRINT	SIGNATURE	COMPANY VISITED	DATE	IN	OUT

END OF SECTION

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## SECTION 01580

### Project Identification and Signs

#### PART 1 – GENERAL

##### 1.01 SCOPE

- A. The work under this Section requires the Contractor to furnish, utilize and maintain project signage and custom vinyl magnetic vehicle signs throughout the duration of the project.

##### 1.02 DESIGN

- A. The Contractor shall submit to the Engineer for approval a scale drawing showing the graphic design, style of lettering, and colors, configured to match the design issued by the City Public Involvement (PI) Office. The PMT and/or PI Office will provide the art ready templates for all CWA signage at the Public Information Kick-off Meeting described in Section 01351.

#### PART 2 – PRODUCTS

##### 2.01 MATERIALS

- A. Project Signs
  - 1. All building and graphic materials shall be exterior grade and suitable for environmental exposure without any visible fading, warping or delaminating.
  - 2. All lumber shall be pressure treated number 2 grade with a minimum of 0.25 pounds per cubic foot wood preservative.
  - 3. All fasteners shall be hot dip galvanized.
  - 4. Each project sign shall be painted white with color sign graphic as indicated on Attachment 1.
  - 5. The minimum sign size shall be 96 inches wide by 48 inches high.
- B. Magnetic Vehicle Signs
  - 1. Each sign shall be durable nylon having a 100% magnetic surface with strong magnetic cling.

2. The minimum sign size shall be 24 inches wide by 12 inches high.
3. The magnetic sign graphic shall have a professional appearance with fade resistant color printed layout.

C. Yard Signs

1. Yard signboards shall be made of corrugated plastic panel suitable for exterior use with color graphic print on both sides.
2. Each signboard shall be securely attached to a single metal wire stand frame. The wire frame shall be zinc coated or galvanized surface to resist corrosion.
3. The minimum sign size shall be 36 inches wide by 24 inches high.

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

A. Project Signs

1. The Contractor shall construct each project signboard to accommodate the minimum dimensions per Attachment 1 herein.
2. Each sign shall have a minimum of two end post securely anchored to a minimum depth of 2 feet below grade. Each post shall be sufficient length to provide a finished bottom edge signboard elevation 4 feet above grade without splices or other wood joints unless otherwise directed by the City.
3. All fasteners shall be flush with surface with smooth wood edges in a constructed in a neat manner free of irregular cuts, tear out or other undesirable visible defects.
4. The project sign shall be located at the project entrance as directed by the City Public Information officer.

B. Magnetic Vehicle Signs

1. Contractor shall utilize the magnetic signs for all vehicles performing work under this Contract while the vehicles are on the site or otherwise engaged in the Contract Work.
2. Contractor shall place the magnetic signs on each vehicle in a high visibility location. If the signs are to be placed on the sides of

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Section 01580 – Project Identification and Signs

vehicles, two signs shall be utilized per vehicle (one sign per side). If the signs are to be placed on the rears of vehicles, one sign per vehicle shall be acceptable.

3. Contractor shall replace the signs during the project as necessary or as directed by the Engineer.

B. Yard Signs

1. Contractor shall install and maintain yard signs as directed by the City Public Information Officer (PIO).

**3.02 MAINTENANCE**

- A. Contractor shall periodically inspect and maintain all signage in good condition throughout the Contract period at no additional cost to the City.

END OF SECTION

**96"**

<b>Atlanta City Council</b>		 <div style="display: inline-block; vertical-align: middle;"> <p><b>CITY OF ATLANTA DEPARTMENT OF</b>  <b>watershed</b>  <b>management</b></p> <p><b>Kasim Reed, Mayor</b></p> <p style="font-size: 2em; font-weight: bold;">Project Name Goes Here</p> <p><b>Cost: \$0.00</b></p> <p><b>DWM Project Hotline Number: 404-546-0311</b></p> <p><a href="http://www.atlantawatershed.org">www.atlantawatershed.org</a>   <a href="https://facebook.com/atlwatershed">facebook.com/atlwatershed</a>   <a href="https://twitter.com/atlwatershed">twitter.com/atlwatershed</a></p> </div>
<p><b>Cesar C. Mitchell</b>    <b>Council President</b></p> <p>Carla Smith    District 1</p> <p>Kwanza Hall    District 2</p> <p>Ivory Lee Young, Jr.    District 3</p> <p>Clela Winslow    District 4</p> <p>Natalyn Mosby Archibong    District 5</p> <p>Alex Wan    District 6</p> <p>Howard Shook    District 7</p> <p>Yolanda Adrean    District 8</p> <p>Felicia A. Moore    District 9</p> <p>C.T. Martin    District 10</p> <p>Keisha Lance Bottoms    District 11</p> <p>Joyce Shepherd    District 12</p> <p>Michael Julian Bond    Post 1 At-Large</p> <p>Mary Norwood    Post 2 At-Large</p> <p>Andre Dickens    Post 3 At-Large</p>	<p><b>Department of Watershed Management</b>  <b>Kishia L. Powell</b>  <b>Commissioner</b></p>	

**48"**

Department of Watershed Management | A Project of the Five-Year Capital Improvement Plan

END SECTION



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**SECTION 01590****Field Offices****PART 1 - GENERAL****1.01 SCOPE**

- A. The Contractor shall provide all temporary facilities and necessary staff personnel for the proper completion of the Work as specified.
- B. Maintain temporary facilities in proper and safe condition through the progress of the Work. In the event of loss or damage, immediately make all repairs and replacements necessary subject to approval of the Engineer and at no additional cost to City. At completion of the Work remove all such temporary facilities or as directed by the Engineer.

**1.02 REQUIREMENTS**

- A. General
  - 1. The materials, equipment, and furnishings provided under this Section shall be new, and shall meet all the applicable codes and regulations.
  - 2. Make all provisions, and pay all costs of furnishing, installation, maintenance, professional services, permit fees, property leases, and site work including all utilities for the temporary facilities.
- B. Field Personnel
  - 1. The Contractor's administrative field office shall be maintained at a staffing level sufficient to plan, coordinate and have authority to promptly execute the Work on site with the corresponding City personnel. At a minimum, the Contractor's project manager, public information officer, safety officer, superintendent and one administrative support person shall occupy and be available at the field office each workday.
- C. Field Office Construction
  - 1. Temporary mobile/modular field office buildings shall be structurally sound, weather tight, with floors raised above ground. Mobile/modular buildings shall comply with GA-DCA/SBCC/ADA requirements, and shall be G E – Modular Space, Williams-Scottsman or equal.

2. Temporary field office buildings shall have temperature transmission resistance compatible with occupancy and storage requirements. The office buildings shall be properly skirted as approved by the Engineer.

### **1.03 CONTRACTOR'S FACILITIES**

- A. Contractor shall submit a plan of the temporary field office building layout to Engineer for approval within 15 days of the Notice to Proceed. Contractor's facilities, for purposes of this Section, is defined to include but is not limited to its administrative field office located within a five (5) mile radius of the project site. The field office shall have a first aid station and be centrally located to the Work. The Contractor's operational field office shall have a storage facility (for both materials and equipment). Insufficient, inadequate, improper facilities or equipment shall be brought to acceptable condition or shall be removed from either site.
- B. The Contractor's administrative field office shall include a dedicated meeting/conference room for hosting bi-weekly progress or other meetings with City and Engineer representatives. Size the room to comfortably seat a minimum of ten (10) people. Proper ventilation, temperature control and lighting are required, and shall be provided to the satisfaction of the Engineer.
- C. The location of stationary and mobile equipment shall be subject to the Engineer's approval.
- D. First Aid Station: Contractor shall provide a suitable first aid station at the administrative field office and the Contractor's operational field office. Each station shall be equipped with all facilities and medical supplies necessary to administer emergency first aid treatment. Contractor shall have standing arrangements for the removal and hospital treatment of any injured person. The information reflecting this arrangement shall be clearly posted for easy visibility. All first aid supplies and emergency ambulance service shall be made available by the Contractor to the Contractor's, City's and Engineer's personnel.

### **1.04 ENGINEER'S FACILITIES (Not Used)**

### **1.05 COMMUNICATIONS SERVICES**

- A. General
  1. Make all necessary arrangements for outside telephone and internet access service to Contractor's administrative field office and Contractor's operational field office. All portions of the communication system shall be maintained in good working

condition.

2. At a minimum, furnish two telephone lines to the Contractor's administrative field office and Contractor's operational field office. One will be used for a dedicated facsimile machine.
3. All expenditures for installation costs of hardware, lines, line extensions, service charges, and recurring service charges for telephone and internet access service shall be included in the unit price for the Contractor's temporary facilities item.

## **1.06 PARKING FACILITIES**

### **A. General**

1. Provide parking, either graveled or paved, adjacent to Contractor's administrative field office and Contractor's operational field office, without necessitating jockeying of cars, for a minimum of 2 cars for the use of City's or Engineer's personnel when visiting the Contractor's administrative field office or Contractor's operational field office. The parking surfaces shall be promptly and adequately maintained by the Contractor for the duration of the Contract.
2. Additional parking facilities required by the Contractor shall be the Contractor's responsibility.

## **1.07 FACILITIES FOR PROJECT CONTROL TOOLS**

- A. The Contractor shall have adequate computer system capability in its administrative field office and Contractor's operational field office facilities to connect to and use the City's Project Control Tools (refer to Section 01350). The connection method shall be based upon the physical connections availability at the various field and office locations. The priority preference for these connections is: DSL, Cable Modems, and if necessary T1 connections. No dial-up modems will be allowed. The monthly charges for these services shall be paid by the Contractor for the duration of the contract. Costs shall be included in the unit price item for the Contractor's temporary facilities.
- B. The Contractor's connection computer(s) must have a minimum operating system of Windows 2000 or greater, 1.8 Hz speed with 256mb RAM. The Internet Explorer web browser must be version 5.5 or greater. The Contractor's printers must not be USB connection printers. The printer(s) must be a dedicated printer, HP LaserJet compatible.

- C. No partial payment for the Contractor's temporary facilities unit price item will be approved until all connections are provided and installed to the satisfaction of the City's Project Controls Support Group.

## **1.08 SECURITY AND MAINTENANCE**

### **A. General**

1. Provide periodic indoor and outdoor maintenance and cleaning for temporary structures, furnishings, equipment and services as specified herein above.
2. Provide racks and files for Project Record Documents to be turned over to the City at the completion of the project.

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Fill and grade sites for temporary structures to provide surface drainage.

### **3.02 INSTALLATION**

- A. Construct temporary administrative field office, Contractor's operational field office, first aid station, and storage facilities on proper foundations and complete connections for utility all services.
- B. Locate temporary administrative field office facilities at an Area Compound location provided by the City and locate Contractor's operational field office within a five (5) mile radius of the administrative field office Area Compound, as approved by the Engineer.
- C. Determine the need for temporary utility services, including utility services for Contractor's administrative field office, Contractor's operational field office and first aid station, and make all arrangements with utility companies and governmental agencies to secure such services. Temporary utility services shall be furnished, installed, connected, and maintained by Contractor in a workmanlike manner, and shall be removed in like manner prior to final project acceptance.

### **3.03 MAINTENANCE AND CLEANING**

- A. At a minimum, repair and clean the offices, parking areas and access routes and provide complete professional janitorial services, including toilet paper and paper towels, in the Contractor's administrative field office

and Contractor's operational field office. Contractor's administrative field office and Contractor's operational field office cleaning shall be done to the satisfaction of the Engineer. These services shall include sweeping, vacuuming, dusting, emptying of trash, cleaning of washbasins, bathroom and shower facilities, mopping and waxing of all floors. Contractor shall also provide for exterminating services of the offices if requested by the Engineer.

### **3.04 REMOVAL**

- A. Remove or discontinue temporary field offices, contents and services at a time when no longer needed.

END OF SECTION

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**SECTION 01610**

**TRANSPORTATION AND HANDLING**

**PART 1 – GENERAL**

**1.01 SCOPE**

- A. The Contractor shall provide transportation of all equipment, materials, and products furnished under these Contract Documents to the Work site. In addition, the Contractor shall provide preparation for shipment, loading, unloading, handling and preparation for installation and all other work and incidental items necessary or convenient to the Contractor for the satisfactory prosecution and completion of the Work.
- B. All equipment, materials, and products damaged during transportation or handling shall be repaired or replaced, prior to being incorporated into the Work, by the Contractor at no additional cost to the City

**1.02 TRANSPORTATION**

- A. All equipment shall be suitably boxed, crated, or otherwise protected during transportation.
- B. Where equipment will be installed using existing cranes or hoisting equipment, the Contractor shall ensure that the weights of the assembled sections do not exceed the capacity of the cranes or hoisting equipment.
- C. Small items and appurtenances such as gauges, valves, switches, instruments, and probes that could be damaged during shipment shall be removed from the equipment prior to shipment, packaged, and shipped separately. All openings shall be plugged or sealed to prevent the entrance of water or dirt.

**1.03 HANDLING**

- A. All equipment, materials, and products shall be carefully handled to prevent damage or excessive deflections during unloading or transportation.
- B. Lifting and handling drawings and instructions furnished by the manufacturer or supplier shall be strictly followed. Eyebolts or lifting lugs furnished on the equipment shall be used in handling the equipment. Shafts and operating mechanisms shall not be used as lifting points. Spreader bars or lifting beams shall be used when the distance between lifting points exceeds that permitted by standard industry practice.

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Section 01610 – Transportation and Handling

- C. Under no circumstances shall equipment or products such as pipe, structural steel, castings, reinforcement, lumber, piles, poles, etc., be thrown or rolled off of trucks onto the ground.
- D. Slings and chains shall be padded as required to prevent damage to protective coatings and finishes.

END OF SECTION

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## SECTION 01611

### Storage and Protection

#### PART 1 – GENERAL

##### 1.01 SCOPE

- A. The work under this Section includes, but is not necessarily limited to, the furnishing of all labor, tools and materials necessary to properly store and protect all materials, equipment, products and the like, as necessary for the proper and complete performance of the Work.
- B. The Contractor shall store materials, supplies, and equipment at the site in such orderly fashion and in such locations as approved by the Engineer that will not unduly interfere with the progress of the Work or the work of any other contractors, or the activities of City personnel.

##### 1.02 STORAGE AND PROTECTION

- A. Storage:
  - 1. Maintain ample space for foot traffic at all times, except as otherwise approved by the Engineer.
  - 2. All property damaged by reason of storing of material shall be properly replaced at no additional cost to the City.
  - 3. Packaged materials shall be delivered in original unopened containers and so stored until ready for use.
  - 4. All materials shall meet the requirements of these Specifications at the time that they are used in the Work.
  - 5. Store products in accordance with manufacturer's instructions.
- B. Protection:
  - 1. Use all means necessary to protect the materials, equipment, and products of every section before, during and after installation and to protect the installed work and materials of all other trades.
  - 2. All materials shall be delivered, stored, and handled to prevent the inclusion of foreign materials and damage by water, breakage, vandalism, or other causes.



Section 01611 – Storage and Protection

3. Substantially constructed weathertight storage sheds, with raised floors, shall be provided, and maintained as may be required to adequately protect those materials and products, which may require protection from damage by the elements, stored on the site.
- C. Replacements: In the event of damage, immediately make all repairs and replacements necessary for the approval of the Engineer and at no additional cost to the City.
  - D. Equipment and products stored outdoors shall be supported above the ground on suitable wooden blocks or braces arranged to prevent excessive deflection or bending between supports. Items such as pipe, structural steel and sheet construction products shall be stored with one end elevated to facilitate drainage.
  - E. Unless otherwise permitted in writing by the Engineer, building products, and materials such as cement, grout, plaster, gypsum board, particleboard, resilient flooring, acoustical tile, paneling, finish lumber, insulation, wiring, etc., shall be stored indoors in a dry location. Building products such as rough lumber, plywood, concrete block, and structural tile may be stored outdoors under a properly secured waterproof covering.
  - F. Tarps and other coverings shall be supported above the stored equipment or materials on wooden strips to provide ventilation under the cover and minimize condensation. Tarps and covers shall be arranged to prevent ponding of water.

### 1.03 EXTENDED STORAGE

- A. In the event that certain items of major equipment such as air compressors, pumps, and mechanical aerators have to be stored for an extended period of time, the Contractor shall provide satisfactory long-term storage facilities that are acceptable to the Engineer. The Contractor shall provide all special packaging, protective coverings, protective coatings, power, nitrogen purge, desiccants, lubricants, and exercising necessary or recommended by the manufacturer to properly maintain and protect the equipment during the period of extended storage.

END OF SECTION

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**SECTION 01720****Record Documents****PART 1 – GENERAL****1.01 SCOPE**

- A. The work under this Section includes, but is not necessarily limited to, the compiling, maintaining, recording, and submitting of project record documents as herein specified.
- B. Record documents include, but are not limited to:
  - 1. Drawings
  - 2. Specifications
  - 3. Change orders and other modifications to the Contract
  - 4. Engineer field orders or written instructions, including Requests for Information (RFI) and Clarification Memorandums
  - 5. Reviewed shop drawings, product data and samples
  - 6. Test records
  - 7. As-built drawings and/or maps, indicating the locations and types of work performed (manhole asset ID numbers clearly shown where appropriate). Position survey coordinates, top of manhole and invert elevations shall be indicated on the drawing for all manholes and/or sewers which are newly constructed, replaced or adjusted to grade. Where service laterals are rehabilitated or replaced (whether partial or complete to property line) indicate approximate location on drawing, as well as method of rehabilitation/repair. As-built pipe diameters and materials shall also be indicated.
  - 8. Map corrections - printed map marked up illustrating the approximate position of any unmapped manholes and sewers discovered (no survey required).
  - 9. Geographic Information System (GIS) data – updated GIS data set indicating the as-built position and attributes for all replaced and rehabilitated sewer mains, manholes and lateral piping.
- C. The Contractor shall maintain a current set of Record Drawings and GIS data on the Project site throughout the Contract Time.

## 1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

### A. Storage:

1. Store documents and samples in the Contractor's field office, apart from documents used for construction
2. Provide files and racks for storage of documents
3. Provide locked cabinet or secure storage space for storage of samples

### B. File documents and samples in accordance with format of these Specifications

### C. Maintenance:

1. Maintain documents in a clean, dry, legible condition and in good order.
2. Do not use record documents for construction purposes.
3. Maintain one copy of all record documents at the site.

### D. Make documents and samples available at all times for inspection by Engineer.

### E. Failure to maintain the Record Documents in a satisfactory manner may be cause for withholding payment.

## 1.03 QUALITY ASSURANCE

### A. Unless noted otherwise, Record Drawings and corresponding GIS data shall provide dimensions, distances, coordinates to the nearest 0.1 foot in North American Datum of 1983 (1986 adjustment) Georgia State Plane West 1002 System format. All coordinate values shall be provided as grid coordinates in US Survey Feet.

### B. Unless noted otherwise, Record Drawings and corresponding GIS data shall provide elevations to the nearest 0.01 foot referenced to the North American Vertical Datum of 1988 (NAVD88) format. All coordinate values shall be provided as grid coordinates in US Survey Feet.

### C. GPS data shall be collected using eGPS Solutions or equivalent internet-based real time GPS network. The network shall provide continuous error

correction and accuracy which meets or exceeds the requirements of Section 1.07 Data Accuracy.

- D. Any transformation or adjustment necessary to reproject surveyed coordinates to the Reference Coordinate System will be the responsibility of the Contractor.
- E. The Contractor shall employ a Professional Land Surveyor (PLS) licensed in the State of Georgia to prepare the Record Drawings from a post-construction, field survey of all manholes or sewers newly constructed, replaced or otherwise adjusted in position or elevation. Additionally, the contractor shall submit the corresponding GIS data accordingly to indicate the as-built condition and GIS data attributes of these structures and pipelines.

#### **1.04 DATA ACCURACY**

- A. High Resolution: For all sanitary sewer structures, the equipment and means used by Contractor must generate the position of points with a minimum accuracy of three (3) centimeters horizontal and three (3) centimeters vertical. To determine the accuracy obtained, Contractor's GPS system will be calibrated daily against a known point (monuments) prior to beginning work and when the work is completed. The Contractor shall submit a report to the Engineer certifying calibration was accomplished and indicating the reference system. Data delivered to the Engineer arising from the GPS survey shall be certified by a Professional Land Surveyor. When the GPS equipment cannot be set directly on the point, conventional surveying methods will be used to establish the position to the stated level of accuracy.
- B. Calibration shall be carried out at least on a daily basis in accordance with the GPS equipment manufacturer's instructions. Additional calibrations may be required during the course of the working day for large fluctuations of temperature and/or humidity, also in accordance with the manufacturer's instructions and tolerances. The Contractor shall submit a report to the Engineer certifying calibration was accomplished and indicating the reference system.

#### **1.05 INTERFERENCE**

- A. A GPS position is required for all newly constructed, replaced or adjusted sanitary point structures regardless of the overhead conditions or other nearby obstructions which may interfere with satellite signals, at no additional cost. In the event coverage conditions do not allow all positions to be obtained by setting directly over the point, rangefinders or other conventional surveying methods may be used to obtain the position of the point(s).

## 1.06 RECORDING

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

## 1.07 RECORD DRAWINGS

- A. Record Drawings shall be reproducible, shall have a title block indicating that the drawings are Record Drawings, the name of the company preparing the Record Drawings, and the date the Record Drawings were prepared. The Contractor will be provided paper sepias of the Drawings, or it may elect to provide reproducible drawings via another method. Reproducible shall be defined as being translucent so as to allow a blueline print to be produced.
- B. Legibly mark drawings to record actual construction, including:
  - 1. All Construction:
    - a. Changes of dimension, diameter, or material and detail
    - b. Location and type of work performed on each manhole or sewer segment (indicate asset ID numbers)
    - c. Changes made by Requests for Information (RFI), field order, clarification memorandums or by change order
    - d. Details not on original Drawings
    - e. The distance (length) between manhole covers on pipe segments where work was performed.
  - 2. Structures:
    - a. Position coordinates, as well as invert and top elevations of manholes where manholes or sewers have been newly constructed, replaced or adjusted/raised to grade.

**1.08 SPECIFICATIONS**

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

**1.09 GIS DATA**

- A. Coordinate and attribute data shall be provided in both electronic and hard copy format at the completion of each sewer-shed, but not less than monthly. The hard copy data must be submitted for approval by the Engineer. Electronic data will not be accepted without hard copy data. Each submittal must be numbered according to the numbering system outlined in Specification Section 01350.
- B. The hard copy data shall include a cover letter and printed spreadsheet that corresponds to the electronic data submitted. If the survey work is performed by a subcontractor, the cover letter shall provide certification of data accuracy by a Professional Land Surveyor (PLS) licensed in the State of Georgia. If the survey work is performed by the prime Contractor, the cover letter shall provide certification of data accuracy by a Professional Land Surveyor (PLS) licensed in any State in the United States of America. The hard copy data must be bound, with the PLS seal placed on the cover letter; OR, the hard copy data may be submitted unbound, with the PLS seal placed on each and every sheet of unbound data submitted.
- C. The attached GPS Certification Form shall be signed and sealed by a Registered Land Surveyor in Georgia and submitted for each sewershed.
- D. The electronic data table submittal shall include four completed worksheets to form a workbook in Microsoft Excel format containing position survey data and physical attributes of the replacement and rehabilitation work. All pipe material, pipe shape and pipe liner code values shall be provided in accordance with in Section 02752 - Attachment C. Numerical value measurement data precision shall be 1/1000 or three decimal places. Each data worksheet shall include individual data records arranged in template formats and header values conforming to examples provided below;

**Manhole Replacement or Rehabilitation Worksheet:**

PointGISID	X_Coord_US	Y_Coord_US	Z_Elev_US	REHAB_METH	Comments	Install Date	Scope Status
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## Section 01720 – Record Documents

23040113201	2204663.500	1349506.320	859.950	Replace MH Frame and Cover	Replaced Vented Cover & Installed Solid Cover	mm/dd/yyyy	Original scope completed as designed

**Pipeline Rehabilitation Worksheet (Use for sewer main open cut replacement, pipe-bursting, push-bursting, horizontal directional drilling or lining):**

PipeGISID	PipeDia	PipeWidth	PipeHeight	PipeGuage	PipeShape	PipeUSDpth	PipeDSDpth
23040113201T23040116501	12.000	0.000	0.000	1.125	C	8.600	15.840

Cont'd

PipeMatl	X_Coord_US	Y_Coord_US	Z_Elev_US	US_Pipe_Elev	X_Coord_DS	Y_Coord_DS	Z_Elev_DS
PE	2204663.500	1349506.320	859.950	851.350	2204313.580	1349469.870	864.350

Cont'd

DS_Pipe_Elev	Length	Slope	REHAB_METH	COMMENTS	Install Date	Scope Status
848.510	351.813	0.008072	PB		mm/dd/yyyy	Original Scope completed as designed

**Point Repair Rehabilitation Worksheet:**

PipeGISID	PipeDia	PipeWidth	PipeHeight	PipeGuage	PipeShape	PipeMatl
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## Section 01720 – Record Documents

23040113201T23040116501	12.000	0.000	0.000	1.125	C	VC
23040113301T23040113401	0.000	8.000	10.000	0.000	C	CO

Cont'd

REHAB_METH	DISTFRMUSMH	PR_LENGTH	PR_MATERIAL	COMMENTS	Install Date	Scope Status
External	12.700	4.500	VC		mm/dd/yyyy	Rehab scope method revised from original scope
Internal	13.000	6.000	PVC		mm/dd/yyyy	Original scope completed as designed

**Lateral Rehabilitation Worksheet:**

PipeGISID	Addresses	ZIP	Pipe Matl	DIST FRM USMH	Clock Pos	REHAB METH	New CO	Comments	Install Date	Scope Status
23040113201T23040116501	31 Honour Circle, NE	30305	PVC	189.000	9.000	REP	N		mm/dd/yyyy	Work added to original scope
23040113301T23040113401	400 Atlanta Avenue, SW	30309	CPP	13.000	3.000	Lining	Y		mm/dd/yyyy	Original scope completed as designed
13040113901T13044011801	230 Peachtree Street, NE	30303	CPP	89.000	9.000	Top Hat	N		mm/dd/yyyy	Original scope completed as designed

**1.08 SUBMITTAL**

- A. At work assignment or contract closeout (whichever comes first), the Contractor shall submit two copies of Record Documents to the Engineer.



- B. The submittal shall include a transmittal letter, in duplicate, containing:
1. date
  2. project title and number
  3. contractor's name and address
  4. title and number of each record document and
  5. signature of Contractor or Contractor's authorized representative.
- C. Additionally, the Contractor shall edit the digital PDF(s) files furnished for each sewershed to include all changes based upon actual field conditions. The Contractor shall submit marked up map(s) showing the position of unmapped and incorrectly positioned manhole(s) and/or pipelines discovered during the work. All map(s) shall be marked up with red text and delivered to the Engineer upon the completion of each sewershed. Supplemental sketches shall also be provided in red text, as necessary to clearly depict the actual site conditions including, but not limited to congested areas and established access roads. A legend shall be added to the title block indicating the symbology, color coding and descriptions. The date, the words "As-Built" and company name shall also be included in the title block.

END OF SECTION

**ATTACHMENT A**


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**GPS CERTIFICATION FORM**


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The purpose of this form is to provide the City of Atlanta with additional GPS/Survey information necessary to maintain the GIS system. This form should be completed for each sewershed and submitted with the Certified GPS.

Name of Sewershed:	Contractor Name:	Surveyor Name:
	Contact Number:	Contact Number:
Brief description of survey equipment used: (Manufacturer, Model No., Age)		
Reference Coordinate System used		
a. Horizontal		
<ul style="list-style-type: none"> <li>• Datum _____</li> <li>• Adjustment _____</li> <li>• Coordinate System _____</li> <li>• Unit of Measure _____</li> </ul>		
b. Vertical		
<ul style="list-style-type: none"> <li>• Datum _____</li> <li>• Geoid Model _____</li> <li>• Unit of Measure _____</li> </ul>		
c. Geodetic monuments used or name of network RTK service _____		
d. Scale factors for Conventional Survey _____		
e. If calibration or transformation was applied, list parameters _____		
f. Are coordinates Grid or Ground? _____		

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 Signature and Seal of Surveyor

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 Date

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**SECTION 02000**

**SITE WORK**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. This section outlines site work requirements that are applicable to all site work operations. Refer to specification sections for specific product and execution requirements.

**1.02 QUALITY ASSURANCE**

- A. Comply with all applicable local, state, and federal requirements regarding materials, methods of work, and disposal of excess and waste materials.
- B. Obtain and pay for all required inspections, permits, and fees. Provide notices required by governmental authorities.

**1.03 PROJECT CONDITIONS**

- A. Locate and identify existing underground and overhead services and utilities within contract limit work areas. Provide adequate means of protection of utilities and services designated to remain. Repair utilities damaged during site work operations at Contractor's expense.
- B. Arrange for disconnection or disconnect and seal or cap all utilities and services designated to be removed before start of site work operations. Perform all work in accordance with the requirements of the applicable utility company or agency involved.
- C. When uncharted or incorrectly charted underground piping or other utilities and services are encountered during site work operations, notify the Engineer and the applicable utility company immediately to obtain procedure directions. Cooperate with the applicable utility company in maintaining active services in operation.
- D. Locate, protect, and maintain bench marks, monuments, control points and project engineering reference points. Reestablish disturbed or destroyed items at Contractor's expense.
- E. Perform site work operations and the removal of debris and waste materials to assure minimum interference with streets, walks, and other adjacent facilities.

- F. Obtain governing authorities' written permission when required to close or obstruct street, walks and adjacent facilities. Provide alternate routes around closed or obstructed traffic ways when required by governing authorities.
- G. Control dust caused by work. Dampen surfaces as required. Comply with pollution control regulations of governing authorities.
- H. Protect existing buildings, paving, and other services or facilities on site and adjacent to the site from damage caused by site work operations. Cost of repair and restoration of damaged items at Contractor's expense.
- I. Protect and maintain street lights, utility poles and services, traffic signal control boxes, curb boxes, valves and other services, except items designated for removal. Remove or coordinate the removal of traffic signs, parking meters and postal mail boxes with the applicable governmental agency. Provide for temporary relocation when required to maintain facilities and services in operation during construction work.
- J. Preserve from injury or defacement all vegetation and objects designated to remain.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS AND EQUIPMENT**

- A. Materials and equipment: As selected by Contractor, except as indicated in contract documents.

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. Examine the areas and conditions under which site work is performed. Do not proceed with the work until unsatisfactory conditions are corrected.
- B. Consult the records and drawings of adjacent work and of existing services and utilities which may affect site work operations.

**+ + + END OF SECTION 02000 + + +**

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## SECTION 02112

### Route Clearing

#### PART 1 – GENERAL

##### 1.01 SCOPE

- A. The extent of route clearing is that minimum degree of clearing necessary to carry out construction activities such as pipe bursting, pipe repairs and other pipeline renewal processes including construction of appurtenances, as well as other additional clearing needed for access purposes.
- B. The Contractor shall endeavor to minimize disruption to the neighborhood and shall adjust route-clearing plans to avoid important landscaping features where practicable.
- C. Route clearing operations include, but are not limited to, the following:
  - 1. All coordination, permitting, plan development and submittals, and other associated items in accordance with the City of Atlanta's Tree Protection Ordinance and Greenway requirements.
  - 2. Notification of the One Call Center for location and marking of existing utilities within the work zone
  - 3. Erosion control of disturbed areas
  - 4. Protecting trees, plants, buffers, and above-grade and underground improvements
  - 5. Removal and disposal of debris, trees and other vegetation
  - 6. Clearing
  - 7. Removing above-grade improvements
  - 8. Removing underground improvements
  - 9. Restoring damaged improvements

##### 1.02 QUALITY ASSURANCE

- A. The Contractor shall comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, state or federal authorities having jurisdiction over the Project. All required permits of a temporary nature,

including coordination with local officials, plans development and approval, submittals, etc., shall be obtained for construction operations by the Contractor.

- B. Burning of cleared materials on site is not permitted. The Contractor shall allow in rates for complete removal of all material arising from any necessary clearing and grubbing.
- C. Protection of Existing Improvements:
  - 1. Provide barricades, coverings, or other types of protection necessary to prevent unnecessary damage to existing improvements.
  - 2. Protect improvements on adjoining properties as well as those on the project site. Restore improvements damaged by this work to their original condition, as acceptable to the Owners or other parties or authorities having jurisdiction. Replace property line monuments (such as iron pins) removed or disturbed by clearing operations. This work shall be performed by a Land Surveyor licensed in the State of Georgia.
- D. Protection of Existing Trees and Vegetation:
  - 1. Protect existing trees and other vegetation against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip lines, excess foot or vehicular traffic, or parking of vehicles or equipment within drip line. Provide temporary fences, barricades or guards as required to protect trees and vegetation to be left standing.
  - 2. Provide protection for tree roots over 1-1/2 inches diameter that are cut during any construction operation. Coat the cut faces with emulsified asphalt, or other acceptable coating, especially formulated for horticultural use on cut or damaged plant tissues. Temporarily cover all exposed roots of trees with wet burlap to prevent roots from drying out; provide earth cover as soon as possible.
  - 3. Repair or replace unnecessarily damaged trees and vegetation, as determined by the Engineer/City Arborist and/or Planning Department, resulting from any construction operation, in a manner acceptable to the property owner and the Engineer. A qualified nurseryman shall perform tree damage repair. Replace unnecessarily damaged trees that cannot be repaired and restored to full-growth status, as determined by the tree surgeon. Replace felled trees in accordance with the approved plan.

**E. Protection of Adjacent Property:**

1. Protect improvements, trees and vegetation on adjoining property as well as those on property requiring route-clearing work.
2. Execute work so as not to create a nuisance to any person including persons utilizing adjacent property.
3. Use work methods and provide temporary facilities as necessary to prevent washing, erosion, siltation or dust damage, or hazard to persons and property, within and off the work area.

**PART 2 – PRODUCTS**

**2.01 EQUIPMENT**

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

**PART 3 – EXECUTION**

**3.01 CLEARING**

- A. Route clearing operations shall begin no more than seven days before beginning construction work for any area.
- B. Materials to be cleared, grubbed and removed from the project site include but are not limited to vegetation, trees, stumps, roots, lawns, shrubbery, gardens, paving, miscellaneous structures, debris, and abandoned utilities to the minimum practicable extent to complete the work. Limit clearing to a single lane work route without provision for construction vehicles to pass utility operation. Accurately determine limitations of construction easement or right-of-way, and keep construction activity within such limits.
- C. Grubbing shall consist of completely removing roots, stumps, trash and other debris from all graded areas so that topsoil is free of roots and debris. Topsoil is to be left sufficiently clean so that further picking and raking will not be required.
- D. All stumps, roots, foundations and planking embedded in the ground shall be removed and disposed of. Piling and butts of utility poles shall be removed to a minimum depth of two feet below the limits of excavation for



structures, trenches and roadways or two feet below finish grade, whichever is lower.

- E. Landscaping features shall include, but are not necessarily limited to: fences, cultivated trees, cultivated shrubbery, property corners, man-made improvements, subdivision and other signs shall be moved off the easement. The Contractor shall take extreme care in moving landscape features and shall re-establish these features as directed by the Engineer.
- F. Surface rocks and boulders shall be grubbed from the soil and removed from the site if not suitable as Rip Rap.
- G. Where tree limbs interfere with utility wires, or where the trees to be felled are in close proximity to utility wires, the tree shall be taken down in sections to eliminate the possibility of damage to the utility.
- H. Any work pertaining to utility poles shall comply with the requirements of the appropriate utility.
- I. All fences adjoining any excavation or embankment that, in the Contractor's opinion, may be damaged or buried, shall be carefully removed, stored and replaced. Any fencing that, in the Engineer's opinion, is significantly damaged shall be replaced with new fence material of equal or better quality and construction.
- J. Stumps and roots shall be grubbed and removed to a depth not less than two feet below grade. All holes or cavities which extend below the subgrade elevation of the proposed work shall be filled with crushed rock or other suitable material, compacted to the same density as the surrounding material.
- K. The Contractor shall exercise special precautions for the protection and preservation of trees, cultivated shrubs, sod, fences, etc. situated within the limits of any temporary easements, but not directly within the permanent easements. The Contractor shall be held liable for any damage the Contractor's operations have inflicted on such property.
- L. The Contractor shall be responsible for all damages to existing improvements outside the permanent easement resulting from Contractor's operations.
- M. Remove lawn sod by cutting into maximum size which can be handled without tearing, stripping sod and underlying topsoil, and stockpiling for use in restoring the surface area. Water sod and otherwise maintain sod in viable, growing condition. Alternative means of lawn sod replacement may be considered by the Engineer.
- N. Remove above-grade structures only where specifically authorized.

- O. Remove conflicting fences and provide effective, temporary measures to prevent domestic animals from wandering to other lands. Reconstruct fences promptly.
- P. Remove abandoned underground facilities such as utilities and structures, walls, footings, basements, wells, septic tanks, cisterns, underground pipe, and other items which conflict with construction.

### **3.02 HOLES AND DEPRESSIONS**

- A. Fill holes, depressions and voids created or exposed by clearing operations with non-organic soil material, unless further excavation or earthwork is indicated.
- B. Place fill material in horizontal layers not exceeding six inches loose-depth and thoroughly compact to a density at least equal to adjacent original ground.

### **3.03 DISPOSAL OF WASTE MATERIALS**

- A. Disposal General Requirements: Accomplish disposal of cleared matter daily so as to maintain site in a safe and neat condition throughout the contract period. Owners of the property may remove merchantable timber, buildings or other items of value from the work site before the Contractor begins operations, and no assurance exists that any such material will be on the work site when the Contractor begins work.
- B. On-Site Disposal:
  - 1. On undeveloped property, grind trees, limbs and brush into mulch and distribute within the work area from which cut, in such a way as not to be objectionable to the property owner. Properly dispose of all materials not utilized for mulch off-site. On developed property, remove all such clearing waste and properly dispose of it off-site.

### **3.04 DISPOSAL OF DEBRIS**

- A. The debris resulting from the clearing and grubbing operation shall be hauled to a disposal site secured by the Contractor and shall be disposed of in accordance with all requirements of federal, state, county and municipal regulations. Except that debris utilized as mulch, no debris of any kind shall be deposited in any stream or body of water, or in any street or alley. No debris shall be deposited upon any private property except with written consent of the property owner. In no case shall any material or debris of

any kind be left on the Project, shoved onto abutting private properties or buried on the Project.

### **3.05 CONSTRUCTION ACCESS ROUTE ON EASEMENT**

- A. When directed by the Engineer, a construction access route shall be built on the sewer easement for the purpose of accessing manholes and performing all other necessary work within the easement.
- B. Construction access route shall be cut (10) ten feet wide, minimum, and (6) six inches deep below existing grade. Filter fabric shall be placed at the bottom of the cut, and surge stone shall be placed on top of the fabric, filling the six inch depth along the roadway.
- C. The filter fabric for use under the stone shall be as specified in Section 02125.
- D. Surge stone shall be 4" to 6" size (4X6) rip rap type stone, or equivalent. Use sound, tough, durable stones resistant to the action of air and water. Slabby or shaley pieces will not be acceptable. Specific gravity shall be 2.0 or greater. Stones shall have less than 66 percent wear when tested in accordance with AASHTO T-96.

### **3.06 TREE REMOVAL ON EASEMENTS**

- A. The contractor shall conform to the requirements of the City of Atlanta's Tree Protection Ordinance before work commences
- B. The Engineers approval shall be obtained prior to the removal of any trees from the easement. Such concurrence shall be obtained in writing.
- C. The approval of the Engineer concerning the method and location of disposal of materials must be agreed with the owner and engineer before work commences.
- D. All trees that need further processing (wood chips) on-site or disposal off-site must be processed or disposed of in conformance with Federal, State, and local rules and regulations.
- E. Contractor shall ensure all utilities are located prior to the commencement of any clearing or construction work in the easement.
- F. Contractor must acquire any necessary permits prior to commencement of any type of work done in the easement especially for the removal of trees and crossing of waterways.

- G. Trees shall be felled into the cleared construction area or areas to be cleared and not onto vegetation to be preserved.
- H. Trees that have fallen into water bodies, or beyond the construction area, shall be removed immediately.

END OF SECTION

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**SECTION 02125****Erosion and Sedimentation Control****PART 1 – GENERAL****1.01 SCOPE**

- A. The work specified in this Section consists of providing, maintaining and/or removing temporary erosion and sedimentation controls and providing and installing permanent erosion control measures, all as shown on the Contract Drawings and specified herein
- B. Erosion and sediment controls include all appropriate techniques and materials as described in Chapter 6 of the “Manual for Erosion and Sediment Control in Georgia”, published by the Georgia Soil and Water Conservation Commission (4310 Lexington Road, Athens, GA 30603, also available for free download on line at [www.gaswcc.org](http://www.gaswcc.org)) and as modified or enhanced in the Contract Specifications and Drawings.
- C. All erosion and sediment control facilities shall be designed based on a 25-year, 24-hour rainfall event unless otherwise noted or directed by the Engineer.

**1.02 RELATED SECTIONS**

- A. This Section references the following related Specification Sections:
  - 02270 – Vegetative Erosion Control
  - 02271 – Gabions
  - 02273 – Riprap
  - 03300 - Cast-In-Place Concrete

**1.03 SUBMITTALS AND PERMITS**

- A. Furnish submittals in accordance with General Conditions Section GC-28, Working Drawings, Shop Drawings, Data on Material and Equipment, Samples and Licenses, and Manual for Erosion And Sediment Control in Georgia.
- B. Submittals and Permits:

Within 15 days after the date of the Notice to Proceed, the Contractor shall submit a written description, drawings and schedule for typical applications of proposed temporary erosion and sedimentation controls through City of Atlanta’s Bureau of Buildings to acquire a blanket Land Disturbance Permit (via the Site Development Department of the City of Atlanta’s Department of

## Section 02125 – Erosion and Sedimentation Control

Watershed Management), and shall submit the documents to the Engineer for review. The description, drawings and schedule shall meet the requirements of the Georgia Erosion and Sedimentation Act of 1975 (OCGA 12-7-1), as amended, (available from the Environmental Protection Division of the Georgia Department of Natural Resources at 4244 International Parkway, Suite 114, Atlanta, GA 30354, also available for free download on line at <http://www.gadnr.org/>), the Rules of Georgia Department of Natural Resources Environmental Protection Division, Chapter 391-3-7 "Erosion and Sedimentation Control" (available from the Environmental Protection Division of the Georgia Department of Natural Resources at 4244 International Parkway, Suite 114, Atlanta, GA 30354, also available for free download on line at <http://www.gadnr.org/>) and the City of Atlanta's Code of Ordinances, Part II, Chapter 74, Article II "Land Disturbing Activities" (available from the City of Atlanta at 55 Trinity Avenue, Suite 4100 Atlanta, Georgia 30303, also available for free download on line at [www.atlantaga.gov/](http://www.atlantaga.gov/)). The Contractor shall pay any required fees for the Land Disturbance Permit. Land disturbance activity shall not commence until the Land Disturbance Permit is issued. The Engineer will provide reproducible plan sheets to the Contractor for Contractor's use. The reproducible plan sheets will not bear the Engineer's seal or logo and is provided only for the Contractor's convenience in obtaining the land disturbance permit. The Contractor shall be responsible for submitting to the Bureau of Buildings necessary and sufficient documentation to enable issuance of a permit. All fines imposed for violating the terms of the permit shall be paid by the Contractor at no additional cost to the Owner.

- C. The written description, drawings and schedule shall indicate typical erosion and sediment controls for typical land disturbing activities that will ensure stormwater and site drainage from the temporarily disturbed areas shall be filtered or otherwise managed to minimize impacts on receiving waters and/or existing storm drain systems.
- D. The description, drawings and schedule shall include both temporary and permanent seedings. The submittal shall include selection of grass species (minimum of two cool season and two warm season for temporary and permanent stabilization), planting dates and rates of application for seed, agricultural lime, fertilizer and mulching.
- E. The contractor shall designate a Level 1-A certified worksite erosion control supervisor (WECS). The WECS shall be available on a 24-hour basis, 7-days per week and shall be available on site at all times during land disturbing activities, have the responsibility and authority to coordinate all equipment, personnel, and materials needed to maintain project site erosion control in accordance with the management practices and standards established in Chapter 6 of the "Manual for Erosion and Sediment Control for Georgia", relevant permits, and the Contract Specifications and Drawings. Within 15 days after the date of Notice to

Proceed, the Contractor shall submit the name and contact phone number(s) of its appointed WECS.

#### **1.04 IMPLEMENTATION**

- A. Erosion and sedimentation control measures shown on the Contract Drawings are minimum requirements. The Contractor's methods of operation may dictate additional erosion and sedimentation control measures above and beyond those which are shown on the Contract Drawings and it shall be the Contractor's responsibility to determine and install such measures. The Contractor's failure to stabilize disturbed areas immediately following intermediate or final grading may dictate additional erosion and sedimentation control measures not shown on the Drawings and it shall be the Contractor's responsibility to determine and install such measures.
- B. The Contractor shall notify the Engineer of any changes and/or additions to the erosion and sedimentation control plan necessary to accommodate the Contractor's methods of operation. No additional payment shall be made for erosion and sedimentation control measures made necessary by the Contractor's methods of operation.
- C. The Contractor shall be solely responsible for control of erosion and sediment production within the project area boundaries and prevention of sedimentation of any adjacent waterways.
- D. The Contractor shall install controls that will ensure that stormwater and drainage from the disturbed area of the Project site shall be filtered or otherwise managed to minimize impacts on receiving waters and/or existing storm drain systems. Discharged waters shall, upon visual inspection, be reasonably free of soil particles and shall meet all applicable permit turbidity requirements. The Contractor shall be responsible for all water quality testing mandated by applicable permits.
- E. The Contractor shall be responsible for keeping the project site sufficiently moist to control dust.

#### **1.05 QUALITY ASSURANCE**

- A. General: Perform all work under this Section in accordance with all pertinent rules and regulations including, but not necessarily limited to, those stated in the applicable permits and the Contract Specifications.
- B. Conflicts: Where provisions of pertinent rules and regulations conflict with each other or these Specifications, the more stringent provisions shall govern. PART 2 – PRODUCTS



## **2.01 GENERAL**

- A. All materials shall be as described in Chapter 6 of the “Manual for Erosion and Sediment Control in Georgia” (referenced above) and as modified herein.
- B. See Specification Section 02270 - Vegetative Erosion Control for additional vegetative materials and techniques used for erosion and sediment control. Materials and techniques covered by Section 02270 include mulching, seeding, sodding, and erosion control blankets and matting as well as other stabilization methods.
- C. Netting shall be 1/2-inch mesh, galvanized steel, chicken wire.
- D. Geotextile for use under gabions, riprap, or other stone structures not designed for vehicle traffic shall be Mirafi “Filterweave 403” or approved equal.
- E. Geotextile for use under construction exits or other stone structures designed for vehicle traffic shall be Mirafi “600X” or approved equal
- F. Plywood shall be 3/4-inch thick exterior type.
- G. Grout, where required, shall be composed of 1 part Portland Cement and 3 parts sand and mixed with water to a workable consistency.

## **2.02 SEDIMENT BARRIER**

- A. Types A, B, and C silt fences shall meet the corresponding requirements of Section 171 - Temporary Silt Fence of the Department of Transportation, State of Georgia, Standard Specification Construction of Roads and Bridges, latest edition, as referenced in the “Manual for Erosion and Sediment Control in Georgia” (Standard Specification Book available at: GDOT, 2 Capitol Square, Room 215 – Contracts Administration, Atlanta, GA, 30334, 404-656-5293)
- B. Silt fence fabric for Type A and B fences shall be Mirafi “FF 100” or approved equal. Silt fence fabric for Type C fences shall be Mirafi “Filterweave 402” or approved equal.
- C. Hay bales shall be clean, weed-free cereal hay 80 to 100 pounds or larger.

## **2.03 RIP RAP**

- A. See Specification Section 02273 - Riprap for riprap material requirements.
- B. Unless otherwise shown or noted riprap shall be Type 3, as defined in Section 02273.

## **2.04 GABIONS (Not Used)**

## **2.05 CONCRETE**

- A. See Specification Section 03300 – Cast-In-Place Concrete for concrete material requirements.

# **PART 3 – EXECUTION**

## **3.01 BASIC PRINCIPLES**

- A. Conduct the earthwork and excavation activities in such a manner to follow existing contours and consider soil type and condition.
- B. Minimize the disturbed area and the duration of exposure to erosion elements.
- C. Stabilize disturbed areas immediately with the most efficient and effective erosion control measures..
- D. Safely convey run-off from the site to an outlet such that erosion will not be increased off site.
- E. Retain sediment on site that was generated on site.
- F. Minimize encroachment upon watercourses.

## **3.02 GENERAL**

- A. Provide all materials and promptly take all actions necessary to achieve effective erosion and sedimentation control in accordance with the Georgia Erosion and Sedimentation Act of 1975, as amended, Rules of Georgia Department of Natural Resources Environmental Protection Division, Chapter 391-3-7 “Erosion and Sediment Control”, and the City of Atlanta’s Code of Ordinances, Part II, Chapter 74, Article II “Land Disturbing Activities”. The Contractor shall follow the Best Management Practices as described in Chapter 6 of the “Manual for Erosion and Sediment Control in Georgia” and as modified in these Specifications.

- B. Silt dams, silt fences, traps, barriers, check dams, appurtenances and other measures and devices shall be installed as indicated on the Contract Drawings and as required by applicable permits, shall be maintained until no longer needed, and shall then be removed. Deteriorated hay bales and dislodged filter stone shall be replaced with new materials. Detention ponds, if constructed, shall be maintained in a condition ensuring that unfiltered water will not leave the pond.
- C. Where the Contractor's erosion and sedimentation control practices are inadequate, the Engineer may direct the Contractor to provide temporary vegetative cover with fast growing seedings. Such temporary vegetative cover shall be provided by the Contractor in compliance with the Manual for Erosion and Sedimentation Control in Georgia, specifically in the selection of grass species, planting dates and application rates for seed, fertilizer, agricultural lime, and mulching, with the exception that kudzu shall not be permitted.
- D. All erosion and sedimentation control devices, including check dams, shall be inspected by the Contractor at least weekly and after each rainfall occurrence and cleaned out and repaired by the Contractor as necessary.
- E. Temporary erosion and sedimentation control devices shall be installed and maintained from the initial land disturbance activity until the satisfactory completion and establishment of permanent vegetation. At that time, temporary devices shall be removed. Removal of sediment and erosion control measures shall be approved by the Engineer and shall not disturb established vegetation.
- F. Permanent erosion control measures shall be implemented as soon as practical after the completion of pipe installation or land disturbance for each site. In no event shall implementation be postponed when no further construction activities will impact that portion or segment of the Project. Partial payment requests may be withheld for those portions of the Project not complying with this requirement.
- G. If a location is indicated or noted on the Contract Drawings, dispose of all excess sediment removed from temporary erosion and sediment control devices on site as indicated. Where no on-site disposal is indicated or suitable, the sediment shall be hauled off site to an appropriate disposal location arranged by the Contractor and at its sole expense.
- H. See Specification Section 02270 - Vegetative Erosion Control for vegetative erosion and sediment control methodology including mulching, seeding, sodding, and erosion control blankets and matting as well as other stabilization methods.

- I. All excess materials and removed materials shall be removed from the site immediately after they are no longer in use.

### **3.03 CHECK DAM**

- A. Install and maintain check dam as indicated in the Manual for Erosion and Sediment Control in Georgia, and as modified in these specifications and as shown on the Drawings.
- B. Check dams shall be constructed to be stable throughout their planned life. The dam shall be constructed well into the abutment so that water cannot run around the dam.
- C. Haybale check dams may be used as temporary check dams in concentrated flow areas while vegetation is becoming established. Haybale check dams shall not be used where the drainage area exceeds 1 acre. The haybales shall be embedded a minimum of 4 inches on its upslope side.
- D. Periodic inspection of check dams is necessary. Repair shall be made as soon as possible to minimize damage and expense of repair. Sediment shall be removed when it reaches a depth of one-half the original dam height.
- E. Whenever check dams are removed, care shall be taken to minimize disturbance to the remainder of the watercourse. The area where the check dam was removed shall be immediately shaped and smoothed to watercourse dimensions, seeded and mulched.

### **3.04 SILT FENCE**

- A. Install and maintain silt fence as indicated in the Manual for Erosion and Sediment Control in Georgia, and as modified in these specifications and as shown on the Drawings.
- B. The filter fabric shall have an approved color mark yarn woven into the fabric or the manufacturer label and fabric name printed on the fabric every 100 feet.
- C. Post installation shall start at the center of the low-point (if applicable) with the remaining posts spaced 6 feet apart for Type A and B silt fences and 4 feet apart for Type C silt fence. Wood and steel post may be used with Type A and Type B silt fences. Only steel post shall be used with Type C silt fence. For post size requirement see the latest edition of the Manual for Erosion and Sediment Control in Georgia.

## Section 02125 – Erosion and Sedimentation Control

- D. Securely fasten geotextile to each support post in a way that will not result in tearing of geotextile when fence is subjected to service loads. The filter fabric shall be securely fastened to the fencing with staples or nails or other fasteners made for this purpose. The bottom of the filter fabric shall be installed in a toe trench. The toe trench shall then be filled with the soil and compacted.
- E. Install geotextile fabric in one piece or continuously sewn to make one piece, for full length and height of fence, including portion of geotextile buried in toe trench.
- F. Along stream buffers and other sensitive areas, two rows of Type C silt fence or one row of Type C silt fence backed by haybales shall be used.
- G. Silt fences shall be inspected immediately after each rainfall and at least weekly during normal construction activities and daily during prolonged rainfall. Any needed repairs shall be made immediately. Promptly repair or replace silt fence that becomes damaged, unfastened or slumps.
- H. Sediment deposits shall be removed when the deposits reach one-half the original height of the silt fence. Any sediment deposits remaining after the sediment barrier is no longer required shall be smoothed to conform to the natural topography and the area restored.

### 3.05 HAY BALES

- A. Install and maintain hay bales as indicated in the Manual for Erosion and Sediment Control in Georgia, and as modified in these specifications and as shown on the Drawings.
- B. Bales shall be placed lengthwise on the contour in a single row and embedded in the soil a minimum depth of 4 inches. Bales shall be securely anchored in place by stakes, bars or other acceptable means. Stakes for hay bale barriers shall be nominal 2 inch by 2 inch wood. The wood shall be sound with a minimum length of 3 feet. The stakes shall be driven into the ground 18 to 24 inches. Equivalent metal rods or steel bars may be used.
- C. Hay bales shall be inspected immediately after each rainfall and at least weekly during normal construction activities and daily during prolonged rainfall. Any needed repairs shall be made immediately.
- D. Sediment deposits shall be removed when the deposits reach one-half the original height of the hay bales. Any sediment deposits remaining after the sediment barrier is no longer required shall be smoothed to conform to the natural topography and the area restored as specified in the Contract Documents.

### 3.06 INLET SEDIMENT TRAP

- A. Install and maintain inlet sediment traps as indicated in the Manual for Erosion and Sediment Control in Georgia, and as modified in these specifications and as shown on the Drawings.
- B. Sediment traps shall be constructed on natural ground surface, on an excavated surface, or on machine compacted fill provided they have a non-erodible outlet.
- C. Fabric Frame Inlet Sediment Traps: Filter fabric fitted around a supporting frame shall be used for inlet protection where the inlet drains a relatively flat area (slope no greater than 5 percent) and the inlets do not receive concentrated flows. The frame shall be constructed from Type C silt fence filter fabric supported by steel posts. Stakes shall be spaced evenly around the perimeter of the inlet a maximum of 3 feet apart and securely driven into the ground approximately 18 inches deep. The fabric shall be entrenched 12 inches and backfilled with crushed stone or compacted soil. Fabric shall be securely fastened to the posts, and fabric ends shall be overlapped a minimum of 18 inches or wrapped together around a post.
- D. Baffle Box: A baffle box inlet sediment trap shall be used for inlets receiving runoff with a higher volume or velocity. The baffle box shall be constructed of 2" x 4" boards spaced a maximum of 1 inch apart or of plywood with weep holes. The weep holes shall be 2 inches in diameter spaced approximately 6 inches on center vertically and horizontally. The entire box shall be wrapped in Type C silt fence filter fabric. The filter fabric shall be entrenched 12 inches and backfilled. Gravel shall be placed outside the box, all around the inlet, to a depth of 2 to 4 inches.
- E. Block and Gravel Drop Inlet Sediment Traps: Block and gravel drop inlets shall be used where heavy flows are expected and where an overflow capacity is necessary to prevent excessive ponding around the structure. On each side of the structure one block, in the bottom row, shall be placed on its side to allow the pool to drain. The foundation shall be excavated at least 2 inches below the crest of the storm drain. The bottom row of blocks shall be placed against the edge of the storm drain for lateral support and to avoid washouts when overflow occurs. When needed, lateral support shall be provided to subsequent rows by placing 2" x 4" wood studs through the block openings. To hold gravel in place, hardware cloth or comparable wire mesh with ½ inch openings shall be carefully fitted over all block openings. Clean gravel shall be placed to a height of 2 inches below the top of the block on a 2:1 slope or flatter and smoothed to an even grade. Georgia DOT #57 washed stone is recommended.

- F. Gravel Drop Inlet Sediment Traps: Gravel drop inlet protection shall be used where heavy concentrated flows are expected. The slope toward the inlet shall be no steeper than 3:1. To prevent gravel from entering the inlet, an area of level stone, that is a minimum of 1 foot wide, shall be placed between the structure and around the inlet. Stone that is 3 inches or larger in diameter shall be used on the slope toward the inlet. On the slope away from the inlet, #57 ( $\frac{1}{2}$ " to  $\frac{3}{4}$ " diameter) washed stone shall be placed in a layer at least one foot (1') thick.
- G. Sod Inlet Protection: Sod inlet protection shall be used at the time of permanent seeding to protect inlets from sediment and mulch material until the permanent vegetation becomes established. The sod shall be placed to form a turf mat covering the soil for a distance of 4 feet from each side of the inlet structure. Sod strips shall be staggered so that adjacent strip ends are not aligned.
- H. Sediment traps shall be inspected daily and after each rain. Repairs shall be made as needed. Sediment shall be removed when the sediment has accumulated to one-half the height of the trap. For excavated inlet sediment traps, sediment shall be removed when one-half the storage capacity has been lost due to sediment accumulation. Sediment that is removed from sediment traps shall be properly disposed of and stabilized so that it will not enter the inlet or any waters bodies. Sediment shall not be washed into the inlet. Sod inlet protection shall be maintained as specified in the latest edition of the Manual for Erosion and Sediment Control in Georgia.
- I. Sediment traps shall be removed when the contributing drainage area has been adequately stabilized. All materials and any unstable soil shall be salvaged or properly disposed of. The disturbed area shall be brought back to proper grade then smoothed and compacted. All bare areas around the inlet shall be permanently stabilized.

### **3.07 TEMPORARY STREAM CROSSING**

- A. Install and maintain temporary stream crossings as indicated in the Manual for Erosion and Sediment Control in Georgia, and as modified in these specifications and as shown on the Drawings.
- B. The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat. To facilitate cleanout, the pool area shall be cleared.
- C. Fill material for the embankment shall be free of roots or other woody vegetation, organic material, large stones, and other objectionable material. The embankment shall be compacted in 8-inch layers by

traversing with construction equipment.

- D. The earthen embankment shall be seeded with temporary or permanent vegetation within 7 days of construction.
- E. Construction operations shall be carried out in such a manner that erosion and water pollution are minimized.
- F. All cut and fill slopes shall be 2:1 or flatter.
- G. Temporary sediment traps shall be inspected after each period of significant rainfall. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. The sediment removed shall be placed in the designated disposal area. The contaminated part of the gravel facing shall be replaced.
- H. The structure shall be checked for damage from erosion or piping. The depth of the spillway shall be checked periodically to ensure it is a minimum of 1.0 ft below the low point of the embankment. Any observed settlement of the embankment shall be filled immediately to slightly above design grade. Any riprap displaced from the spillway shall be replaced immediately.
- I. After all sediment-producing areas have been permanently stabilized, the structure and all unstable sediment shall be removed. The area shall be smoothed to blend with the adjoining areas and restored as specified in the Contract Documents.

### **3.08 RIP RAP**

- A. Refer to Specification Section 02273 - Riprap for general riprap requirements.
- B. Install and maintain riprap for all erosion and sediment control methodologies as indicated in the Manual for Erosion and Sediment Control in Georgia and as specified or modified in the Contract Documents.

### **3.09 GABIONS**

- A. Refer to Specification Section 02271 - Gabions for general gabion requirements
- B. Install and maintain gabions for all erosion and sediment control methodologies as indicated in the Manual for Erosion and Sediment Control in Georgia and as specified or modified in the Contract Documents.



### **3.10 CONCRETE**

- A. Refer to Specification Section 03300 - Cast-In-Place Concrete for general concrete requirements.
- B. Install concrete for all erosion and sediment control methodologies as indicated in the Manual for Erosion and Sediment Control in Georgia and as specified or modified in the Contract Documents.

### **3.11 CONSTRUCTION EXIT**

- A. Construction exits will be constructed and maintained in accordance with the Manual for Erosion and Sediment Control in Georgia as a minimum and/or as specified or modified in the Contract Documents.

END OF SECTION

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## SECTION 02140

### Dewatering

#### PART 1 – GENERAL

##### 1.01 SCOPE

- A. The Contractor shall dewater trench and structure excavations, in accordance with the Contract Documents. The Contractor shall secure all necessary permits to complete the requirements of this Section of the Specifications.
- B. Design, construct and maintain all wells, pumps, vacuum systems, sumps, dikes, levees, cofferdams and diversion and drainage channels as necessary to maintain the areas free from water and to protect the areas to be occupied by permanent work from water damage. Remove temporary works after they have served their purpose.
- C. The Contractor shall be responsible for the stability of all-temporary and permanent slopes, grades, foundations, materials and structures during the course of the Contract. Repair and replace all slopes, grades, foundations, materials and structures damaged by water, both surface and subsurface, to the lines, grades, and conditions existing prior to the damage, at no additional cost to the City.

#### PART 2 – PRODUCTS (NOT USED)

#### PART 3 – EXECUTION

##### 3.01 CARE OF WATER

- A. Except where the excavated materials are designated as materials for permanent work, material from required excavation may be used for dikes, levees, cofferdams and other temporary backfill.
- B. Furnish, install, maintain, and operate necessary pumping and other equipment for dewatering the various parts of the work and for maintaining the foundation and other parts free from water as required for constructing each part of the work.
- C. Install all drainage ditches, sumps, and pumps to control excessive seepage on excavated slopes, to drain isolated zones with perched water tables and to drain impervious surfaces at final excavation elevation.

Section 02140 – Dewatering

- D. Dewater by means that will insure dry excavations, preserve final lines and grades, do not disturb, or displace adjacent soil.
- E. All pumping and drainage shall be done with no damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic or the work of other contractors, and in accordance with all pertinent laws, ordinances and regulations.
- F. All dewatering activities shall comply with Specification Section 02125 – Erosion and Sediment Control.
- G. Do not overload or obstruct existing drainage facilities.
- H. After they have served their purpose, Contractor shall remove all temporary protective work at a satisfactory time and in a satisfactory manner. All diversion channels and other temporary excavations in areas where the compacted fill or other structures will be constructed shall be cleaned out, backfilled and processed under the same Specifications as those governing the compacted fill. Fill or grout all temporary-dewatering wells unless otherwise directed by the Engineer.
- I. When the temporary works will not adversely affect any item of permanent work or the planned usage of the Project, the Contractor may be permitted to leave such temporary works in place. In such instances, breaching of dikes, levees, and cofferdams may be required.

### 3.02 DEWATERING

- A. By the use of well points, pumps, tile drains, or other approved methods, the Contractor shall prevent the accumulation of water in excavated areas. Should water accumulate, it shall be promptly removed.
- B. Excavations shall be continuously dewatered to maintain a ground water level no higher than three to four feet below the lowest point in the excavation. Dewatering systems shall be designed to allow for localized variations in the depth of excavations required to reach a suitable foundation. Dewatering shall be accomplished well enough in advance of excavation to ensure that groundwater is already lowered prior to completing the final excavation to finish subgrade.
- C. All destabilized subgrade conditions caused by inadequate or untimely dewatering operations shall be undercut and backfilled with suitable backfill material at no additional cost to the City.

- D. Piezometric observation wells are required to monitor the ground water level to insure proper dewatering prior to excavation below the static water table. The number of wells required will vary depending on the size and depth of structures.

END OF SECTION

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**SECTION 02200**

**Earthwork**

**PART 1 – GENERAL**

**1.01 REQUIREMENTS**

- A. This Section includes earthwork and related operations, including, but not limited to: excavating all classes of material encountered; trenching, handling, storage, transportation, and disposal of all excavated and unsuitable material; construction of fills and embankments; backfilling around structures and pipe; backfilling all trenches and pits; compacting; all sheeting, shoring, and bracing; preparation of subgrades; surfacing and grading; and any other similar, incidental, or appurtenant earthwork operation which may be necessary to properly complete the Work.
- B. The Contractor shall provide all services, labor, materials, and equipment required for all earthwork and related operations necessary or convenient to the Contractor for furnishing complete Work as shown on the Drawings or specified in the Contract Documents.

**1.02 RELATED SECTIONS**

- B. The Work of the following Sections specifically apply to the Work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of Work.
  - 1. Section 01410: Testing Laboratory Services
  - 2. Section 02125: Erosion and Sedimentation Control
  - 3. Section 02140: Dewatering

**1.03 GENERAL**

- A. Safety: Comply with local regulations and with the provisions of the “Manual of Accident Prevention in Construction” of the Associated General Contractors of America, Inc., Occupational Safety and Health Act (OSHA) and all other applicable safety regulations.
- B. Earthwork operations shall be performed in a safe and proper manner with appropriate precautions being taken against all hazards.

- C. All excavated and filled areas for structure, trenches, fills, topsoil areas, embankments and channels shall be maintained by the Contractor in good condition at all times until final acceptance by the City. All damage caused by erosion or other construction operations shall be repaired by the Contractor using material of the same type as the damaged material at no cost to the City.
- D. The Contractor shall control grading in a manner to prevent water running into excavations. Obstruction of surface drainage shall be avoided and means shall be provided whereby storm water can flow uninterrupted in existing open ditches or channels, other surface drains, or temporary drains.
- E. No classification of excavated materials will be made, except for rock excavation. Excavation work shall include the removal and subsequent handling of all materials excavated or otherwise removed in performance of the Work, regardless of the type, character, composition or condition thereof.
- F. All earthwork operations shall comply with the requirements of OSHA Construction Standards, Part 1926, Subpart P, Excavations, Trenching, and Shoring, and Subpart O, Motor Vehicles, Mechanized Equipment, and Marine Operations, and shall be conducted in a manner acceptable to the Engineer.

#### **1.04 CONTRACTOR SUBMITTALS**

- A. The Contractor shall submit samples of all materials proposed to be used in the work in accordance with the requirements in Section GC-28 – Working Drawings, Shop Drawings, Data on Material and Equipment, Samples and Licenses. Sample size shall be as determined by the testing laboratory.
- B. Submittals shall be made in accordance with the requirements of the General Conditions of the Contract Documents. In addition, the following specific information shall be provided:
  - 1. Copies of permits obtained by the Contractor for the work.
  - 2. Test results, certification of compliance, source, and sample for all imported materials.
  - 3. Samples of fill materials to be used: Samples shall be submitted in 2 weeks in advance of use and shall consist of 0.5 cubic feet of each type of material.

## 1.05 QUALITY ASSURANCE

- A. Reference Standard: Comply with all federal, state and local laws or ordinances, as well as all applicable codes, standards, regulations and/or regulatory agency requirements including the partial listing below:
1. ASTM C136-84a Standard Method for Sieve Analysis of Fine and Course Aggregates.
  2. ASTM D1556-82 Test Method for Density of Soils in Place by the Sand-Cone Method.
  3. ASTM D698-78 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb (250-kg) Rammer and 12-in. (305-mm Drop).
  4. ASTM D3017-88 Test Method for Moisture Content of Soil and Rock Aggregate in Place by Nuclear Methods (Shallow Depth).

## PART 2 – PRODUCTS

### 2.01 SUITABLE FILL AND BACKFILL MATERIAL REQUIREMENTS

- A. General: Fill, backfill, and embankment materials shall be suitable selected or processed clean, fine earth, rock, or sand, free from grass, roots, brush, or other vegetation.
- B. Fill and backfill materials to be placed within 6 inches of any structure or pipe shall be free of rocks or unbroken masses of earth materials having a maximum dimension larger than 3 inches.
- C. Suitable Materials: Materials not defined as unsuitable in Section 2.02 are defined as suitable materials and may be used in fills, backfilling, and embankment construction in **unpaved areas**. In addition, when acceptable to the Engineer, some of the material listed as unsuitable may be used when thoroughly mixed with suitable material to form a stable composite.
- D. Suitable materials may be obtained from on-site excavations, may be processed on-site materials, or may be imported. If imported materials are required by this Section, or to meet the quantity requirements of the project, the Contractor shall provide the imported materials at no additional expense to the City, unless a unit price item is included for imported materials in the bidding schedule.



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E. Earthwork Materials:

1. Controlled Fill Soils:

- a. Proposed fill soils shall be laboratory tested prior to construction use to determine their suitability. All material shall be subject to the approval of the Engineer. Testing shall be paid for separately by the City directly to the testing laboratory.
- b. Notification: For approval of imported fill material, notify the Engineering and Testing Laboratory at least three (3) weeks in advance of intention to import material, designate the proposed borrow area, and permit the Testing Laboratory to sample as necessary from the borrow area for the purpose of making acceptance tests to prove the quality of the material. Test results shall be submitted to the Engineer for approval.
- c. All fill material shall be soil exclusive of organic matter, frozen lumps, or other deleterious substances.
- d. It shall contain no rocks or lumps over 3-inches maximum in dimension.
- e. Fill material shall be low to moderate plasticity soil (PI less than 30).

2. Structural Fill and Structural Backfill:

- a. Select on site materials may be suitable. Testing and recommendation of suitability shall be made by the Testing Laboratory and submitted by the Contractor to the Engineer for approval. Testing shall be paid for separately by the City directly to the testing laboratory.
- b. Imported material shall be sand, uniformly graded crushed stone or other select material recommended by the Testing laboratory and submitted by the Contractor to the Engineer for approval. Graded aggregate base material as specified in Section 02575, Removing and replacing pavement, is acceptable.
- c. Crushed Stone: Crushed s used for pipe bedding and drain stone shall conform to the Georgia Department of Transportation Standard Specifications for Construction of Road and Bridges, 800.01 for No. 57 Stone. For concrete, cast iron, steel and galvanized iron pipe less than 12-inch,

use  $\frac{3}{4}$  inch gravel, crushed gravel or crushed stone. For plastic pipe use  $\frac{1}{4}$  -inch pea gravel.

3. Top Soil: Dark organic weed free loam free of muck.
4. Coarse Aggregate: Coarse aggregate shall conform to the Georgia Department of Transportation Standard Specifications for construction of Road and Bridges, 800.01 for No. 57 Stone, Group II, and shall have the following gradation:

Sieve Size	Percent Passing	
1-1/2 inch	100	-
1 inch	95	100
$\frac{3}{4}$ inch	-	-
$\frac{1}{2}$ inch	25	60
#4	0	10
#8	0	5

- F. Sheeting, Bracing, and Timbering: The Contractor shall furnish, place and maintain all sheeting, bracing and timbering required to properly support trenches and other excavations in open cut and to prevent all movements of the soil, pavement, structures, or utilities outside of the trench or pit.

1. General:
  - a. Sheeting, bracing and timbering shall be so placed as to allow the Work to be constructed to the lines and grades shown on the Drawings and as ordered by the Engineer.
  - b. If at any time the method being used by the Contractor for supporting any material or structure in or adjacent to any excavation is not reasonably safe in the opinion of the Engineer, the Engineer may require and the Contractor shall provide additional bracing and support necessary to furnish the added degree of safety required by the Engineer. The Contractor shall provide bracing and support by such methods accepted by the Engineer as Contractor may elect to use, but the taking of such added precautions shall in no way relieve the Contractor of sole and final responsibility for the safety of lives, work, and structures.
  - c. All sheeting in contact with the concrete or masonry shall be removed or cut off and left in place as instructed by the Engineer.

**2. Timber:**

- a. Timber may be substituted for steel sheet piling when approved by the Engineer. Timber for shoring, sheeting and bracing shall be sound and free of large or loose knots and in good condition. Size and spacing shall be in accordance with OSHA regulations.
- b. Remove bracing and sheeting in units when backfill reaches the point necessary to protect the work and adjacent property. Leave sheeting in place when, in the opinion of the Engineer, it cannot be safely removed. Cut off sheeting left in place below the finished ground surface as instructed by the Engineer.

**3. Steel Sheet Piling:**

- a. Steel sheet piling shall be the continuous interlock type. The weight, depth and section modulus of the sheet piling shall be sufficient to restrain the loads if earth pressure and surcharge from existing foundations. Procedure for installation and bracing shall be so scheduled and coordinated with the removal of the earth that the ground under existing structures shall be protected against lateral or vertical movements at all times. In addition to the drawings and computations, the Contractor shall provide closure and sealing details between sheet piling and existing facilities, as well as method of excavation within sheet piling to the Engineer for review before commencing construction operations. Contractor shall be responsible for all damage to existing utilities and structures resulting from installation of sheet piling. Damage to existing utilities and/or structures resulting from installation of sheet piling shall be repaired to the satisfaction of the Engineer at the Contractor's expense.

- G. Other Materials: All other materials, not specifically described but required for proper completion of the work of the Section, shall be as selected by the Contractor subject to prior approval of the Engineer.

**2.02 UNSUITABLE SOIL MATERIAL****A. Unsuitable materials include the materials listed below:**

1. Soils, which, when classified under ASTM D 2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil

Classification System), fall in the classifications of Pt, OH, CH, MH, or OL;

2. Soils that cannot be compacted sufficiently to achieve the density specified for the intended use;
3. Materials that contain hazardous or designated waste materials, including petroleum hydrocarbons, pesticides, heavy metals, and any material which may be classified as hazardous or toxic according to applicable regulations;
4. Soils that contain greater concentrations of chloride or sulfate ions, or have a soil resistivity or pH less than the existing on-site soils;
5. Topsoil except as allowed below.

### 2.03 MATERIALS TESTING

- A. All soils testing of samples will be done by a testing laboratory selected by the City in accordance with Section 01410. Testing shall be paid for by the City. At its discretion, the Engineer may request that the Contractor supply samples for testing of any material used in the Work.
- B. Particle size analysis of soils and aggregates will be performed using ASTM D 422 - Standard Test Method for Particle-Size Analysis of Soils.
- C. Determination of sand equivalent value will be performed using ASTM D 2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
- D. Unified Soil Classification System: References in this Section to soil classification types and standards shall have the meanings and definitions indicated in ASTM D 2487. The Contractor shall be bound by all applicable provisions of said ASTM D 2487 in the interpretation of soil classifications.
- E. The testing for chloride, sulfate, resistivity, and pH will be done in accordance with ANSI/AWWA C-105/A21.5 Standard.

### 2.04 ROCK EXCAVATION

- A. Mechanical rock excavation shall include removal and disposal of the following:
  1. All boulders measuring 1/3 of a cubic yard or more in volume;

2. All rock material in ledges, bedding deposits, and un-stratified masses which cannot be removed without systematic drilling and jack-hammering or blasting.
  3. Conglomerate deposits which are so firmly cemented that they possess the characteristics of solid rock and which cannot be removed without systematic drilling and jack-hammering or blasting.
- B. Blasting – See Specification Section 02405.

## **PART 3 – EXECUTION**

### **3.01 EXCAVATION - GENERAL**

- A. General: Except when specifically provided to the contrary, excavation shall include the removal of all materials of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the Work. The removal of said materials shall conform to the lines and grades indicated or ordered. Unless otherwise indicated, the entire construction site shall be stripped of all vegetation and debris, and such material shall be removed from the site prior to performing any excavation or placing any fill. The Contractor shall furnish, place, and maintain all supports and shoring that may be required for the sides of the excavations. Excavations shall be sloped or otherwise supported in a safe manner in accordance with applicable State safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926).
- B. Removal and Exclusion of Water: The Contractor shall remove and exclude water, including stormwater, groundwater, irrigation water, and wastewater, from all excavations. Dewatering wells, wellpoints, sump pumps, or other means shall be used to remove water and continuously maintain groundwater at a level at least two feet below the bottom of excavations before the excavation work begins at each location. Water shall be removed and excluded until backfilling is complete and all field soils testing have been completed.
- C. Topsoil:
1. Remove all topsoil to a depth at which subsoil is encountered, from all areas that are to be cut to lower grades or filled.
  2. Topsoil to be used for finish grading may be stored on the site. It shall be piled properly, sloped to drain, and covered.

3. Other topsoil may be used for fill in non-critical areas with prior approval of the Engineer

D. Bracing and Sheeting:

1. Furnish, install, and maintain all sheeting, bracing, and shoring as may be required to properly support the sides of all excavations and to prevent all movement of earth that could in any way injure the work, adjacent property, or workers.
2. Properly support all trenches for piping and duct bank installation so as to conform to all pertinent rules and regulations and these Specifications. All trenches deeper than 5 feet shall be shored unless cut to the angle of repose of the excavated soils.
3. Exercise care in the removal of sheeting, shoring, bracing and timbering to prevent collapse or caving of the excavation faces being supported and damage to the work and adjacent property.
4. Do not leave any sheeting or bracing in the trench or excavation after completion of the work, unless approved or instructed by the Engineer.
5. All sheeting in contact with concrete or masonry shall be removed or cut off and left in place as instructed by the Engineer.

E. Obstructions:

1. Remove and dispose of all trees, stumps, roots, boulders, pavement, pipes, and the like, as required for the performance of the work.
2. Exercise care in excavating around catch basins, inlets, manholes, piping, duct banks, underground vaults, etc.
3. Avoid removing or loosening castings or pushing dirt into structures.
4. Damaged or displaced casting shall be repaired and replaced, and dirt entering the structures during the performance of the work shall be removed at no additional cost to the City.

F. Utilities to be Abandoned:

1. When piped, conduits, sewers or other structures are removed from the trench leaving dead ends in the ground, such ends shall be fully plugged and sealed as indicated on the Drawings.

2. Abandoned structures such as manholes, catch basins, or chambers shall be entirely removed unless otherwise specified or indicated on the Drawings.

### 3.02 HEAVE MONITORING AND CONTINGENCY PLANNING

- A. Prior to excavation, pipe bursting or directional drilling, the Contractor shall identify any permanent structure, all buried utilities, all natural gas/petroleum pipelines, and any additional structures, which are within a horizontal distance 1.1 times the depth of any excavation deeper than the structure, utility, or natural gas pipeline. This Section does not limit the Contractor's choice of construction methods based on the site conditions.
- B. The Contractor shall perform, at a minimum, daily visual inspections of the perimeter of the pipe burst, drill path or excavation to identify any signs of excessive heave or movement. The results from visual inspections shall be recorded with the daily survey log. Any area, which appears to be excessively deformed or damaged, shall immediately be brought to the attention of the Engineer and be corrected.
- C. The Contractor shall prepare a contingency plan to mitigate the effects of excessive heave, settlement or movement of existing site features. The contingency plan is not to restrict the Contractor from using the best construction methods available to meet the conditions, but is required to demonstrate a reasonable preparedness to mitigate the effects of excessive heave movement or settlement. The following are minimum requirements for a contingency plan:
  1. The Contractor shall prepare a contingency plan, outlining steps to be taken to protect structures, utilities, or gas pipes and stop excessive heave movement or settlement identified by the heave/settlement monitoring program.
  2. The Contractor shall have all material, manpower, equipment, and other items identified in the contingency plan available at all times while excavations are ongoing or excavated areas are open.

### 3.03 STRUCTURE, ROADWAY, AND EMBANKMENT EXCAVATION

- A. Excavation Beneath Structures and Embankments: Except where otherwise indicated for a particular structure or ordered by the Engineer, excavation shall be carried to the grade of the bottom of the footing or slab. Where indicated or ordered, areas beneath structures or fills shall be over-excavated. The subgrade areas beneath embankments shall be excavated to remove not less than the top 6 inches of native material and where such subgrade is sloped, the native material shall be benched. When such over-excavation is indicated both over-excavation and subsequent backfill to the

required grade shall be performed by the Contractor. When such over-excavation is not indicated, but is ordered by the Engineer, such over-excavation and any resulting backfill will be paid for under a separate unit price bid item if such bid item has been established; otherwise, payment will be made in accordance with a negotiated price. After the required excavation or over-excavation has been completed, the exposed surface shall be scarified to a depth of 6 inches, brought to optimum moisture content, and rolled with heavy compaction equipment to obtain 98 percent of maximum density.

- B. Excavation Beneath Paved Areas: Excavation beneath paved areas shall be provided at minimum dimension shown on the drawings to minimize the disrupted area and volume of backfill required. All backfill material beneath paved areas shall be graded aggregate base material in accordance with Appendix F – Department of Public Works Public Right of Way Manual. The graded aggregate base surface elevation shall be depressed to receive the final pavement surface course as indicated on the Drawings. Controlled low strength flowable fill material may be provided in lieu of graded aggregate base if directed by the Engineer to provide backfill around sensitive or congested utilities or confined excavations where mechanical compaction is not practical.
- C. Notification of Engineer: The Contractor shall notify the Engineer at least 3 days in advance of completion of any structure excavation and shall allow the Engineer a review period of at least one day before the exposed foundation is scarified and compacted or is covered with backfill or with any construction materials.

### 3.04 PIPELINE AND UTILITY TRENCH EXCAVATION

- A. Exploratory Excavation:
  - 1. The Contractor shall excavate and expose buried points of connection to existing utilities as required by Engineer.
  - 2. Data, including dates, locations excavated, and sketches, shall be submitted to the Engineer within one week of excavation.
  - 3. Damage to utilities from excavation activities shall be repaired by the Contractor at no charge to the City.
- B. General: Unless otherwise indicated or ordered, excavation for pipelines and utilities shall be open-cut trenches with widths as indicated.
- C. Trench Bottom: Except when pipe bedding is required, the bottom of the trench shall be excavated uniformly to the grade of the bottom of the pipe bedding. Excavations for pipe bells and welding shall be made as required.



- D. Minimum Width of Trench: The minimum width of pipe trenches, measured at the crown of the pipe, shall not be less than 24-inches greater than the exterior diameter of the pipe, exclusive of bells. The minimum base width, measured at the invert of the piping, of such trench shall be not less than 24-inches greater than the exterior diameter of the pipe, exclusive of special structures or connections, and such minimum width shall be exclusive of all trench supports.
- E. Maximum Width of Trench: The maximum allowable width of trench for all pipelines measured at the top of the pipe shall be the outside diameter of the pipe (exclusive of bells or collars) plus 24-inches, and such maximum shall be inclusive of all timbers and/or trench boxes, shoring, etc. A trench wider than the outside diameter plus 24-inches may be used without special bedding if the Contractor, at his expense, will furnish pipe of the required strength to carry the additional trench load. Such modifications shall be submitted to the Engineer and approved in writing. Whenever such maximum allowable width of trench is exceeded for any reason, except as provided for on the Drawings or in the Specifications or by the written instruction of the Engineer, the Engineer shall, at his discretion, require that the Contractor, at its own expense for all labor and materials, cradle the pipe in Class "B" concrete, or other approved pipe bedding.
- F. Maximum length of Open Trench: Except by special permission by the Engineer, only that amount of pipe construction will be permitted, including excavation, construction of pipelines, and backfill in any one location, which can be completed in one day; however, maximum length of open trench shall never exceed 100 feet. This length includes open excavation, pipe laying and appurtenant construction and backfill that had not been temporarily resurfaced.
- G. Trench Side Slopes:
1. Temporary trench excavation shall at all times conform to the safety requirements of OSHA.
  2. Loose cobbles or boulders shall be removed from the sides of the trenches before allowing workers into the excavation, or the trench slopes must be protected with screening or other methods. Trench side slopes shall be kept moist during construction to prevent local sloughing and raveling. Surcharge loads due to construction equipment shall not be permitted within 5 feet of the top of any excavated slope.
  3. If the Contractor elects to shore or otherwise stabilize the trench sides, he shall file with the Engineer for review, copies of drawings for same prepared and signed by a Civil Engineer duly registered in the State Georgia before commencing excavation.

- H. Trench Over-Excavation: Where trenches are indicated to be over-excavated, excavation shall be to the depth indicated, and backfill shall be installed to the grade of the bottom of the pipe bedding.
- I. Over-Excavation: When ordered by the Engineer, whether indicated on the Drawings or not, trenches shall be over-excavated beyond the depth and/or width shown or specified. Such over-excavation shall be to the dimensions ordered. The trench shall then be backfilled to the grade of the bottom of the pipe bedding. Over-excavation less than the limits on the Drawings or less than specified shall be done at no increase in cost to the City. When the over-excavation ordered by the Engineer is greater than the limits shown, additional payment will be made to the Contractor. Said additional payment will be made under separate unit price bid items for over-excavation if such bid items have been established; otherwise, payment will be made in accordance with a negotiated price.
- J. Where pipelines are to be installed in embankments, fills, or structure backfills, the fill shall be constructed to a level at least one foot above the top of the pipe before the trench is excavated.
- K. If a moveable trench shield is used during excavation operations, the trench width shall be wider than the shield so that the shield is free to be lifted and then moved horizontally without binding against the trench sidewalls. If the trench walls cave in or slough, the trench shall be excavated as an open excavation with sloped sidewalls or with trench shoring, as indicated and as required by the pipe structural design.

### **3.05 OVER-EXCAVATION NOT ORDERED OR INDICATED**

- A. Any over-excavation beyond the limits shown on the drawings or specified which was not ordered by the City, shall be backfilled to the required grade with the specified material(s) at no additional cost to the City.

### **3.06 EXCAVATION IN LAWN AREAS**

- A. Where excavation occurs in lawn areas, the sod shall be carefully removed, dampened, and stockpiled to preserve it for replacement. Excavated material may be placed on the lawn, provided that a drop cloth or other suitable method is employed to protect the lawn from damage. The lawn shall not remain covered for more than 72 hours. Immediately after completion of backfilling and testing of the pipeline, the sod shall be replaced and lightly rolled in a manner so as to restore the lawn as near as possible to its original condition. Contractor shall provide new sod if stockpiled sod has not been replaced within 72 hours.

**3.07 EXCAVATION IN VICINITY OF TREES**

- A. Except where trees are indicated to be removed, trees shall be protected from injury during construction operations according to the Tree Protection Plan. No tree roots over 2 inches in diameter shall be cut without express permission of the Engineer. Trees shall be supported during excavation by any means previously reviewed by the Engineer.

**3.08 ROCK EXCAVATION**

- A. When rock is encountered in trenches, it shall be removed to a minimum depth of six inches (6") below the bell of the pipe.
- B. The rock shall be stripped and measured by the Engineer at five foot (5 ft.) intervals, and the quantity calculated as the actual length multiplied by the average depth multiplied by the average trench width. Trench width shall be a minimum of twenty-four inches (24"), and a minimum of three inches (3") wider on each side of the pipe bell.

**3.09 DISPOSAL OF EXCESS EXCAVATED MATERIAL**

- A. The Contractor shall remove and dispose of all excavated material in excess of that required to backfill the excavation and to create necessary fills. This shall be done immediately after the backfill is completed to the satisfaction of the Engineer. All materials removed shall become the property of the Contractor, and he shall make his own arrangements satisfactory to the Engineer for their disposition.
- B. All surplus material and such other materials as the Engineer may deem unfit for use as backfill, shall be disposed of by the Contractor so as to give a minimum of inconvenience to the public. In case of settlement after backfill, the Contractor shall supply sufficient material satisfactory to the Engineer to make up for the deficiency.
- C. When so ordered by the Engineer, the Contractor shall immediately remove all excavated materials from the site and dispose of the same.
- D. Any material, which may spill or drip from vehicles by hauling in the streets, shall be removed and the streets cleaned by the Contractor, to the satisfaction of the Engineer, or the proper officials of the municipality in which the hauling or work is being done.
- D. The surface of all graded and spoil areas shall be left in a smooth and level or evenly sloped condition, free from stones, rubbish, or other debris.

### **3.10 SOIL BACKFILL – GENERAL**

- A. Backfill shall not be dropped directly upon any structure or pipe. Backfill shall not be placed around nor upon any structure until the concrete has attained sufficient strength to withstand the loads imposed. Backfill around water retaining structures shall not be placed until the structures have been tested, and the structures shall be full of water while backfill is being placed.
- B. Except for drain rock materials being placed in over-excavated areas or trenches, backfill shall be placed after all water is removed from the excavation, and the trench sidewalls and bottom have been dried to moisture content suitable for compaction.
- C. If a moveable trench shield is used during excavation, pipe installation, and backfill operations, the shield shall be moved by lifting the shield free of the trench bottom or backfill and then moving the shield horizontally. The Contractor shall not drag trench shields along the trench causing damage or displacement to the trench sidewalls, the pipe, or the bedding and backfill.
- D. Immediately prior to placement of backfill materials, the bottoms and sidewalls of trenches and structure excavations shall have all loose sloughing, or caving soil and rock materials removed. Trench sidewalls shall consist of excavated surfaces that are in a relatively undisturbed condition before placement of backfill materials.

### **3.11 SOIL BACKFILL AND FILL PLACEMENT**

- A. Fill shall be placed in loose lifts not exceeding 8-inches in depth and shall be thoroughly compacted as herein specified.
- B. All fill placements may be subject to fill density and moisture tests, which shall be performed to verify that the specified degree of compaction is being achieved. Testing shall be paid for separately by the City directly to the testing laboratory.
- C. Prior to placement of any material in embankments, the area within embankment limits shall be stripped of topsoil and all unsuitable materials removed as described under Excavation. Area to receive fill shall then be scarified to a depth of at least 6-inches.
- D. Fill materials shall be placed in continuous approximately horizontal layers extending the full width of the embankment cross-section and the full dimension of the excavation where practicable.

- E. Fill materials shall be placed within 2 percent of the optimum moisture content. Optimum moisture shall be maintained by sprinkling the layers with water as placed or by allowing material to dry before placement.
- F. Compaction:
  1. Fill material shall be compacted to dry densities as determined by the Standard Proctor Compaction Test performed in accordance with ASTM D698. Testing shall be paid for separately by the City directly to the testing laboratory.
  2. Structural fill material supporting structures and pavement and other areas indicated on the Drawings shall be compacted to 95 percent of the maximum dry density. The upper 8" of fill shall be compacted to 95 percent of the maximum dry density.
  3. Controlled fill for general site grading shall be compared to 90 percent of the maximum dry density.
  4. Compaction of embankments shall be by sheepfoot rollers with staggered uniformly spaced knobs and suitable cleaning devices. The projected area of each knob and the number and spacing of the knobs shall be such that the total weight of the roller and ballast when distributed over the area of one (1) row of knobs shall be 250 psi. Placement and compaction of materials shall extend beyond the final contours sufficiently to insure compaction of the material at the resulting final surface. Final contours shall then be achieved by a tracked bulldozer or grader shaping the face of the embankment.
  5. Compaction of backfill around the structures shall be accomplished by power tamping equipment approved by the Engineer.
  6. If tests indicate that density of backfill is less than that specified, the area shall be re-compacted or undercut, filled, and compacted until specified density is achieved.
- G. Final Grading: Upon completion of construction operations, the area shall be graded to finish contour elevations and grades shown on the Drawings. Graded areas shall be made to blend with remaining ground surfaces. All surfaces shall be left smooth and free to drain.
- H. Moisture:
  1. All fill shall be compacted with the moisture content as established by the 95 percent intercept on the moisture density curves or the moisture content at the shrinkage limit, whichever is less.

2. If fill material is too wet, provide and operate approved means to assist the drying of the fill until suitable for compaction
3. If fill material is too dry, provide and operate approved means to add moisture to the fill layers.

I. Proofrolling:

1. All areas where pavement or structures are to be built on compacted fill and other areas where indicated on the Drawings, shall be proofrolled to detect soft spots prior to the placement of fill material or construction of foundations.
2. Proofrolling shall consist of the moving a 20-30 ton loaded dump truck or pneumatic tire roller over the subgrade after the subgrade is shaped. Proofrolling shall be witnessed by the Engineer.
3. Pneumatic-tired rollers shall have not fewer than four pneumatic tired wheels which shall be of such size and ply that tire pressure can be maintained between 80 and 100 pounds per square inch for 25,000 pound wheel load during rolling operations. Unless otherwise required, rolling shall be done with tires inflated to 90 psi. The roller wheels shall be located abreast in a rigid steel frame. Each wheel shall be loaded with an individual weight box so that each wheel will bear an equal load when traversing uneven ground. The weigh boxes shall be suitable for ballast loading such that the load per wheel shall be 25,000 pounds. The spacing of the wheels shall insure that the distance between the nearest edges of adjacent tires shall be not greater than one-half of the tire width of a single tire at the operating pressure for a 25,000 pound wheel load. The roller shall be operated not faster than 5 feet/second.
4. Subgrade shall be proofrolled with 6 passes of the roller. Depressions that develop during the proofrolling operations shall be filled with suitable material and those filled areas shall be proofrolled with 6 passes of the roller. If, after having been filled and proofrolled, the subgrade still contains depressions, the soil shall be undercut to the full depth of the soft material or 5 feet whichever is less, backfilled, and rolled to achieve a subgrade acceptable to the Engineer.
5. After the proofrolled subgrade has been accepted by the Engineer, the surface of the subgrade shall be finished with a smooth steel wheel roller weighing not less than 10 tons. Finished surface of the subgrade shall be within a tolerance of 0.04 feet at every point.
6. Conduits, pipes, culverts and underdrains shall be neither disturbed nor damaged by proofrolling operations. Rollers shall neither pass

over, nor approach closer than 5 feet of conduits, pipes, culverts and underdrains unless the tops of those facilities are deeper than 3 feet.

### 3.12 PIPE BEDDING

- A. The contractor shall excavate to a minimum of 8-inch below the bells or couplings for the full width of the trench and shall place a minimum of 8-inches of No. 57 crushed stone bedding upon which the pipe is to be laid. In cases as determined by the Engineer, where trench material is suitable for use as bedding, the trench may be excavated to a point above the invert grade, and the trench bottom handshaped so that the bottom segment of the pipe is firmly supported on undisturbed material.
- B. Gravity Sewers and Accessories: Lay all pipes with minimum Type 5 – Class B or C bedding unless shown or specified otherwise. Excavate the bottom of the trench flat at a minimum depth as shown on the Drawings, below the bottom of the pipe barrel. Place and compact bedding material to the proper grade before installing the pipe. After pipe has been brought to the proper grade, haunching material shall be carefully placed by hand and compacted to the top of the pipe.
- C. Manholes: Excavate to a minimum of 12-inch below the planned elevation of the base of the manhole. Place and compact crushed stone bedding material to the required grade before constructing the manhole.
- D. At pipe subgrade, if foundation soil in trench is soft, wet, spongy, and unstable or does not afford solid foundation for pipe, the Contractor shall excavate as instructed by Engineer and provide stable base for placement of pipe bedding. Quantities of in-place crushed rock bedding which are in excess to those required on Drawings will be paid on basis of Unit Prices listed in Bid Form.
- E. Where rock has been excavated in the trench, the Contractor shall construct a base by placing crushed rock upon which a subgrade can be prepared. Crushed rock bedding in excess to that shown on Drawings will be paid for on basis of Unit Prices listed in Bid Form.
- F. Before any pipe is lowered in place, the trench bottom or bedding shall be prepared so that each pipe will have a firm and uniform bearing over the entire length of the barrel and a width equal to one-half the outside diameter of the pipe. All adjustments in line and grade shall be made by scraping away or filling and tamping in under the barrel of the pipe. Wedging and/or blocking are not permitted.

### 3.13 PIPE AND UTILITY TRENCH BACKFILL

- A. Pipe Zone Backfill:

1. The pipe zone is defined as that portion of the vertical trench cross-section lying between a plane below the bottom surface of the pipe and a plane at a point above the top surface of the pipe. The bedding is defined as that portion of pipe zone, backfill material between the trench subgrade and the bottom of the pipe. The embedment is defined as that portion of the pipe zone backfill material between the bottom of the bedding and a level line of initial backfill (12" above the top of pipe).
2. After compacting the bedding, the Contractor shall perform a final trim using a stringline for establishing grade, such that each pipe section when first laid will be continually in contact with the bedding along the extreme bottom of the pipe. Excavation for pipe bells and welding shall be made as required.
3. The pipe zone shall be backfilled with the indicated backfill material. The Contractor shall exercise care to prevent damage to the pipeline coating, cathodic bonds, and the pipe itself during the installation and backfill operations.
4. If a moveable trench shield is used during backfill operations, the shield shall be lifted to a location above each layer of backfill material prior to compaction of the layer. The Contractor shall not displace the pipe or backfill while the shield is being moved.
5. Selected backfill material for the pipe zone shall consist of specified material herein or native or imported granular material as approved by Engineer in advance of placement. Place material in the trench simultaneously on each side of the pipe for the full width of the trench and the depth of the pipe zone in layers 6-inches in depth. Each layer shall be thoroughly compacted by mechanically tamping or vibrating. In all cases, backfilling of the pipe zone must be done by hand. Particular attention shall be given to underside of the pipe and fittings to provide a firm support along the full length of the pipe. The pipe zone shall be considered to extend 12-inches above the top of the pipe, and shall be compacted to a compaction of not less than 95 percent of maximum dry density at optimum moisture content as herein after specified. Care shall be taken not to damage pipe or special coatings on the pipe.

**B. Trench Zone Backfill:**

After the pipe zone backfills have been placed, backfilling of the trench zone may proceed. The trench zone is defined as that portion of the vertical trench cross-section lying as indicated between a plane above the top surface of the pipe and a plane at a point 18 inches below the finished surface grade, or if the trench is under pavement, 18 inches below the



roadway subgrade. If flooding, ponding, or jetting is used, the pipe shall be filled with water to prevent flotation.

- C. Backfilling Pipe Trench: After the pipe had been laid in the trench and has been inspected and approved, and backfilling in the pipe zone is complete and compacted, the remainder of the trench may be backfilled. The backfill material shall be suitable material as hereinbefore specified. Care shall be taken to insure that no voids remain under, around or near the pipes.
- D. Compaction: The maximum dry density and optimum moisture content of each soil type used in the controlled compacted fill shall be determined by ASTM D698 compaction method. Field density tests shall be determined in accordance with ASTM D1556. Testing shall be paid for separately by the City directly to the testing laboratory.
- E. Placement and Compaction of Trench Backfill: The placement and compaction of all trench backfill shall conform to one of the following methods, subject to the qualification specified therein:
  - 1. Mechanically Compacted Backfill (Unpaved Areas):. With approval of Engineer, backfill shall be mechanically compacted by means of tamping rollers, sheepsfoot rollers, pneumatic tire rollers, vibrating rollers, or other mechanical tampers to a minimum of 95 percent at optimum moisture. Trench backfill compaction above the pipe zone shall be to a minimum 95 percent in areas under buildings and pavements. Where the backfill soil has had a clay-like behavior and has a plasticity index of at least 12, only the upper 3-feet of material placed will require minimum compaction of 95 percent. All such equipment shall be of size and type approved by the Engineer. Impact-type pavement breakers (stompers) will not be permitted over any pipe. Permission to use specific compaction equipment shall not be construed as guaranteeing or implying that the use of such equipment will not result in damage to adjacent ground, existing improvements, or improvements installed under the Contract. The Contractor shall make its own determination in this regard. Mechanically compacted backfill shall be placed in horizontal layers not exceeding the maximum thickness of 8 inches. Each layer shall be evenly spread, the moisture content brought to near optimum condition and then tamped or rolled until the specified compaction and moisture content had been attained.
  - 2. Graded Aggregate Base (Paved Areas) – See Appendix F - Department of Public Works Public Right of Way Manual.
- F. Additional Material: Where final grades above the pre-construction grades are required to maintain minimum cover, additional fill material will be shown on the Drawings. Utilize excess material excavated from the trench, if the material is suitable. No additional payment will be made for additional

material when excavated materials are used. If excess excavated materials are not suitable, or if the quantity available is not sufficient, provide additional suitable fill material.

- G. Final Backfill: Final backfill is all backfill in the trench cross-sectional area within 18 inches of finished grade, or if the trench is under pavement, all backfill within 18 inches of the roadway subgrade.

### 3.14 BACKFILLING AROUND STRUCTURES

A. General:

1. Remove debris from excavations before backfilling.
2. Do not backfill against foundation walls until so instructed by the Engineer.
3. Wherever possible, backfilling shall be simultaneous on both sides of walls to equalize lateral pressures.
4. Do not backfill on only one (1) side of vertically spanning walls unless walls are adequately shored or permanent construction is in place to furnish lateral support on both top and bottom of wall.

### 3.15 FIELD TESTING

- A. General: All field soils testing will be done by a testing laboratory of the City's direction except as indicated below. Testing shall be paid for separately by the City.
- B. Where soil material is required to be compacted to a percentage of maximum density, the maximum density at optimum moisture content will be determined in accordance with Method C of ASTM D 698. Where cohesionless, free draining soil material is required to be compacted to a percentage of relative density, the calculation of relative density will be determined in accordance with ASTM D 4253 and D 4254. Field density in-place tests will be performed in accordance with ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method, ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth), or by such other means acceptable to the Engineer.
- C. In case the test of the fill or backfill show non-compliance with the required density, the Contractor shall accomplish such remedy as may be required to insure compliance. Subsequent testing to show compliance shall be by a testing laboratory selected by the City and paid by the Contractor.

- D. The Contractor shall provide test trenches and excavations including excavation, trench support, and groundwater removal for the City's field soils testing operations. The trenches and excavations shall be provided at the locations and to the depths required by the City.

### 3.16 GRADING

- A. General:
  - 1. Perform all rough and finish grading required to attain the elevations indicated on the Drawings.
  - 2. Perform rough grading to an accuracy of plus or minus 0.15 feet.
- B. Grading Around Buildings: Control the grading around buildings so the ground is pitched to prevent water from running into the excavated areas of a building or damaged other site features.
- C. Treatment After Completion of Grading:
  - 1. After grading is completed, permit no further excavation, filling or grading, except with the approval of the Engineer.
  - 2. Use all means necessary to prevent the erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

### 3.17 EXCESS WATER CONTROL

- A. Regulations and Permits: Obtain all necessary soil erosion control permits in accordance with the Georgia Soil Erosion and Sedimentation Control Act, and all pertinent rules, laws, and regulations.
- B. Unfavorable Weather:
  - 1. Do not place, spread, or roll any fill material during unfavorable weather conditions.
  - 2. Do not resume operations until moisture content and fill density are satisfactory to the Engineer.
  - 3. Any inundated area that freezes shall be removed and refilled at no additional cost to the City.
- C. Provide berms or channels to prevent flooding of subgrade. Promptly remove all water collected in depression.

**D. Pumping, Drainage and Dewatering:**

1. Provide, maintain and use at all times during construction adequate means and devices to promptly remove and dispose of all water from every source entering the excavations or other parts of the Work
2. Dewater by means that will insure dry excavations, preserve final lines and grades, and do not disturb or displace adjacent soil.
3. All pumping and drainage shall be done with no damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic or the work of other contractors, and in accordance with all pertinent laws, ordinances, and regulations.
4. Do not overload or obstruct existing drainage facilities.

**3.18 SETTLEMENT**

- A. The Contractor shall be responsible for all settlement of backfill, fills, and embankments, which may occur within one (1) year after final acceptance of the Work by the City.
- B. The Contractor shall make, or cause to be made, all repairs, or replacements made necessary by settlement within thirty (30) days after receipt of written notice from the Engineer.

**3.19 CLEANING**

- A. Upon completion of the Work of this Section, remove all rubbish, trash, and debris resulting from construction operations. Remove surplus equipment and tools. Leave the site in a neat and orderly condition acceptable to the engineer, and in conformance with the General Conditions of the Contract Documents.

END OF SECTION

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**SECTION 02224**

**JACK AND BORE OR TUNNEL INSTALLATION**

**PART 1 GENERAL**

**1.01 SCOPE**

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

**1.02 QUALITY ASSURANCE**

- A. Reference Standards: The Contractor shall comply with the applicable provisions and recommendations of the latest editions of the following standards, except as otherwise shown on the Drawings or specified herein.
  - 1. AASHTO M190 – Standard Specification for Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches
  - 2. ASTM A36 – Standard Specification for Carbon Structural Steel
  - 3. ASTM A123 – Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
  - 4. ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
  - 5. ASTM A307 – Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength

6. ASTM A1011 – Standard Specification for Steel, Sheet and Strip, Hot-Rolled Carbon, Structural, High-Strength, Low-Alloy, High-Strength Low-Alloy with Improved Formability and Ultra-High Strength.

### **1.03 SUBMITTALS**

- A. Submittals shall be made in accordance with the requirements of the General Conditions of the Contract Documents. In addition, the following specific information shall be provided:
- B. Method Submittals: The Contractor shall provide for the Engineer's approval, detailed plans for the methods proposed for the installation of the casing or construction of the tunnel. These plans shall address the following:
  1. Groundwater Control: The Contractor shall control groundwater throughout the installation of the casing or construction of the tunnel. The groundwater shall be controlled by dewatering (well points, sumps, or deep wells), grouting, freezing or other methods approved by the Engineer. The Contractor shall prepare a written, detailed plan for controlling the groundwater, citing similar installation conditions and results. This plan shall be submitted to the Engineer prior to any construction for the casing or tunnel.
  2. Face Protection: The face of the excavation shall be protected from the collapse of the soil into the casing or tunnel.
  3. Pit Design: The design of the jacking and receiving pits and required bearing to resist the jacking force is the responsibility of the Contractor. The Contractor shall engage the services of a professional engineer with current registration in the State of Georgia to design all cofferdam and sheeting and bracing systems for the jacking and receiving pits. The Contractor's Engineer shall submit to the Engineer a signed statement that he has been employed by the Contractor to design the cofferdam and sheeting and bracing systems.
  4. Submit additional working drawings, written procedures and calculations describing in detail the proposed jack and bore or tunneling method and the entire operation. Additional submittals shall include, but not be limited to, ground stabilization if proposed, excavation procedures, control of casing alignment and grade, support of face, detection of surface movement, procedure for installing pipes and anchors and placement of grout between the pipe and the casing and in the annular space around the tunnel. If, in opinion of the Contractor, modifications to the methods are required during construction, working drawings shall be submitted delineating such modifications, including reasons for the modifications.

- C. **Material Submittals:** The Contractor shall provide for the Engineer's approval, shop drawings, proposed construction drawings and other pertinent specifications and product data as follows:
  - 1. Shop drawings for casing pipe and tunnel liner plate showing sizes and connection details.
  - 2. Design mixes for concrete and grout.
  - 3. Casing Spacers.
- D. **Experience Submittals:** Jacking and boring casings and tunnel construction are deemed to be specialty contractor work. If the Contractor elects to perform the work, the Contractor shall provide evidence of experience as required by the General Conditions. A minimum of five continuous years of experience in installation of steel casings and tunnel construction is required of the Contractor proposed to do the work. Evidence of this experience shall be provided with the shop drawings for review by the Engineer.

#### **1.04 STORAGE AND PROTECTION**

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

#### **1.05 PROJECT PERMITS**

- A. The City has obtained permits as specified in Section 01060 of these specifications. The Contractor's attention is directed to the requirements and conditions contained in the permits. All costs imposed by the Georgia Department of Transportation or the railroad or other agencies as a requirement for the Contractor to complete the required scope of work will be paid for by the Contractor.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS AND CONSTRUCTION**

- A. **Casing**
  - 1. The casing shall be new pipe made from steel plate having minimum yield strength of 35,000 psi. The steel plate shall also meet the chemical requirements of ASTM A36.
  - 2. The outside of the casing pipe shall be coated with coal tar epoxy having a minimum dry film thickness of 16 mils. Surface preparation shall be SSPC-SP-10. Epoxy shall have a minimum solids content of 65 percent by volume and shall be air or airless spray applied. The minimum drying



time for the epoxy shall be seven days. Brushing shall be permitted in small areas only. All coating and recoating shall be done in strict accordance with the manufacturer's recommendations. Epoxy shall be Tnemec, Kop-Coat or Valspar.

3. The thicknesses of casings shown in the following table are minimum thicknesses. The actual thicknesses shall be determined by the casing installer, based on an evaluation of the required forces to be exerted on the casing when jacking. Any buckling of the casing due to jacking forces shall be repaired at no additional cost to the City.
4. The diameters of the casings shown in the following table and shown on the Drawings are minimum diameters. Larger casings, with the Engineer's approval, may be provided at no additional cost to the City, for whatever reasons the Contractor may decide, whether due to casing size availability, line and grade tolerances, soil conditions, etc.

B. Casing Sizes

1. Under Railroads:

Pipe Diameter, Inches	Casing Diameter, Inches	Wall Thickness, Inches (Uncoated)
6	14	0.282
8	18	0.313
10	20	0.344
12	22	0.375
14	24	0.407
16	30	0.469
18	30	0.469
20	32	0.501
24	36	0.532
30	42	0.563
36	48	0.688

42	54	0.813
48	60	0.876
54	66	1.000
60	72	1.125
64	76	1.125

2. Under Highways:

Pipe Diameter, Inches	Casing Diameter, Inches	Wall Thickness, Inches
6	12	0.250
8	16	0.250
10	16	0.250
12	18	0.250
14	22	0.250
16	24	0.250
18	30	0.312
20	30	0.312
24	36	0.375
30	42	0.375
36	48	0.500
42	56	0.500
48	60	0.500
54	66	0.750

60	72	0.750
64	78	1.000

C. Tunnel Liner

1. Tunnel liner plate shall consist of structural steel liner plates. Each section shall be composed of the number of plates required to produce a clearance around the pipe sufficient to install and properly joint the pipe. The liner plates shall be either 4-flange type or 2-flange lap-joint type.
2. Liner plates shall be fabricated from structural quality, hot-rolled carbon steel sheets or plates conforming to ASTM A1011.
3. Liner plates shall be galvanized in accordance with ASTM A123. All other hardware shall be hot dip galvanized in accordance with ASTM A153. Liner plates shall be bituminous coated in accordance with the requirements of AASHTO M190.
4. All liner plates shall be punched for bolting on both longitudinal and circumferential seams or joints and shall be so fabricated as to permit complete erection from inside the tunnel. All plates shall be of uniform fabrication and those intended for one size tunnel shall be interchangeable.
5. The plates shall be furnished with 2-inch diameter grout holes to facilitate grouting the annular space above and around the tunnel liner. All grout holes shall be equipped with screw type galvanized plugs for final watertight closure of the grout holes. Grout holes shall be spaced as shown on the Drawings.
6. Bolts and Nuts:
  - a. Bolt spacing shall be as specified by the plate manufacturer and shall be sufficient to develop the full strength of the plates.
  - b. Bolts and nuts used with the 2-flange plates shall be a minimum of 5/8-inch in diameter and shall conform to ASTM A307
  - c. Bolts and nuts used with 4-flange plates shall be not less than ½-inch in diameter for plate thicknesses up to and including 0.179-inches (7 gage) and not less than 5/8-inch in diameter for plates of greater thickness. The bolts and nuts shall be quick acting coarse thread and shall conform to ASTM A307.
  - d. Where required, bolts and nuts shall be hot dipped galvanized in accordance with ASTM A153.

D. Casing Spacers

1. Casing spacers shall meet one of the following requirements:
    - a. Casing spacers shall be flanged, bolt-on style with a two-section stainless steel shell lined with a PVC liner, minimum 0.09-inch thick also having a hardness of 85-90 durometer. Runners shall be attached to stainless steel risers which shall be properly welded to the shell. The height of the runners and risers shall be manufactured such that the pipe does not float within the casing. Casing spacers shall be manufactured by Cascade Waterworks Manufacturing Company, Advanced Products & Systems, Inc., or approved equal.
    - b. Casing spacers shall be a two-section, flanged, bolt on style constructed of heat fused PVC coated steel, minimum 14 gauge band and 10 gauge risers, with 2-inch wide fiberglass reinforced polyester insular duty PVC inner liner, minimum 0.09-inch thick, having a hardness of 85-90 durometer, and all stainless steel hardware. Casing spacer shall be manufactured by Pipeline Seal and Insulator, Ltd., or approved equal.
  2. Casing spacers shall be designed for the general configuration shown on the Drawings, including provisions for other conduits to be installed within the casing in addition to the carrier pipe.
- E. Grout: Grout shall be used for filling the void between the casing and the carrier pipe. Cement shall conform to ASTM C150, Type I or II. Grout shall have a minimum compressive strength of 100 psi attained within 24 hours.
- F. Carrier Pipe: Carrier pipes shall be as specified in Section 02665, Water Mains and Accessories; Section 02667, Large Water Transmission Mains and Section 02537, Ductile Iron Sanitary Sewer Pipe and Fittings. All joints of pipe in the casing shall be restrained.
- G. Surface Settlement Markers: Surface settlement markers within pavement areas shall be P.K. nails. Surface settlement markers within non-paved areas shall be wooden hubs.

## **2.02 EQUIPMENT**

- A. Casings
1. A cutting head shall be attached to a continuous auger mounted inside the casing pipe.
  2. On casing pipe for water lines over 60 feet in length, the installation equipment shall include a steering head and a grade indicator.
  3. The steering head shall be controlled manually from the bore pit. The grade indicator shall consist of a water level attached to the casing which

will indicate the elevation of the front end of the casing or some other means for grade indication approved by the Engineer.

4. The steering head and grade indicator shall utilize a laser guidance system.

## B. Tunnels

### 1. Tunnel Boring Machine (TBM)

- a. The TBM shall be equipped with disc cutters of diameter 19 inches or greater designed for operation at thrusts of up to 70 kips per cutter.
- b. The TBM shall afford adequate protection against loss of ground and permit ground support adjacent to the tunnel face, as required by ground conditions.
- c. The TBM shall be equipped with a dust control system which includes a water spray system, dust shield and dust scrubber system.
- d. The method used to advance the TBM shall ensure its correct alignment at all times, without binding or imposing excessive loads on the primary tunnel supports or upon the surrounding ground.
- e. The TBM shall be equipped with a roll indicator and laser target system, which allows the operator to observe the machine's alignment and orientation (predictor system) from the control station.
- f. The TBM shall be grounded in accordance with the latest requirements of the National Electrical Code and equipped with ground fault protection.

### 2. Other Tunneling Equipment

- a. Power machinery and tools within the tunnel shall be operated by either electricity, compressed air, diesel with approved scrubber or other approved power. Electrical tools and equipment shall be grounded in accordance with the latest requirements of the National Electrical Code.
- b. All electrical equipment and power receptacles shall have appropriate ground fault protection.
- c. Provide temporary electrical lights to properly and safely illuminate all parts of the shafts and tunnel including special illumination at the working face. Lighting circuits shall be thoroughly insulated and separated from power circuits, and lights shall be enclosed in wire cages. Secure electrical permits required for completion of this work.

## PART 3 EXECUTION

### 3.01 GENERAL

- A. Interpretation of soil investigation reports and data, investigating the site and determination of the site soil conditions prior to bidding is the sole responsibility of the Contractor. Rock and/or water, if encountered, shall not entitle the Contractor to additional compensation.
- B. Boring and jacking casing and tunnel construction shall be performed so as not to interfere with, interrupt or endanger roadway surface and activity thereon, and minimize subsidence of the surface, structures and utilities above and in the vicinity of the work. Support the ground continuously in a manner that will prevent loss of ground and keep the perimeters and face of the casing, passages and shafts stable. The Contractor shall be responsible for all settlement resulting from operations and shall repair and restore damaged property to its original or better condition at no cost to the City.

### **3.02 GROUNDWATER CONTROL**

- A. The Contractor shall control the groundwater throughout the installation of the casing or construction of the tunnel.
- B. When water is encountered, provide and maintain a dewatering system of sufficient capacity to remove water on a 24-hour basis keeping excavations free of water until the backfill operation is in progress. Dewatering shall be performed in such a manner that removal of soil particles is held to a minimum. Dewater into a sediment trap and comply with requirements specified in Section 02125, Temporary and Permanent Erosion and Sedimentation Control.
- C. Methods of dewatering shall be at the option and responsibility of the Contractor. Maintain close observation to detect settlement or displacement of surface facilities due to dewatering. Should settlement or displacement be detected, notify the Engineer immediately and take such action as necessary to maintain safe conditions and prevent damage.

### **3.03 SAFETY**

- A. Provide all necessary bulkheads and shields to ensure complete safety to all traffic, persons and property at all times during the work. Perform the work in such a manner as to not permanently damage the roadbed or interfere with normal traffic over it in those areas immediately adjacent and outside the active project work area.
- B. Observe and comply with all applicable requirements of GDOT. Conduct the operations in such a manner that all work will be performed below the level of the roadbed.
- C. Perform all activities in accordance with the Occupational Safety and Health Act of 1970 PL-596), as amended, applicable regulations of the Federal

Government, OSHA 29CFR 1926 and applicable criteria of ANSI A10.16-81, "Safety Requirements for Construction of Tunnel Shafts and Caissons".

### **3.04 HIGHWAY CROSSINGS**

- A. The Contractor shall be held responsible and accountable for the coordination and scheduling of all construction work within the highway right-of-way and the posting of all appropriate permits.
- B. Work along or across the highway right-of-way shall be subject to inspection by the highway department.
- C. All installations shall be performed to leave free flows in drainage ditches, pipes, culverts or other surface drainage facilities of the highway, street or its connections.
- D. No excavated material or equipment shall be placed on the pavement or shoulders of the roadway without the express approval of the highway department
- E. The Contractor will not be permitted to leave equipment (trucks, backhoes etc.) on the pavement or shoulder overnight. Construction materials to be installed, which are placed on the right-of-way in advance of construction, shall be placed in such a manner as not to interfere with the safe operation of the roadway.

### **3.05 RAILROAD CROSSINGS**

- A. The Contractor shall secure permission from the railroad to schedule work so as to not interfere with the operation of the railroad.
- B. Additional insurance is required for each railroad crossing. The Contractor shall furnish the railroad with such additional insurance as may be needed. The cost of such additional insurance shall be borne by the Contractor.
- C. All work on the railroad right-of-way, including necessary support of tracks, safety of operations and other standard and incidental operation procedures may be under the supervision of an authorized representative of the railroad and any decisions of this representative pertaining to construction and/or operations shall be final and construction must be governed by such decisions.
- D. If, in the opinion of the railroad, it becomes necessary to provide flagging protection or watchmen for the performance of any other work in order to keep the tracks safe for traffic, the Contractor shall coordinate such work and shall reimburse the railroad for such services, in accordance with procedures agreed upon by the Contractor and the railroad before construction is started.

- E. No blasting shall be permitted within the railroad right-of-way.

### **3.06 SURFACE SETTLEMENT MONITORING**

- A. Provide surface settlement markers, placed as specified and as directed by the Engineer. The Contractor shall place settlement markers outside of pavement area, along the centerline of the casing or tunnel at 20 foot intervals. Markers shall also be placed at each shoulder of the roadway, at each edge of pavement, at the centerline of the pavement and at 10 and 25 feet offset in each direction from the centerline of the casing. Tie settlement markers to bench marks and indices sufficiently removed as not to be affected by the Contractor's operations.
- B. Make observations of surface settlement markers, placed as required herein, at intervals acceptable to the Engineer. In the event settlement or heave on any marker exceeds 1-inch, the Contractor shall immediately cease work and using a method approved by the Engineer, take immediate action to restore surface elevations to those existing prior to start of Contractor's operations.
- C. Take readings and permanently record surface elevations prior to start of dewatering operations and/or shaft excavation. The following schedule shall be used for obtaining and recording elevation readings: all settlement markers, once a week; all settlement markers within 50 feet of the casing or tunnel heading, at the beginning of each day; more frequently at the Engineer's direction if settlement is identified. Make all elevation measurements to the nearest 0.01 foot.
- D. The Contractor shall cooperate fully with jurisdictional personnel. Any settlement shall be corrected by, and at the expense of, the Contractor.
- E. Promptly report any settlement and horizontal movement immediately to the Engineer and take immediate remedial action, at no cost to the City.

### **3.07 JACKING AND BORING**

- A. Pit
  - 1. Conduct jacking and boring operations from a pit excavated at one end of the section to be bored. Where conditions and accessibility are suitable, place the jacking pit on the downstream end of the bore.
  - 2. The pit shall be rectangular and excavated to a width and length required for ample working space. If necessary, sheet and shore the pit properly on all sides. Pit sheeting shall be timber or steel piling of ample strength to safely withstand all structural loadings of whatever nature due to site and soil conditions. Keep pit dry during all operations. Perform pit dewatering operations as necessary.



3. The bottom of the pit shall be firm and unyielding to form an adequate foundation upon which to work. In the event the pit bottom is not stable, excavate to such additional depth as required and place a gravel sub-base or a concrete sub-base if directed by the Engineer due to soil conditions.

B. Jacking Rails and Frame

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

- C. Jacking and boring of casing pipes shall be accomplished by the dry auger boring method without jetting, sluicing or wet boring.

- D. Auger the hole and jack the casing through the soil simultaneously.

- E. Bored installations shall have a bored-hole diameter essentially the same as the outside diameter of the casing pipe to be installed.

- F. Execute boring ahead of the casing pipe with care, commensurate with the rate of casing pipe penetration. Boring may proceed slightly in advance of the penetrating pipe and shall be made in such a manner to prevent any voids in the earth around the outside perimeter of the pipe. Make all investigations and determine if the soil conditions are such as to require the use of a shield.

- G. As the casing is installed, check the horizontal and vertical alignment frequently. Make corrections prior to continuing operation.

- H. Any casing pipe damaged in jacking operations shall be repaired, if approved by the Engineer, or removed and replaced at Contractor's own expense.

- I. Lengths of casing pipe, as long as practical, shall be used except as restricted otherwise. Joints between sections shall be completely welded in accordance with AWS recommended procedures. Prior to welding the joints, the Contractor shall ensure that both ends of the casing sections being welded are square.

- J. The Contractor shall prepare a contingency plan which will allow the use of a casing lubricant, such as bentonite, in the event excessive frictional forces jeopardize the successful completion of the casing installation.
- K. Once the jacking procedure has begun, it should be continued without stopping until completed, subject to weather and conditions beyond the control of the Contractor.
- L. Care shall be taken to ensure that casing pipe installed by boring and jacking method will be at the proper alignment and grade.
- M. The Contractor shall maintain and operate pumps and other necessary drainage system equipment to keep work dewatered at all times.
- N. The carrier pipe shall be installed to the line and grade required within the casing and after placed and approved by the Engineer, the space between the outside of the carrier pipe and the casing shall be completely filled with grout pumped in a continuous operation in a manner to prevent the occurrence of any voids between the carrier pipe and the casing.
- O. Adequate sheeting, shoring and bracing for embankments, operating pits and other appurtenances shall be placed and maintained to ensure that work proceeds safely and expeditiously. Upon completion of the required work, sheeting, shoring and bracing shall be left in place, cut off or removed, as directed by the Engineer.
- P. Refer to Section 02225, Trench Excavation and Backfill for additional information related to trench excavation, all classes and types of excavation, the removal of rock, muck and debris, and the excavation of all working pits and backfill.
- Q. All surplus material shall be removed from the right-of-way and the excavation backfilled and compacted flush with the surrounding ground.
- R. Grout backfill shall be used for unused holes or abandoned pipes.
- S. Any replacement of carrier pipe in an existing casing shall be considered a new installation, subject to the applicable requirements of these specifications

### **3.08 FREE BORE**

- A. Where the Drawings indicate a pipeline is to be installed by boring without a casing, the Contractor shall construct the crossing by the free bore method. The free bore method shall be accomplished by the dry auger method. The free bore method shall be accomplished by the dry auger boring method without jetting, sluicing or wet boring.

- B. The diameter of the free bore shall not exceed the pipe bell outside diameter or the pipe barrel outside diameter plus 1-inch, whichever is greater.
- C. Free boring, where indicated on the Drawings, shall be performed at the Contractor's option. The Contractor may choose to construct the crossing by the conventional jack and bore casing method. If the Contractor chooses this method, it will be at no additional cost to the City.
- D. The Contractor will be responsible for any settlement of the roadway caused by the free bore construction activities.

### **3.09 TUNNELS**

#### **A. Shaft Excavation**

- 1. Excavate in such a manner that over break is held to a minimum. In soil and mixed face conditions, install primary support in continuous and close contact with the excavated surface to control water inflow and prevent ground loss, so that adjacent structures are not affected by ground movements. Excavation in soil shall not be advanced ahead of the previously installed primary support any more than is necessary for the installation of the succeeding section of primary support.
- 2. Whenever shaft sinking is suspended, complete primary support to the excavated surfaces and keep any dewatering system operating. The Contractor shall have qualified personnel periodically check conditions that might threaten the excavation stability.
- 3. Remove excavated soil and rock from the site and dispose of properly at a location secured by the Contractor.
- 4. Remove sheeting used for shoring from the shaft and off the job site. The removal of sheeting, shoring and bracing shall be done in such a manner as not to endanger or damage either new or existing structures, private or public properties and also to avoid cave-ins or sliding in the banks.

#### **B. Tunnel Excavation**

- 1. Excavate in such a manner that over break is held to a minimum.
- 2. Where water inflows in the tunnel face are large and increasing, the Engineer may instruct the Contractor to drill probe holes, relief holes and ground treatment holes in the tunnel face, and to carry out consolidation grouting before proceeding.

3. Whenever tunneling is suspended, complete installation of the primary support for that excavation cycle. Have qualified personnel periodically check conditions that might threaten tunnel stability.
4. Remove excavated rock from the excavation of the TBM erection, transit and reception chambers and dispose of properly at a location secured by the Contractor.

C. Liner Installation

1. The liner plates shall be installed progressively as excavation proceeds. Excavation shall not continue more than 24 inches past the end of the liner plate already in place. At this time an additional section of liner shall be installed before excavation shall continue.
2. Grout shall be placed under pressure in the annular space outside the tunnel as the excavation proceeds. Grout should be continuously placed as close to the heading as possible, using grout stops if necessary. Grout shall be injected in the lower holes first, moving upward as the annular space is filled. Screw type plugs shall be installed after filling each grout hole.

**3.10 VENTILATION AND AIR QUALITY**

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

**3.11 ROCK EXCAVATION IN CASING**

- A. In the event that rock is encountered during the installation of the casing pipe which, in the opinion of the Engineer, cannot be removed through the casing, the Engineer may authorize the Contractor to complete the crossing with a tunnel.
- B. At the Contractor's option, the Contractor may continue to install the casing and remove the rock through the casing at no additional cost to the City.

**3.12 INSTALLATION OF PIPE IN CASING**

- A. After installation of the casing is complete, and has been accepted by the Engineer, install the pipeline in accordance with the Drawings and Specifications.
- B. Check the alignment and grade of the casing and submit a plan to the Engineer for approval to set the pipe at proper alignment, grade and elevation, without any sags or high spots.

- C. The carrier pipe shall be held in the casing by the use of casing spacers. The casing spacers shall be designed by the Contractor such that the pipe can be installed in the casing. Provide a minimum of two casing spacers per length of pipe, unless directed otherwise by the Engineer.
- D. Close the ends of the casing with 4-inch brick walls, plastered with portland cement mortar and waterproofed with asphaltic roofing cement.

### **3.13 INSTALLATION OF PIPE IN TUNNEL**

- A. After the tunnel is complete and has been accepted by the Engineer, install the pipeline in accordance with the Drawings and Specifications
- B. Check the alignment and grade of the tunnel and submit a plan to the Engineer for approval to set the pipe at proper alignment, grade and elevation, without any sags or high spots.
- C. Care shall be taken to prevent damage to the flanges of the tunnel liner plates.
- D. The Contractor shall be responsible for all bad joints including joints disturbed by placing the pipe in the tunnel.
- E. 3000 psi concrete as specified in Section 03300 shall be used for constructing the tunnel invert.
- F. A method approved by the Engineer shall be used to support the pipe so that the weight of the pipe is not resting on the pipe bells
- G. Close the ends of the tunnel with 4-inch brick walls, plastered with portland cement mortar and waterproofed with asphaltic roofing cement.

### **3.14 SHEETING REMOVAL**

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

### **3.15 INTERSTATE RESTORATION**

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

### **3.16 CLEANUP**

- A. Backfill materials shall be as specified in Section 02225. The site shall then be restored to its original condition or better.

**+ + + END OF SECTION 02224 + + +**

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**SECTION 02270****Vegetative Erosion Control and Bank Stabilization****PART 1 – GENERAL****1.01 SCOPE**

- A. The Contractor shall provide erosion control and streambank stabilization including but not limited to fertilizing, seeding, planting, mulching, installation of erosion control fabric, guarantee and maintenance for all disturbed areas shown on the Contract Drawings and in accordance with this specification.

**1.02 REFERENCED SPECIFICATIONS, CODES, AND STANDARDS**

- A. This section is related to the following specification sections.
1. SECTION 02125: Erosion and Sediment Control
  2. SECTION 02273: Riprap
- B. This section references the following commercial standards:
1. “Manual for Erosion Control in Georgia”, published by the Georgia Soil and Water Conservation Commission (4310 Lexington Road, Athens, Georgia 30603), which is available on the Internet as a free download at <http://www.gaswcc.org>.
  2. “Guidelines for Streambank Restoration”, published by the Georgia Soil and Water Conservation Commission (4310 Lexington Road, Athens, Georgia 30603) in cooperation with Metro Atlanta Association of Conservation Districts, USDA Soil Conservation Service (now Natural Resources Conservation Service or NRCS), and the Georgia Environmental Protection Division.

**1.03 CONTRACTOR SUBMITTALS**

- A. General: Submittals shall be furnished in accordance with Section GC-28 – Working Drawings, Shop Drawings, Data on Material and Equipment, Samples and Licenses.
- B. Product Information:
1. Manufacturer’s product information for erosion control fabrics, geotextile fabrics (natural and synthetic fiber) and cellular confinement systems must be provided to the Engineer for written approval, prior to installation on any project site.

2. Information regarding the composition, infiltration rate, and chemical analysis of soil amendments including, but not limited to, fertilizer (natural and synthetic), agricultural lime, plant material compost, leaf or straw mulch, and peat moss must be provided to the Engineer for written approval prior to installation on any project site.
3. Information regarding the species mix and germination rates of erosion control grass seed mixes must be provided to the Engineer for written approval prior to installation on any project site.

C. Certificates:

1. Supplier or manufacturer's certificates, stating the source, quantity, and type of material, shall accompany each delivery. All certificates shall be submitted to the Engineer at the time of delivery. No materials or products shall be left at the project site without first notifying the Engineer.
2. Certificates of inspection of commercial plant material, as may be required by Federal, state, local, or other authorities having jurisdiction, must accompany the plant material shipment and must be submitted to the Engineer at the time of delivery.

D. Samples:

1. Grass seed: two-pound samples of each type of grass seed must be submitted to the Engineer for approval before the bulk grass seed is delivered to the project site. The samples shall be accompanied by a supplier's or dealer's germination rate and percentage of weed seed certifications. The Contractor shall plant the grass seed in test plots designated by the Engineer and analyze the plots for germination rates and weed content. Grass seed shall not be delivered to the project site without written approval from the Engineer. Approval of the seed samples by the Engineer shall not affect the right of the Engineer or Owner to reject the seed upon or after delivery.

E. Reports:

1. Soil Fertility Test: Independent laboratory test results for pH, organic material, texture, soluble salts, nitrogen, phosphorus, potassium, iron and micro-nutrients.
2. Soil Percolation Test: Independent laboratory test results for on-site soil percolation rates defining the infiltration rate through the top 8-



inches of soil. Information to be used to assist in determining irrigation requirements.

#### **1.04 SITE DISTURBANCE MINIMIZATION AND EROSION HAZARD REDUCTION**

- A. The Contractor shall be responsible for minimizing the amount of disturbed area on the site during construction. To accomplish this task the Contractor shall:
1. Install required temporary erosion control measures, as specified on the Contract Drawings prior to initiating any ground disturbing activities within the project site. The Contractor shall notify the Engineer when all temporary erosion control measures have been installed. The Engineer shall, within 24 hours following such notification, inspect all temporary erosion control measures installed by the Contractor. Following inspection the Engineer will notify the Contractor, in writing, that the installation of the temporary erosion control measures meets the Contract requirements and authorize the Contractor to proceed with ground-disturbing activities.
  2. Limit site access to the approved site access locations shown on the Contract Drawings unless otherwise authorized in writing by the Engineer.
  3. Limit the amount of exposed soils, in areas where vegetation removal is required, to the smallest practical area and for the shortest practical time period. See 1.04.B below.
  4. Extract, salvage and store all woody vegetation that has to be removed during construction but which can be replanted following the completion of construction. Salvaged plant material shall be stored in a temporary nursery. The property Owner, in conjunction with the Engineer, shall designate the approved location of the temporary nursery area prior to the initiation of plant salvage activities. The Engineer will review and approve the Contractor's plant salvage methods prior to the initiation of plant salvage activities. The Contractor shall provide temporary irrigation as necessary to maintain healthy plants based on site and climate conditions at the temporary nursery location.
  5. Salvage and stockpile onsite soils removed during clearing and grading activities and designated as suitable for reuse within the project site. All salvaged soil shall be covered with erosion control fabric or plastic to prevent wind or rainfall induced erosion. Protective covering shall be anchored around the edges of the

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stockpile area using sandbags or other anchoring systems as approved by the Engineer.

6. Protect all vegetation within the project site that has not been specifically identified for removal or that is outside of any areas designated for clearing, grading, or construction activities. Vegetation to be preserved shall be identified and clearly marked using florescent pink or florescent orange flagging (attached to each plant) prior to initiation of clearing, grading, or construction activities.
  - a. Vegetation to be preserved shall include all existing vegetation vital to streambank stabilization that is not within a designated clearing, grading, or construction area.
  - b. Any vegetation providing food and/or critical habitat for any species listed as rare, threatened, or endangered by any Federal or state agencies shall be preserved. Such vegetation shall not be located within any areas of the project site designated for clearing, grading, or construction activities.
  - c. All vegetation within the delineated boundaries of jurisdictional or regulated wetland areas shall be preserved unless otherwise directed by the Engineer or as identified on the Contract Drawings. Any impacts to vegetation within delineated wetland area caused by or related to clearing, grading, or construction related activities within the project site shall be mitigated in accordance with applicable Federal, state, and/or local regulations. The Contractor shall be responsible for insuring that any Federal, state, or local permits required to alter delineated jurisdictional or regulated wetlands have been acquired and are included as part of the Contract Documents.
7. The Contractor shall establish all clearing limits within the project site in accordance with Contract Documents. Clearing limits shall be delineated in the field using “Hi-Vis Barrier Fencing” (available through Forestry Suppliers, Inc., 205 West Rankin Street, Jackson, MS 39201) or authorized substitute.
  - a. The barrier fence shall be installed by attaching the fence material to 6-foot metal fence posts driven into the ground a minimum of 2 feet at 6-foot intervals along the edge of those areas within the site that are not designated for clearing, grading, or construction related activities. The barrier fence shall be attached to the fence posts using loops of No. 9 wire; three loops spaced equidistant along each fence post.

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- b. The Contractor shall install barrier fence around all areas where existing vegetation is to be preserved or protected. Barrier fence is reusable and shall be removed after all construction-related activities within the project site have ceased or as directed by the Engineer.
- B. The Contractor shall notify the Engineer when ground-disturbing activities have ceased within an area of the site where all construction activities (excluding those activities inside of structures) has been completed. This notification shall occur within 24-hours following the completion of ground-disturbing activities. The Engineer shall inspect those areas and notify the Contractor, in writing, that the Contractor shall apply erosion control seed/mulch mixtures to reduce or eliminate erosion hazards within those disturbed areas. The Contractor shall, within 24-hours after receiving notification from the Engineer, apply erosion control seed/mulch mixes in accordance with the Contract Documents.

## 1.05 ACQUISITION OF PLANT MATERIALS

- A. The Contractor shall obtain all live plant materials (cuttings and whole plants) from local plant suppliers (nurseries, landscaping companies, plant collectors, etc.). All live plant material shall be from plant stocks grown within a 50-mile radius of the project site. Locally grown or harvested plant materials are generally better adapted to local growing conditions and tend to be more resistant to plant diseases and climatic variations than plants grown or plant materials harvested from outside the local area of the project.
  - 1. If the Contractor is unable to obtain the specified plant materials from the local area the Contractor shall notify the Engineer in writing regarding the inability to obtain specified plant material. The Engineer shall notify the Contractor in writing regarding authorized plant material substitutions or alternative sources.
- B. The Contractor shall abide by all Federal, state, and local regulations regarding the collection of plant materials. The Contractor shall be responsible for obtaining all required collection permits (or shall insure that the Contractor's plant material supplier has obtained all required collection permits) from any and all Federal, state, or local jurisdictions with permitting or regulatory authority regarding plant material collection.
  - 1. In addition to any and all Federal, state, and local permits or authorizations the Contractor shall insure that any plant materials collected on private property were obtained with written permission or authorization from the property owner.

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- C. All plant materials (cuttings or whole plants) collected from natural (non-nursery) locations shall be collected during the time period when those plants are dormant. All whole plants collected from natural (non-nursery) settings shall be collected in such a manner as to protect the plant's root system from a distance 3 inches to 6 inches outside the drip line of the plant to the stem and to a depth equal to or slightly greater than the radius of the drip line. All whole plants collected from natural (non-nursery) settings shall have the excavated root ball wrapped in burlap (tied with twine) to protect the root system.

## **PART 2 – PRODUCTS**

### **2.01 FERTILIZER**

- A. The Contractor shall have the native soil, within the project site and in those areas where plant materials (cuttings or whole plants) will be installed, tested to determine if fertilizers need to be added to the soil to assure viable plant growth and survival. The addition of fertilizer to the soil will not be required except in those soils with test results indicating low soil fertility or low organic content.
- B. The Contractor shall ameliorate natural soils with low soil fertility values with commercial, chemical type fertilizer, which has a certified composition of 10 percent nitrogen, 10 percent available phosphoric acid, and 10 percent soluble potash (10-10-10). Any chemical fertilizers added to the native soils shall be of a type that conforms to all applicable Federal, state, and local laws and regulations. Fertilizer shall be applied at a rate of 500 to 700 pounds per acre. The Contractor shall supply the fertilizer in one of the following forms:
  - 1. A dry free-flowing granular fertilizer, suitable for application by an agricultural or commercial grade fertilizer spreader.
  - 2. A soluble form that will permit complete suspension of insoluble particles in water, suitable for application by a power sprayer (or commercial hydro-seeder).
  - 3. A homogenous pellet, suitable for application through a "Ferti-Blast™" gun or other similar device.
  - 4. A tablet or other form of controlled release with a minimum one-year release period.
- C. The Contractor shall be responsible for assuring the application of fertilizers is consistent with Federal, state, and local laws and regulations particularly in those areas within 25 feet of open water or wetland ecosystems.

- D. The Contractor shall provide the fertilizer in the form specified by the Contract Documents or as directed in writing by the Engineer.
- E. The Contractor may, with written authorization from the Engineer, use natural, composted materials to elevate low soil fertility. The Contractor shall provide the Engineer with the results of soil fertility tests conducted to evaluate the fertility of the native soil/organic compost mixture.

## 2.02 LIME

- A. The Contractor shall apply agricultural lime to the native soils unless soil test results indicate that the addition of agricultural lime is unnecessary. The Contractor shall provide the Engineer with test results indicating the application of agricultural lime is unnecessary. Agricultural lime shall be of a standard manufacture, flour grade, meeting the requirements of ASTM C-602.

## 2.03 WHOLE LIVE PLANTS

- A. The following describes the types of whole live plants that may be required as a part of this contract.
  - 1. Seedlings: Plants grown from cuttings, seeds, or other approved propagation methods (i.e., air rooting). These plants do not normally show form characteristics of the species and are generally less than three years of age and less than 24 inches in height. Measurement for purposes of payment or design is in 3-inch height increments.
  - 2. Whips: Bareroot, broadleaf trees, generally unbranched and between 2 feet and 6 feet in height. Measurement for purposes of payment or design is in 1-foot height increments.
  - 3. Broadleaf Trees: Branched deciduous trees over 6-feet in height. Measurement for purposes of payment or design is by mainstem diameter or in 1-foot height increments.
  - 4. Coniferous Trees: Coniferous trees over 2 feet in height. Measurement for purposes of payment or design is in 1-foot height increments.
  - 5. Shrubs: Typically multi-stem or single-stemmed plants species that are less than 30 feet in height at maturity. Shrubs used in restoration projects are typically between 2-foot and 4-foot in height when delivered to a project site. Shrubs can be either delivered with a burlap wrapped root ball or in containers ranging from a 1-

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gallon to 5-gallon size. Measurement for purposes of payment or design is typically by container size or in 1-foot height increments.

6. Groundcover Species: Typically low growing or prostrate plants delivered to a project site in 4-inch, 6-inch, 10-inch, or 1-gallon size nursery pots. The species can vary from woody to herbaceous plants. Measurement for purposes of payment or design is typically based on container size.

## 2.04 MULCH AND OTHER AMENDMENTS

- A. Bark or Wood Chip Mulch: Bark or Wood Chip Mulch shall be derived from pine or hemlock species. Local hardwood species can be used with authorization from the Engineer. The mulch shall be ground so that a minimum of 95 percent of the material by loose volume will pass through a 1.5-inch mesh screen (sieve) and no more than 55 percent of the material by loose volume will pass through a ¼-inch mesh screen (sieve). The mulch shall not contain any resin, tannin, or other compounds in quantities that would be detrimental to plant life, water quality or aquatic organisms.
- B. Wood Cellulose Fiber Mulch: Wood Cellulose Fiber Mulch shall be used, as part of the hydro-seeding application shall be a fibrous wood cellulose product produced and marketed specifically for use in hydro-seeding applications. Mulch shall be produced from natural or recycled wood fiber such as woodchips, mill wastes, logging slash, or recycled construction wastes.
  1. Mulch shall be free of any rock, plastic, metal, or other non-woody material.
  2. Mulch shall be treated with a non-toxic green dye that facilitates inspection and application. The dye must be certified to contain less than 250 ppm of boron and certified as non-toxic to both plants and animals.
  3. Mulch shall be manufactured in such a manner that after addition to water and agitation in slurry tanks the fibers stay uniformly suspended to form homogenous slurry.
  4. When hydraulically applied to the ground the mulch shall allow the absorption and percolation of water.
  5. Each package of mulch shall be tagged or marked to show dry weight and a certification of at least 93 percent organic content on an oven-dry basis as determined by ASTM 586.

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6. The moisture content of the mulch shall be no greater than 15 percent as determined by oven-dried weight.

**2.05 SEED**

- A. The Contractor shall supply specified seed mixes, which are certified a minimum of 95% pure with a germination rate of 80% or greater, to the project site in the supplier's original, unopened bags. The Contractor shall insure that a certification tag is attached to each bag that displays or clearly identifies:
  1. the scientific and common names of the seed,
  2. the species names of all grass, legume, or cover crop seed included in the mix,
  3. the lot number of the mix,
  4. the percentage of weed seed and inert material,
  5. the germination rate, and
  6. the purity percentage.

**2.06 SOD**

- A. Sod shall contain a minimum of 85% perennial grass species adapted to average climatic conditions at the project site. Any proposed substitute grass seed mixes, available in the local market at the time sod is to be installed at the site, shall be submitted to the Engineer for review and approval.
  1. Sod shall be field grown for one calendar year or longer and have a well-developed root structure.
  2. Sod shall be free of thatch, weeds, undesirable plant species, nematodes, diseases, and insect damage.
  3. Sod shall be free of stones larger than 1-inch diameter, large chunks (>1 cubic inch in size) of woody material, and all human-made products such as plastic, glass, metal objects, and concrete.
  4. Prior to harvest the sod shall be green, in an active and vigorous state of growth, and mowed to a height not less than ¼-inch and no greater than 1-inch.

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5. Sod shall be cut in rectangular pieces with straight edges. Any sod with torn ends or irregular edges shall be rejected by the Engineer.

**2.07 TALL WOODEN STAKES**

- A. These shall be untreated wooded stake or poles, preferably cedar, 5 feet to 8 feet in length, and either nominally 2-inch by 4-inch dimension lumber or 3-inch diameter poles.

**2.08 TACKIFIER**

- A. Tackifier used in hydro-seeding or mulching applications to hold the seed or mulch product to the soil or slope shall conform the following:
  1. Tackifier shall be derived from organic plant sources containing no growth or germination inhibiting materials.
  2. When combined with water the tackifier shall have the property of even dispersion and suspension and shall blend evenly in slurry (i.e. a water and wood cellulose fiber mix).
  3. Tackifier shall be mixed with a dyed wood cellulose fiber at a rate of 150 pounds of fiber per acre to monitor application rates and coverage.

**2.09 EROSION CONTROL FABRICS/GEOSYNTHETICS**

- A. Acceptable erosion control products include:
  1. Jute Matting Or Coconut Fiber (Coir) Matting - Natural fiber products that are woven into a fabric that is typically produced in widths ranging from 4 feet to 16 feet (or more) and delivered to the end user in rolls. These materials are generally rolled out over an area of disturbed soil to stabilize the soil, reduce splash erosion, and provide a seedbed for the erosion control seed mix. This product shall be anchored using nine-inch 2-legged wooden or metal staples or as otherwise specified by the product manufacturer.
    - a. Jute matting or coconut fiber matting shall be provided in rolls that are 4 feet (48 inches) wide and 50 yards (150 feet) with finished edges on the long sides.
    - b. The matting shall be a woven material made of twisted, unbleached "yarn" with a weave opening of ¼-inch to ¾-inch square.



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- c. Selected materials used shall be consistent with the site conditions, anticipated runoff velocities, soil characteristics, and rainfall intensities. The Engineer prior to procurement and delivery to the site shall approve selected materials.
- d. All manufacturers' specifications shall be provided to the Engineer for approval.

2. Erosion Control Blanket

Manufactured product combining two layers of woven synthetic material with a layer of straw, coconut fiber, shredded bark, or wood fiber (excelsior) sandwiched between the synthetic fabric layers. This product is manufactured in rolls of varying widths and lengths and is available from a variety of manufacturers and suppliers. Acceptable manufacturers include Belton Industries, North American Green, and CSI Geosynthetics. Products vary in specification and shall be selected based on their applicability to the project site conditions. Product is anchored using nine-inch, 2-legged wooden or metal staples or as specified by the product manufacturer.

- a. Selected material used shall be consistent with the site conditions, anticipated runoff velocities, soil characteristics, and rainfall intensities.
- b. All manufacturers' product specifications shall be provided to the Engineer for approval.

3. Plastic (Polyethylene) Sheeting

This product is used to temporarily cover exposed soils to prevent erosion or to cover areas where seed has been applied but temperatures are below germination levels and surface erosion risk is moderate to high. This product is generally anchored with sandbags.

- a. Plastic sheeting shall be clear and a minimum thickness of 6 mils.
- b. Refer to Specification Section 02125 for additional specifications.

4. Cellular Confinement System

The cellular confinement system shall meet or exceed the following specifications:

- a. Expanded Dimension      8 feet x 20 feet
- b. Collapsed Dimension      11 feet 5 inches by 5 inches

- c. Panel Thickness (Nominal) 0.047 inches
- d. Panel Weight 57 pounds (deeper cells weigh more)
- e. Individual Cell Depth 4 inches (other depths available)
- f. Cell Area 38 square inches
- g. Cell Seam Node Pitch 13 inches
- h. Welds per Seam 3
- i. Seam Tensile Peel Strength 225 PSI
- j. Installation Temp. Range -16 degrees to 110 degrees F.
- k. Polymer Material HDPE (High Density Polyethylene)
- l. Color Black
- m. Carbon Black Content 2%
- n. Chemical Resistance Superior

## 2.10 WARRANTY

- A. The manufacturer shall warranty that the products under this specification are free from defects in materials and workmanship. The manufacturer and/or supplier shall agree to replace all defective materials without charge. The manufacturer shall have the right to inspect all materials identified by the purchaser as defective to determine probable cause or defect prior to replacement. The supplier shall provide the Engineer with specification tags for a cellular confinement system products delivered to the project site.

## PART 3 – EXECUTION

### 3.01 GENERAL

- A. Weather Conditions:
  - 1. The Contractor is responsible to monitor weather conditions and weather forecasts to ensure that no areas of exposed soil shall be developed unless the appropriate erosion control measures can be implemented within 12 hours prior to a predicted rain event.

2. No seeding, fertilizing, or mulching shall be done:
  - a. when wind velocity exceeds 4 mph
  - b. within 12 hours after rain
  - c. when ground is frozen
  - d. if compacted soils have not been scarified prior to application

B. Soil Preparation:

1. The ground to be seeded or planted shall be graded in conformance with the Contract Drawings unless otherwise directed by the Engineer.
2. The ground shall be scarified (loosened) to alleviate compaction and manipulated to remove large rocks (>3-inch diameter), roots or pieces of wood (>24 cubic inches) and all human-made materials exposed within the seeding, planting, sod installation, and/or erosion control fabric or cellular confinement system placement areas.
3. The Contractor may leave larger rocks and roots or pieces of woody debris if authorized by the Engineer or as shown on the Contract Drawings.

C. Grading and Shaping:

1. All slopes steeper than 4:1 shall be graded and shaped to promote plant establishment.
2. All areas where over-excavation is specified to allow incorporation of soil amendments, the Contractor shall notify the Engineer within 24 hours prior to final over-excavation grading and prior to the incorporation of any soil amendment products.
3. No soil amendment products shall be added to the native soil material until the Engineer approves the amendment.
4. Final grades shall be the elevation of the ground as shown on the Contract Documents after all soil amendments have been added.
5. The Contractor shall notify the Engineer within 48 hours prior to completion of final grading.

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6. Final grading shall be inspected and approved by the Engineer. Unless otherwise authorized the Contractor shall not commence seeding, sod installation, erosion control fabric placement, installation of cellular confinement systems, or construction of bank stabilization measures until the final grading has been approved.

D. Soil Amendments:

1. Prior to seeding any areas the soil will be tested to determine the need for the addition of agricultural lime, organic compost, and/or fertilizers. The Engineer will collect the appropriate samples and submit those samples for testing. Results of the testing will be transmitted to the Contractor to allow determination of soil amendment needs.
2. Soil amendments such as fertilizer, lime, and mulch may be added separately as in the Dry Method described below (see Section 3.02) or incorporated into a water-based homogenous slurry that is applied by hydroseeding methods (see Section 3.03).
3. Soil amendments shall not be applied by water-based slurry on slopes steeper than 3:1.

### 3.02 DRY METHOD SEEDING

- A. Seeding: The Contractor shall notify the Engineer not less than 24 hours in advance of any seeding operation and shall not begin work until area prepared or designated for seeding have been approved. Following approval by the Engineer, seeding shall commence immediately. Seed shall be applied at the specified rate and with the seed mix specified in the Contract Documents. Dry seeding shall be conducted with one of the following procedures:
1. Use an approved blower system with an adjustable disseminating device capable of maintaining a constant measured rate of material discharge that will provide an even distribution of seed at the rate specified and in the area specified;
  2. An approved power-drawn drill or seeder capable of maintaining a constant measured rate of material discharge that will apply an even distribution of seed at the rate specified and in the area specified;
  3. A hand-operated seeder capable of maintaining a constant measured rate of material discharge that will an even distribution of seed at the rate specified and in the area specified; or

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4. By hand broadcasting with frequent assessment of application rates. If hand applications are used the seed shall be incorporated into the upper ¼-inch of topsoil using rake or other method approved by the Engineer.

Any reseeding ordered by the Engineer and not considered to be the Contractor's responsibility shall be performed by the Contractor and Payment made at unit contract prices for the areas reseeded.

- B. Fertilizer: Fertilizer shall be applied in accordance with the procedures and requirements specified for seeding in Section 3.02.A. Fertilizer shall be placed at the rate and composition specified.

1. If specifications are not provided on the Contract Documents, fertilizer application rates and composition shall be determined by the results of a certified soil nutrient analysis.
  - a. The Contractor shall collect soil samples from within the project area and from stockpiles of soils imported to the site prior to initiating construction.
  - b. The Contractor shall submit the samples to a certified testing facility for soil nutrient analysis.
  - c. The Contractor shall forward the results of the soil nutrient tests along with recommended fertilization rates to the Engineer for review and approval.
2. Aerial or broadcast application of fertilizer application within 25 feet of the edge of an open, flowing or still, body of water or wetlands shall be prohibited.
3. Spot applications of fertilizer may be made, as necessary, within 25 feet of open water or using equipment other than aerial application equipment or blowers. Caution shall be exercised when applying fertilizer adjacent to a water body or wetland because of the risks of adversely impacting water quality (and aquatic organisms).

- C. Mulch Application: Specified mulch shall be spread evenly at the specified rates or 1,500 pounds over seeded areas within 24 hours after seeding unless otherwise directed by the Engineer.

1. Distribution of straw mulch shall be by means of an approved type mulch spreader, which utilizes forced air to blow mulch on seeded areas. In spreading straw mulch, the Contractor shall not use equipment that chops the straw into short (less than 6 inch) stalks.

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2. In areas that are not accessible by mechanized mulching equipment, the Contractor shall mulch the area using hand methods approved by the Engineer.

### 3.03 HYDROSEEDING

- A. Equipment: Hydroseeding is a method of applying a slurry-mixture that may contain grass seed (and/or the seeds of other native plants), fertilizer, wood cellulose fiber (dyed), tackifier, and water. The components of a hydroseed mix shall be mixed in tank (part of an approved hydroseeder) that uses water as a carrying agent and maintains continuous agitation and circulation through the use of internal mixing paddles (inside the mixing tank). The mixture shall be homogenous and dischargeable through a nozzle.
  1. The approved hydroseeder shall have sufficient tank capacity to be able to cover ½-acre of seeding area per tank load.
  2. The tank shall have a discharge system capable of discharging slurry at a continuous, uniform, specified application rate at a distance of 500 feet horizontally from and at an elevation difference of 150 feet vertically above the hydroseeder.
  3. Discharge lines shall be large enough to prevent blockage as slurry passes through the lines.
  4. The hydroseeder shall be equipped with discharge spray nozzles that will provide a uniform distribution of the specified slurry.
  5. The Engineer shall inspect and authorize use of any hydroseeder delivered to the project site prior to the Contractor initiating any hydroseeding activity.
- B. Mixture: The following mixture shall be used unless an alternate is approved by the Engineer:
  1. Proportions per acre are:
    - a. 2,500 pound of wood cellulose fiber mulch,
    - b. 120 pounds of tackifier or soil stabilizer,
    - c. 60 pounds of fertilizer (or more if soil nutrient tests indicate a high nutrient need),
    - d. 3,000 gallons of water, and

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- e. Grass seed, using the specified seed mix and application rates.
2. Preparation: As the mixture components are being placed in the tank the agitator should be running at a slow to medium speed to assure good blending of the materials and a complete homogenous mixture of the ingredients.
- a. fill the tank 1/3 full of water,
  - b. add ½ of the total amount of tackifier or stabilizer needed,
  - c. add three 50 pound bales of wood cellulose fiber,
  - d. add ½ the total fertilizer required.
  - e. add enough water to bring the tank to half and increase the speed of the agitator to a fast speed.
  - f. add remaining 200 pounds of wood cellulose fiber when the tank is ¾-full.
  - g. add remaining tackifier and fertilizer.
  - h. add remaining water and begin immediately to apply slurry to areas designated for seeding.
- C. The grass seed to be used for this project shall be specified Contract Documents, in pertinent Special Provisions, or by the Engineer following consultation with a local agronomist or landscape architect.
1. Application:
- a. All of the slurry prepared must be applied within two hours following the start of mixture preparation.
  - b. Slurry shall not be applied if there is a forecast for rain within 3 days following application.

### 3.04 SOD PLACEMENT

- A. Sod Placement Period: Sod placement will be authorized by the Engineer after consultation with a local landscape architect or landscaping company to determine the earliest and latest start dates that will allow for a

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reasonable chance of success when sod is installed. The installation may start as early as May 15<sup>th</sup> and should be completed prior to November 1<sup>st</sup> each year.

- B. Designated Sod Placement Areas: Sod shall be placed in areas as designated on the Contract Drawings or as directed by the Engineer.
- C. Sod Placement Procedures: The Contractor shall notify the Engineer a minimum of 48 hours prior to sod installation to allow an inspection of the prepared areas. The Contractor is responsible for insuring the sod placement area has smooth scarified soils, is properly graded, has an appropriate soil moisture prior to sod placement, and is free of larger rock (>2-inches diameter), woody debris, and human-made products.
  - 1. On long steep slopes sod shall be laid perpendicular to the fall line of the slope.
  - 2. In ditches sod shall be laid at right angles to the flow line.
  - 3. When required, or as directed by the Engineer, sod sections placed on steep slopes shall be pinned using 2 anchoring pins on each side of the sod section.
  - 4. All air pockets shall be removed from under the sod by trampling or rolling with a compacting roller.
  - 5. Frayed ends of sod sections will be removed. Holes in sod area shall be patched with new, undamaged sod.
- D. Finishing: The Contractor shall insure the sod installation results in smooth parallel rows tightly packed together and in a relatively straight line. Sod sections shall be placed immediately adjacent to one another, as tightly packed together as possible. All joints shall be butted tightly together and staggered laterally. Sod sections shall not be stretched or reduced in size so they will fit.
- E. Watering: Irrigation may be required in sodded areas installed during the warmer, drier periods of the year. The Contractor shall have appropriate temporary irrigation equipment on site prior to starting the installation of sod. Irrigation of the sod shall commence at the end of the first day sod placement is initiated. Watering shall be provided at a rate of 1.5-inches per week (7 days). Watering shall, be the responsibility of the Contractor.

### 3.05 EROSION CONTROL PLAN IMPLEMENTATION

- A. Silt Fence Installation: Silt fence shall be installed as shown on the Contract Drawings, as described in the Temporary Erosion and Sediment



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Control Plan (TESCP) or as directed by the Engineer. Silt fence shall be installed a minimum of 48 hours prior to the time the Contractor initiates construction activities (i.e. clearing, grubbing, and grading).

- B. Erosion Proofing Ingress/Egress Points: The Contractor shall place quarry spalls at all ingress/egress points on the site that are transitions for pavement to grassed or bare native soil. These transition areas will be 24 feet long and 12 feet wide. The Contractor shall place a geo-textile on the native soil prior to placing quarry spalls to prevent spalls from being pushed into the ground during wet site conditions.
- C. Application of Straw Mulch: See Section 3.02.C.
- D. Erosion Control Blankets:
  - 1. Placement:
    - a. Biodegradable erosion control blanket shall be used on all slopes 4H:1V and steeper.
    - b. The erosion control blanket shall be spread only on prepared, fertilized and seeded surfaces.
    - c. On all slopes, the erosion control blanket shall be laid up-and-down the slope in the direction of water flow.
    - d. Waste of erosion control material shall be minimized by limiting overlaps as specified and by utilizing the full length of the netting at roll ends.
    - e. The erosion control blanket shall also be used on flatter areas where surface soil protection is considered critical to the establishment of vegetation and stabilization of erosive forces (i.e. water, wind, raveling, drying, etc.).
    - f. Proper selection of materials is critical for specific slopes and slope distances. No one product is applicable for all situations. The erosion control products should be selected on a case-by-case basis in consultation with the manufacturer.
  - 2. Anchoring Process:
    - a. Ends and sides of adjoining pieces of material shall be overlapped 6-inches and 4-inches respectively and stapled. Six anchors shall be installed across ends. A common row of staples shall be used at side joints. Staple through both blankets, placing staples approximately 6-inches apart.

- b. The top edge of the erosion control blanket shall be anchored in a 6-inch deep by 6-inch wide trench. Backfill and compact trench after stapling.
- c. Anchorage shall be by means of 9-inch long, two-legged staples driven vertically and full-length into the ground. The legs shall be spread 3 inches to 4 inches apart at the ground to improve resistance to pullout. In loose soils the use of 18-inch metal/washer pins may be required to properly anchor the blankets.
- d. All 3:1 or greater slopes shall be stapled with 2 staples per square yard in a triangular pattern. Staples shall be installed per the manufacturer's recommended staple pattern guide.
- e. The erosion control blanket shall not be stretched, but should be laid loosely over the ground to avoid the blanket being pulled downslope.
- f. The erosion control blanket shall not be rolled out onto ground containing frost within the 9-inch penetration zone of the anchorage staples. Further, no stapling shall be undertaken while any frost exists within the staple penetration zone.
- g. Refer to Specification Section 02125 – Erosion and Sedimentation Control for additional product requirements.

### 3.06 BANK STABILIZATION

#### A. Brush Mattress:

1. General Description: Brush mattress stabilization system is a combination of living material that forms a protective cover of vegetation over a relatively shallow slope (flatter than 2H to 1V gradient). The eroding surface shall be protected by placing layers of live branch cuttings directly on the slope with the basal ends of the cuttings located at or very near the toe of the slope and the growing tip oriented up the slope parallel to the fall line. Live stakes interspersed in the brush mattress shall be used as anchor points for tying a network of heavy duty landscaping twine to bind the brush mattress to the slope. In addition the toe of the treated slope shall be protected with either live or dead fascines anchored into the slope using stout stakes.

## 2. Construction Requirements:

- a. Preparation Time: Live branch cuttings shall be collected locally and within 5 days prior to planned installation. Live cuttings shall be stored in a cool, shaded area to avoid desiccation. Live stakes and live fascines (bundles of live branch cuttings) shall be prepared immediately (within 1 day – 24 hours) prior to installation.
- b. Planting Period: Plants shall be planted when willows or other suitable species used are dormant. This period extends from the time the leaves start to turn yellow in the autumn to the time new growth starts in the spring.
- c. Construction Sequence:
  - 1) Anchor the lower edge of the brush mattress in a trench, using a fascine to anchor and protect the lower bank edge from undermining.
  - 2) Place live branches on slope with butt ends pushed into soil below the mean high water level with growing tips placed at a slight angle in the direction of stream flow.
  - 3) Branches shall be placed to give coverage of approximately 4 branches every 6 linear inches.
  - 4) Pound wooden stakes to ½ their length into soil between branches 3-feet on center.
  - 5) Wrap wire or jute (heavy duty landscaping twine) around stakes and over branches as tightly as possible.
  - 6) Once the twine or wire has been placed and made as tight as possible by hand, pound wooden stakes further into the ground to tighten the wire or jute and compress branches to slope.
  - 7) Tamp live stakes between wooden stakes.
  - 8) After fascines and branches are installed, place soil on top slightly exposed material. Fill voids between the branches of the brush mattress with loose soil to promote rooting.]

**B. Branch Packing:**

3. General Description: Branch packing is a process of placing alternating layers of live cuttings and soil in a hole, gully, or slump area in a slope or streambank. Live cuttings shall be oriented so the growth end points out of the hole, gully, or slump area and the basal end is embedded into the native soil. The layers of live cuttings shall be placed at approximately a 20-degree to 30-degree angle above horizontal with the growth end higher in elevation than the basal end. In large hole, gully, or slump areas dormant posts or tall wooden stakes shall be installed vertically, within the area being stabilized, in a pattern designed to allow a network of heavy landscaping twine to be tied to the vertical posts and over the top of the last live branch layer to hold that layer in place. The last layer of live branch cuttings shall be covered with soil. In addition, the vertical posts or stakes add horizontal stability to the layers of live cuttings.
4. Construction Sequence:
  - a. Begin at the lowest point, drive stakes 3 to 4 feet vertically into the ground. Set the stakes 1 to 1.5 feet apart.
  - b. Place an initial layer of branches 4 to 6 inches thick at the bottom between the vertical stakes. Place additional branches in a crisscross pattern covering the entire surface of the layer. Add a layer of soil no thicker than 120 inches and compact it.
  - c. The thickness of the layer shall be determined by the steepness of the slope (thinner when steeper) and/or problems with bank seepage.
  - d. Growing tips of branches shall protrude slightly from the filled surface to retard velocity and filter sediment.
  - e. Growing tips of branches shall protrude slightly from the filled surface to retard flow velocity and filter sediment.
  - f. Install a relief drain at the rear of the trench and above the base flow level. Place outlet at or above flow level to protect against further slumping.
  - g. The final installation shall conform to the existing slope.

**B. Brush Layering:**

1. General Description:

- a. A layer of soil shall be wrapped in a coir fabric to form an approximately 12-inch thick “soft gabion” which shall be placed over the layer of live cuttings. More live cuttings shall be placed on top of the soft gabion and another soft gabion shall be placed on top of those cuttings and so on.
- b. Alternating layers of live cuttings and soft gabions shall be installed so the face of the gabions forms a slope ranging from 1H:1V to 3H:1V. The live cuttings shall protrude out of the soft gabion reinforced slope face approximately 2 to 3 feet.
- c. Brush layering/soft gabion systems over 7 feet in height and 20 feet in length shall have an Engineering analysis for completed determine slope stability prior to construction. The Contractor shall be consult with the Engineer prior to initiating construction of a vegetated soft gabion wall. The Contractor shall be responsible for collecting slope and soil stability information at slope or bank restoration sites where brush layering/soft gabion systems are proposed for installation.

2. Construction Sequence:

- a. The slope shall be prepared by excavating a native soil bench at the lowest elevation of the affected area. In the case of a streambank that is typically at the ordinary high water mark.
- b. The bench shall be constructed the full length of the effected area and shall be reinforced at the toe of the effected area using rock or dead plant cutting fascines to protect the toe from additional erosive forces. The bench shall be cut into the slope approximately 4 to 6 feet at a downward angle of approximately 5-degrees. The back slope of the treatment area is shall be cut at 0.5 to 1 or steeper.
- c. Soil excavated from the treatment area during the construction of the bench shall be stockpiled in an area designated by the Engineer. This soil shall be mixed with fertilizer and mulch.
- d. Live branch cuttings; shall be collected locally, brought to the project site, inspected and approved by the Engineer. Following acceptance by the Engineer, the Contractor shall

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place the bundles of live cuttings in close proximity to the work area. The Contractor shall protect the cuttings from animal damage and desiccation.

- e. After excavation has been completed, the soil has been removed and the treatment area has been prepared and a layer of live cuttings shall be placed in the bottom of the cut bench and covered with native soil. The basal end of the cuttings shall be pushed into the soil at the vertical slope to provide contact with groundwater. The basal end of the cuttings shall be placed into the treatment area so they are oriented perpendicular to the slope face. The growth end of the cuttings shall protrude from the bank approximately 2 to 3 feet. There shall be 8 to 12 live cuttings per linear foot of bench in each brush layer.
- f. After the brush layer has been placed, roll out the coir fabric over the top of the live cuttings, insuring the selvage edge on one side of the roll is against the back slope of the cut-bench. Lay the remaining width of the material out so  $\frac{1}{2}$  the fabric width is laying flat and the other  $\frac{1}{2}$  is bunched up and laying on the live cuttings outside of the area where soil is to be placed.
- g. With the soft gabion fabric in place, add a layer of soil 14 inches to 16 inches thick (loose) and compact to a layer 10 inches to 12 inches thick. Containment boards shall be used to contain the outer edge or nose of the soft gabion and prevent soil from being cast down the slope or into the water.
- h. After the soil has been compacted roll the  $\frac{1}{2}$  of the fabric that was not covered by the soil over the top of the soil to form a coir pillow or soft gabion filled with soil.
- i. Using dead stout stakes anchor the selvage edges of the fabric into the back wall of the cut-bench area. The Contractor shall exercise care when anchoring the ends of the soft gabion to avoid having soil emigrate out of the soft gabions and to reduce the risk of failure at the ends of the gabions.
- j. During dry weather conditions the Contractor shall irrigate each brush layer/soft gabion combination.
- k. The Contractor shall continue steps (e) through (i) until the desired elevation has been reached and the bank or slope stabilization area is fully treated.

C. Cellular Confinement Systems:

1. General Description: The cellular confinement system is a three dimensional system used for soil stabilization. It is defined as a series of symmetrical shaped cells joined together sharing common walls such that the final system confines infill material within the cells and reduces both vertical and lateral movement.
2. Construction Sequence:
  - a. The Contractor shall verify site conditions are as shown on the Contract Drawings. Notify the Engineer if site conditions are not acceptable. The Contractor shall not begin preparation or installation until unacceptable conditions have been corrected or the Engineer has authorized initiation of work.
  - b. The Contractor shall install the cellular containment system according to standard practices recommended by the manufacturer in accordance with the purpose of the application.
  - c. The Contractor shall prepare the subgrade in accordance with manufacturer's specifications. Excavate or fill foundation soils so the top of installed cellular confinement system is flush with or slightly lower than adjacent terrain or final grade.
  - d. Anchor cellular confinement sections at crest of slope. Use type of anchor and frequency of anchoring indicated on the Contract Drawings or as directed by the Engineer or per the Manufacturer's specifications.
  - e. Expand cellular confinement sections down slope. Ensure each Geoweb section is expanded uniformly to required dimensions and outer cells of each layer are correctly aligned. Interleaf or overlap edges of adjacent sections in each layer, according to which sidewall profiles abut. Ensure upper surfaces of adjoining Geoweb sections are flush at joint and adjoining cells are fully anchored. Anchor with specified anchors per manufacturer's recommendations.
  - f. Place infill in expanded cells with suitable material handling equipment, such as a backhoe, front-end loader, conveyor, or crane-mounted skip. Limit drop height to a maximum of 1 m (3 feet). Avoid displacement of cellular confinement

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sections by infilling from the crest to toe of slope. Overfill and compact infill in accordance with consistency of material and cell depth as follows: overfill screened topsoil between 25 50m (1 to 2-inches) and lightly tamp or roll to leave soil flush with top edge of cell walls. Apply specified surface treatment.

E. Live Staking:

1. Construction Sequence:

- a. Plants shall be planted when willow, or other species suitable for use in vegetated riprap projects, is dormant. This period extends from the time the leaves start to turn yellow in the autumn to the time new growth starts in the spring. The Contractor shall schedule plant material installation for early spring just before the plants come out of the dormancy period.
- b. Prior to installation the Contractor shall dip the butt end of all plant specimens (i.e. live stacks) into a liquid mycorrhizae root dip gel (rooting hormone with soil bacteria) to stimulate root growth.
- c. Live stakes shall be planted right side up with the butt ends planted into the ground. In order to identify the top of the stakes, the butt ends should be pointed or otherwise marked at the time of cutting. Alternatively the tops of the stakes may be painted with a water-soluble latex paint.
- d. The Contractor shall ensure that live stakes are to be planted as deep as possible. About 80 percent of the stake shall be inserted into the ground. The Contractor shall avoid stripping the bark or bruising the stake. The Contractor shall not pound the stakes with an ax or sledge. In hard ground the Contractor shall use an iron bar to prepare holes for the cuttings.
- e. The Contractor shall tamp soil around the live stakes after they have been placed into the ground. The live stakes shall be firm in the ground so that they cannot be easily moved or pulled out. ]

### 3.07 IRRIGATION (WATERING)

- A. Short-term Irrigation: Trees and shrubs shall be thoroughly soaked after planting and provided with additional water at intervals necessary to



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provide for good health and growth of the planting. The Contractor shall be responsible for ensuring that adequate short-term irrigation is provided for the project.

1. The Contractor is responsible for providing water for irrigation and must adhere to all related legal and permit requirements.
2. Upon completion of planting, all planted and seeded areas within the project site shall be soaked to saturation by a fine spray. The new plantings and seedings shall be watered by an on-site sprinkling system during dry weather or whenever necessary for proper establishment of the planting and/or seeding until final project acceptance.
3. At no time shall the planting be allowed to dry out.
4. The Contractor shall implement appropriate measures to avoid excessive watering, soil washing (sheet erosion), excessive soil saturation, and/or areas of excess standing surface water.
5. Any damage to soils or plants that result from the Contractor's excessive or irregular irrigation (watering) practices shall be repaired within 24-hours by the Contractor at no additional cost to the OWNER.
6. Long-term Irrigation: The Contractor shall be responsible for providing an appropriate irrigation system to allow for watering of planted and seeded areas, that were constructed during as part of the project.
7. The Contractor shall provide irrigation after the initial construction period and throughout the maintenance and guarantee period. This Contractor responsibility extends to any performance monitoring periods that may be associated with agency permits issued to authorize the project work.
8. The Contractor shall review all short-term and long-term irrigation system proposals with the Engineer to ensure that said systems are adequate. No irrigation systems shall be installed or implemented without review and approval by the Engineer. Approvals from the Engineer shall be obtained 2-weeks prior to the time to begin required irrigation.

### **3.08 MAINTENANCE PRIOR TO ACCEPTANCE**

- A. The Contractor shall maintain the planted areas in a satisfactory condition until final acceptance of the project. Such maintenance shall include the

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filling, leveling, and repairing of any washed or eroded areas, as may be necessary, and sufficient watering to maintain the plant materials in a healthy condition. The Engineer may require replanting of any areas in which the establishment of the vegetative ground cover does not appear to be developing satisfactorily.

1. Plants shall be maintained in a vigorous, thriving condition by watering, cultivating, weeding, pruning, spraying, and other operations necessary. No trees or shrubs will be accepted unless they are healthy and show satisfactory foliage conditions.
- B. At time of acceptance of the completed project, all seeded areas shall be totally established with no bare spots. In addition, all seeded areas shall have no more than 5 percent aerial coverage by non-native invasive plant species and 0 percent aerial coverage by noxious weeds.
- C. At the time of acceptance of the complete project all planted areas shall have a minimum of 85 percent survival of vegetative species (trees, shrubs, perennials).
- D. Vegetation/Pest Management:
1. Maintenance of grass species within the erosion control areas outside a critical wildlife or fish habitat areas shall be undertaken using conventional mowing, trimming, weeding, and other vegetative management techniques.
  2. The Contractor shall remove all noxious weeds and non-native, invasive plant species from within the project areas as regularly as necessary to prevent establishment of any noxious or non-native, invasive plant species.
  3. The Contractor shall be responsible for the removal of animal pest species from the project area if said pest species are adversely impacting the health of the erosion plantings or seedings.
    - a. The Contractor shall submit a plan for pest control to the Engineer detailing the pest problems and the recommended approach for controlling and/or eliminating said pest problems within the project area.
    - b. The Contractor shall, through consultation with appropriate Federal, state, and local agencies, determine the regulatory requirements related to pest control.
  4. Pesticide and herbicide use shall be implemented in accordance with all applicable Federal, state, and local regulations and policies.

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- a. The Contractor shall be responsible for acquisition of all permits and licenses require for use and application of pesticides and herbicides.
  - b. The Contractor shall be responsible for appropriate storage and disposal of all chemical agents used within the project site for the purposes of controlling or eradicating pests or undesirable vegetation.
  - c. The Contractor shall be responsible for all “chain of custody” requirements associated with all chemical constituents used for the control and/or eradication of pest and/or undesirable vegetation.
  - d. The Contractor shall not use pesticides and/or herbicides in critical wildlife and fish habitats (i.e. riparian zones, nesting cover, etc.)
  - e. The Contractor shall employ a licensed pesticide applicator as required by any Federal, State or local laws.
- E. The Contractor shall provide adequate protection to all newly seeded areas including the installation of approved temporary fences to prevent trespassing and damage, as well as erosion control, until the end of the one-year correction period.
- F. The Contractor shall replace any materials or equipment damaged by its employees or subcontractors.
- G. The Contractor shall periodically inspect all erosion control blankets and matting following installation, particularly after rainstorms, to check for erosion and undermining. Any dislocation or failure shall be repaired within 24 hours. If washouts or breakage occurs, the Contractor shall reinstall the material after repairing the damage. The Contractor shall continue to monitor the project until it becomes permanently stabilized.

### **3.09 FINAL INSPECTION, ACCEPTANCE, AND GUARANTEE**

- A. Inspection of seeding and planting work shall be completed at conclusion of the maintenance period.
- B. Written notice requesting inspection shall be submitted to the Engineer and Owner at least 10 days prior to the anticipated inspection date.

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- C. The Contractor shall submit inspection reports and/or maintenance records to the permitting agencies that have the ultimate approval authority with regard to when an erosion control project is successful.
- D. Final acceptance of the work prior to beginning the guarantee period of the contract will be accepted upon written approval by the Engineer and/or Owner, which is based on the satisfactory completion of all work, including maintenance, but exclusive of the replacement of plant material or any required seeding.
- E. The Contractor shall replace, as soon as weather conditions permit, all dead plants and all plants not in a vigorous, thriving condition, which are observed at the end of the one-year correction period.
- F. Plants used for replacement shall be of the same size and variety specified in the Contract Documents unless otherwise directed by the Engineer. Plants shall be furnished, planted, staked, and mulched as specified in the Contract Documents.
- G. At time of final acceptance of the completed project, all seeded areas shall be totally established with no bare spots. In addition, all seeded areas shall have no more than 5 percent aerial coverage by non-native invasive plant species and 0 percent aerial coverage by noxious weeds.
- H. At the time of acceptance of the completed project all areas where bank stabilization techniques were implemented shall have a minimum of 85 percent survival of vegetative species (trees, shrubs, perennials) installed. In addition, the vegetative species (trees, shrubs, perennials) shall provide 85 percent aerial cover.
- I. Prior to final acceptance the Contractor shall provide the Engineer with a written report (with photographs) documenting the condition of onsite plants and seedings. This report shall be used as part of the final project inspection and acceptance.

**3.10 MAINTENANCE/GUARANTEE AFTER ACCEPTANCE**

- A. The Contractor shall be responsible for a period of one year after date of acceptance of all work under the Contract, for all plant replacements including trees, shrub seedlings, perennials and any other portion of the bank stabilization treatment requiring maintenance or replacement.
- B. The work covered by the maintenance and guarantee portions of these specifications consists of providing all replacements of plants, labor, materials, equipment, and supplies and performing all operations in connection with maintenance and guarantees.

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- C. The Contractor shall provide the Engineer and OWNER with a monthly record describing all maintenance activities performed including dates, materials, irrigation schedule and other pertinent activities. The person who actually supervised and/or performed the work shall sign the report.
- D. The inspection of seeded areas is independent of the final inspection and maintenance period.

END OF SECTION

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**SECTION 02273****Riprap****PART 1 – GENERAL****1.01 SCOPE**

- A. The Contractor shall provide stone riprap, including associated earthwork and geotextile filter material, complete and in place, in accordance with the Contract Documents.

**1.02 REFERENCED SPECIFICATIONS, CODES, AND STANDARDS**

- A. This Section references the following Commercial Standards:

Georgia Department of Transportation (GA DOT), Standard Specifications Construction of Roads and Bridges, 1993 Edition

ASTM C 88                      Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

ASTM C 535                    Standard Test Method for Resistance to Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

AASHTO T 85                 Standard Method of Test for Specific Gravity and Absorption of Coarse Aggregate

AASHTO T 210                Method of Test for Aggregate Durability Index.

AASHTO T 134                Optimum Moisture Content

**1.03 CONTRACTOR SUBMITTALS**

- A. The Contractor shall submit samples of all materials proposed to be used in the work in accordance with the requirements in Section GC-28 – Working Drawings, Shop Drawings, Data on Material and Equipment, Samples and Licenses. Sample size shall be as determined by the testing laboratory.
- B. Testing certificates from a qualified testing agency shall be submitted prior to acceptance of the rock source to verify the conformity to the requirements of the Contract Documents. Contractor shall, if requested, coordinate inspection of the rock source by the Engineer.

## PART 2 – PRODUCT

**2.01 STONES FOR RIPRAP**

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

**Type 2** – equivalent to GA DOT specification for “Plain Riprap”:

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

**Type 3** – equivalent to GA DOT specification for “Dumped Riprap – Type 3”:

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

- C. Stones shall consist of durable, sound, hard, angular rock meeting the following requirements for durability absorption ratio, soundness test, and abrasion test:

Durability Absorption Ratio	Acceptability
Greater than 23	Passes
10 to 23	Passes only if Durability Index is 52 or greater
Less than 10	Fails
Durability Absorption Ratio	= $\frac{\text{Durability Index (Coarse)}}{\% \text{ absorption} + 1}$

- D. The durability index and percent absorption shall be determined by AASHTO T 210 and AASHTO T 85, respectively. The minimum apparent specific gravity of the stones shall be 2.5 as determined by AASHTO T 85.
- E. Stones shall have less than 10 percent loss of weight after five cycles, when tested per ASTM C 88.



- F. Stones shall have a wear not greater than 40 percent, when tested per ASTM C 535.
- G. Control of gradation shall be by visual inspection. The Contractor shall furnish a sample of the proposed gradation of at least 5 tons or 10 percent of the total riprap weight, whichever is less. If approved, the sample may be incorporated into the finished riprap at a location where it can be used as a frequent reference for judging the gradation of the remainder of riprap. Any difference of opinion between the Engineer and the Contractor shall be resolved by checking the gradation of two random truckloads of stones. Arranging for and the costs of mechanical equipment, a sorting site, and labor needed in checking gradation shall be the Contractor's responsibility.
- H. The acceptability of the stones will be determined by the Engineer prior to final placement.

## **2.02 GEOTEXTILE FABRIC FILTER**

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

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

- B. Fabric shall be Mirafi Filterweave 403 or approved equal.

## **PART 3 – EXECUTION**

### **3.01 SURFACE PREPARATION**

- A. Surfaces to receive filter materials and riprap, including the toe trench and slope, shall be brought to the line and grade indicated and shall be smooth and firm, free of brush, trees, stumps, and other objectionable material. Where filling of depressions is required or a filled bank is constructed, the new material shall be compacted with hand or mechanical tampers to a minimum of 85-percent of maximum density.
- B. The Contractor shall remove and exclude all stormwater, groundwater and creek or stream water from the excavation. Sump pumps and sand bags or portable dams, diversions, or other approved means, shall be used to remove and exclude water and continuously maintain water level below

the bottom of the excavation. Water shall be removed and excluded until both geotextile filter material and riprap have been placed. Any water removed from the excavation shall not be discharged into any surface stream or other water body unless such discharge meets water quality standards. Removed water may be disposed on-site by land application using sprinklers in an area designated by the Engineer or by discharge into an approved treatment system.

- C. Cleared and excavated materials shall be hauled off site to an appropriate disposal location arranged by the Contractor and at its sole expense unless otherwise indicated or specified.
- D. Riprap installed at the toe of a stream bank below the elevation of the water in a stream to prevent scour from undermining the riprap shall be backfilled and covered with native soil to the original grade. The backfilled native soil shall be compacted with hand or mechanical tampers to a minimum of 80-percent of maximum density.

### **3.02 PLACEMENT OF GEOTEXTILE FABRIC**

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

### **3.03 STONE RIPRAP**

- A. Placement of riprap shall begin at the toe and proceed up the slope. The stones shall be placed, or dumped from a height of not more than three feet and placed with equipment or by hand. Sufficient hand work shall be performed to produce a neat and uniform surface, true to the lines and grades indicated on the Drawings.
- B. Dumped riprap shall be used only where there is an existing road access to the top and/or bottom of the stream bank. Riprap shall be dumped into

place, beginning at the toe and proceeding up the slope, and may be spread using suitable equipment. Care must be taken to prevent damage to the underlying filter material. Sufficient hand work shall be performed to produce a neat and uniform surface, true to the lines and grades indicated on the Drawings.

END OF SECTION

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**SECTION 02399**

**CREEK CROSSINGS**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. Furnish all labor, materials, equipment and incidentals required to complete the construction of the creek crossings as shown on the Drawings and/or specified herein.
- B. The work will include all excavation (except rock), sheeting, furnishing and installing the pipe, concrete encasement, backfilling the trench, rip rap, water handling, diversion of flow, restoring channel and grading and all other work necessary to complete the crossing.

**PART 2 PRODUCTS**

**(NOT USED)**

**PART 3 EXECUTION**

**3.01 CONSTRUCTION METHODS**

- A. The procedure and methods of diking, by-passing or otherwise restricting the flow of the creek during construction, excavating the trench and installing the pipe will be at the option of the Contractor, subject to the review of the Engineer and the requirements of the Contract. Before start of work, the Contractor shall submit a written outline of his proposed methods and supporting data, for review by the Engineer.
- B. Excavation in earth and rock, if encountered for the pipe, shall conform to the requirements specified under Section 02225, Trench Excavation and Backfill. The pipe trench shall be true in grade and alignment, and of sufficient width and depth to provide space for properly laying the pipe.
- C. Backfilling of the pipe shall be done with select excavated granular material. The top 18 inches (minimum) of the trench shall be riprap as specified in Section 02125.
- D. The banks of the creek and areas disturbed during pipe installation shall be restored to their original or better condition in accordance with requirements as specified in Section 02125 and details shown on the Drawings.

- E. Upon completion of the crossing, the creek channel shall be cleaned, the pipe shall be tested and the site cleaned of all debris.

**+ + + END OF SECTION 02399 + + +**

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**SECTION 02491**

**Rehabilitation of Sanitary Sewer Manholes**

**PART 1 – GENERAL**

**1.01 SCOPE**

- A. This specification covers the work necessary to expose and raise existing sanitary sewer manholes to grade and to rehabilitate or replace existing sanitary sewer manholes. All work shall be performed only as directed by the Engineer or shown on the task order Drawings. The Work includes:
  - 1. Sealing to exclude infiltration; and/or
  - 2. Lining of manhole interiors; and/or
  - 3. Removal and replacement of manholes; and/or
  - 4. Replacement and/or removal of broken manhole covers and frames, corroded step irons or corroded ladders.
- B. The Contractor is responsible for field verification of location and condition of all manholes.
- C. The Contractor shall provide all labor, materials and equipment required to clean, raise, or rehabilitate the manholes.
- D. The Contractor shall comply with the City's and OSHA requirements for confined space entry.
- E. No manhole cover slabs shall be removed to undertake the work until prior notice has been given to the Engineer.
- F. Before commencing work at existing manholes, a perforated catch bucket (to retain particulate larger than U.S. No. 8 sieve, for subsequent removal), or similar, shall be fitted to the outgoing pipe from the manhole structure. Contractors shall strictly adhere to the requirement that construction debris and waste material be prevented from entering downstream sewers.
- G. The Contractor shall keep accurate records of the location of and nature of the rehabilitation work performed at each manhole as directed by the Engineer. The Contractor shall provide copies to the Engineer as required.

## 1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. The following references are part of this Specification. In case of conflict between the requirements of this Specification and those of the listed documents, the requirements of this Specification shall prevail. The latest edition of the following references shall be used:
1. ASTM C794 Test Method for Adhesion-in-Peel Elastomeric Joint Sealant
  2. ASTM D412 Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension
  3. ASTM D882 Test Methods for Tensile Properties of Thin Plastic Sheeting
- B. Other ASTM standards as referenced in the Specifications below.

## 1.03 SUBMITTALS

- A. The Contractor shall submit the following information:
1. Written certification by the manhole rehabilitation system manufacturer stating that the applicator is approved to install the rehabilitation system specified. **(At Pre-construction Meeting)**
  2. Manhole rehabilitation system manufacturer's literature describing the rehabilitation system components, rehabilitation material utilized, including the materials' physical and chemical characteristics. **(At Pre-construction Meeting)**
  3. Experience record of a minimum of sixty (60) manholes rehabilitated within the last three (3) years. **(At Pre-construction Meeting)**
  4. Description of installation method including **(At Pre-construction Meeting)**:
    - a. Product Material Safety Data Sheets.
    - b. Maximum pot life, storage life and essential storage requirements of all rehabilitation materials
    - c. Mixing and proportioning requirements (as applicable).



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- d. Environmental requirements for application and worker safety including ventilation, humidity, and temperature ranges.
  - e. Application film thickness per coat of activator and mastic (as applicable).
  - f. Curing time, including specific formulation requirements to provide specified setting time for foamed mastic (as applicable)
  - g. Wastewater flow control plan in accordance with Section 02750.
- B. Methodology, including detail drawing and necessary product data for finishing all anticipated pipe connections to rehabilitated manholes to prevent infiltration and exfiltration (e.g. anticipated pipe connections, including through pipe, side connections and drop connections). In the case of lining, such details shall be provided by the liner manufacturer or approved in writing by the liner manufacturer.

#### 1.04 QUALITY ASSURANCE

- A. Materials and supplies provided shall be the standard products of manufacturers. The standard products of manufacturers other than those specified may be accepted if it is demonstrated that they are equal in composition, durability, and usefulness for the purpose intended. All material components of an installed lining system shall be supplied by a single manufacturer.
- B. The Engineer will inspect the rehabilitated manholes to evaluate the Contractor's work.

#### 1.05 RELATED SECTIONS

- A. The Work of the following Sections apply to the Work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of the Work.
  - 1. Section 02511: Preconditioning and Cleaning Manholes and Sewers
  - 2. Section 02750: Wastewater Flow Control
  - 3. Section 02200: Earthwork
  - 4. Section 02140: Dewatering

## **1.06 TRIAL TEST AND METHODOLOGY REVIEW**

- A. The Contractor shall comply with the following conditions before a manhole rehabilitation technique becomes accepted as a viable option on a repeat basis:
  - 1. A successful demonstration of manhole rehabilitation, for a manhole chosen by the Engineer, shall be carried out including type and quality control tests as recommended by the manufacturer and in compliance with industry standards.
  - 2. The trial shall be performed prior to approval for adoption by the Engineer of the manhole rehabilitation technique to prove that the equipment, materials and installation methodology are fully acceptable to meet local conditions. Payment will be made through the applicable unit price for the work.
  - 3. The Contractor shall allow for any further requirement of the Engineer, subsequent to the trial, to modify the equipment, material and/or installation methodology in order to complete the work satisfactorily and meet all testing standards, including vacuum testing of Rehabilitated Manholes, at no cost to the City.
- B. A representative from the manufacturer of the manhole rehabilitation system shall be present on-site for the entire duration of the trial test and methodology review. The manufacturer's representative shall certify in writing that the system applicator and/or installer has performed the application and/or installation in accordance with the manufacturer's requirements and recommendations.

## **PART 2 – PRODUCTS**

### **2.01 GENERAL**

- A. The installer shall warrant and hold harmless the City and the Engineer against all claims for patent infringement and any loss thereof.
- B. The materials used shall be designed, manufactured and specifically intended for sewer manhole rehabilitation and the specific application in which they are used. The materials shall have a proven history of performance in sewer manhole rehabilitation for a minimum of three (3) years in sewer systems elsewhere nationally, of similar age, groundwater levels and circumstance.

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- C. The materials shall be delivered to the job site in original unopened packages and clearly labeled with the manufacturer's identification (brand name), date of manufacture, storage life and printed instructions.
- D. Stored materials shall be protected from weather and excessive heat or cold, and stored in accordance with the manufacturer's instructions. Flammable materials shall be stored in accordance with state and local codes. Materials exceeding storage life recommended by the manufacturer shall be removed from the site.
- E. The Contractor shall dispose of all wastes in accordance with applicable regulations.
- F. At the request of the Engineer, the Contractor shall provide a representative employed by the manufacturer having technical training in any of the specific manhole rehabilitation materials and/or system or technique being applied. The appropriate specialist shall be available for consultation on site within 48 hours notice, at no cost to the City.
- G. All completed rehabilitation work shall be resistant to:
  - 1. Continuous immersion in septic sewage at temperatures up to 85°F
  - 2. Continuous exposure to hydrogen sulfide gas from septic sewage at temperatures up to 85°F
  - 3. Deposits of free sulfur on exposed surfaces
  - 4. Continuous exposure to 10% sulfuric acid at temperatures up to 85°F

Seals shall be tested to withstand all subsequent infiltration, inflow, and exfiltration as specified herein.

## **PART 2A – MANHOLE INTERIOR RENEWAL**

### **2A.01 MANHOLE SEALING TO EXCLUDE INFILTRATION**

- A. General:
  - 1. Manholes will be sealed when active leaks are present, and/or will be patched when there is exposed aggregate (concrete manholes) or brick mortar missing (brick manholes) in small isolated areas.
  - 2. The generic chemical sealing materials to be used are listed with the basic properties, performance standards, and mix ratios that are

known to give acceptable performance.

3. In every case, mixing and handling of chemical sealing material shall be in accordance with the manufacturer's recommendations.

B. Characteristics of Sealing Chemicals:

1. All chemical sealing materials used in the performance of the work specified must have the following characteristics:
  - a. The chemical sealant must be able to react/perform in the presence of water (groundwater) while being injected, i.e., the sealant must be hydrophilic.
  - b. The cured material must withstand submergence in water without degradation.
  - c. The resultant sealant (grout) formation must prevent, on a continuing basis, the passage of water (infiltration) through manhole and sewer pipe joints.
  - d. The sealant material, after curing, must be flexible as opposed to brittle.
  - e. The sealant formation should be able to withstand freeze/thaw and wet/dry cycles without adversely affecting sealant properties. Note: This primarily applies to storm sewers, which are shallow and sometimes dry.
  - f. The sealant formation must not be biodegradable.
  - g. The cured sealant should be chemically stable and resistant to the mild concentrations of acids, alkalis, and organics found in normal sewage.
  - h. Packaging of component materials must be compatible with field storage and handling requirements. Packaging must provide for worker safety and minimize spillage during handling.
  - i. Mixing of the component materials must be compatible with field operations and not require precise measurements of the ingredients by field personnel.
  - j. Clean up must be done without inordinate use of flammable or hazardous chemicals.

- k. Residual sealing materials must be easily removable from the sewer line to prevent reduction or blockage of the sewage flow.

C. Acceptable Chemical Sealing Materials:

- 1. The following is a generic listing of permissible chemical sealing materials currently in use and the basic requirements, properties and characteristics of each.

- a. Acrylamide base gel sealing material:

- 1) A minimum of 10% acrylamide base material by weight in the total sealant mix. A higher concentration (%) of acrylamide base material may be used to increase strength or offset dilution during injection.
- 2) The ability to tolerate some dilution and react in moving water during injection
- 3) A viscosity of approximately 2 centipoise which can be increased with additives
- 4) A constant viscosity during the reaction period
- 5) A controllable reaction time from 10 seconds to 1 hour
- 6) A reaction (curing) which produces a homogeneous, chemically stable, non-biodegradable, firm, flexible gel
- 7) The ability to increase mix viscosity, density and gel strength by the use of additives

- b. Acrylic base gel chemical sealing material:

- 1) minimum of 10% acrylic base material by volume in the total sealant mix. A higher concentration (%) of acrylic base material may be used to increase strength or offset dilution during injection.
- 2) The ability to tolerate some dilution and react in moving water during injection

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- 3) A viscosity of approximately 2 centipoise, which can be increased with additives
- 4) A constant viscosity during the reaction period
- 5) A controllable reaction time from 5 seconds to 6 hours
- 6) A reaction (curing) which produces a homogeneous, chemically stable, non-biodegradable, flexible gel
- 7) The ability to increase mix viscosity, density and gel strength by the use of additives

c. Urethane base gel chemical sealing material:

- 1) One (1) part urethane prepolymer thoroughly mixed with between 5 and 11 parts of water by weight. The recommended mix ratio is 1 part urethane prepolymer to 8 parts of water (11% prepolymer).
- 2) A liquid prepolymer having a solids content of 77% to 83%, specific gravity of 1.04 (8.65 pounds per gallon), and a flash point of 20°F
- 3) A liquid prepolymer having a viscosity of 300 to 1000 centipoise at 70°F that can be pumped through 500 feet of 1/2-inch hose with a 1000 psi head at a flow rate of 1 ounce per second
- 4) The water used to react the prepolymer should have a pH of 5 to 9.
- 5) Gel times shall be as short as practical and as short as two (2) minutes for polyurethane grouts, in accordance with the manufacturer's recommendations. Control of gel times is a critical aspect of successful chemical grouting. Higher water ratios give longer cure times.
- 6) A relatively rapid viscosity increase of the prepolymer/water mix in the first minute. (Viscosity increases from about 10 to 60 centipoise in the first minute for 1 to 8 prepolymer/water ratio at 50°F).
- 7) A reaction (curing) which produces a chemically stable and non-biodegradable, tough, flexible gel.

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- 8) The ability to increase mix viscosity, density, gel strength and resistance to shrinkage by the use of additives to the water

d. Urethane base foam chemical sealing material:

- 1) Approximately one part of urethane prepolymer with one part of water by weight (50% prepolymer)
- 2) A liquid prepolymer having a solids content of 82 specific gravity of 1.1 (9.15 pounds per gallon) flash point of 200°F
- 3) A liquid prepolymer having a viscosity of 30 centipoise at 72°F that can be pumped through 50 feet of 1/2-inch hose with a 500 psi head at a flow rate of one ounce per second
- 4) A cure time of 15 minutes at 40°F, 8.2 minutes at 60°F 4.6 minutes at 100°F when the prepolymer is reacting with water only
- 5) A cure time of 5.5 minutes at 40°F, 8.2 minutes at 60°F, 2.6 minutes at 100°F when the prepolymer is reacting with water containing 0.4% accelerator
- 6) During injection; foaming, expansion, and viscosity increase occur.
- 7) Physical properties of the cured foam of approximately 14 pounds per cubic foot density, 80 to 90 psi strength, and 700% to 800% elongation when a mixture of prepolymer and 50% water undergoes a confined test and expands five times its initial liquid volume.
- 8) Acrylamide and acrylic gel grouts maintain a viscosity close to that of water (2 centipoise) during the time between mixing material solution with the activator solution and the formation of a gel. This time period is referred to as the cure time, induction period, or gel time. The low viscosity is advantageous for penetration but makes the grouts susceptible to dilution during the reaction period.
- 9) Urethane gel grout undergoes a viscosity increase during the time between mixing the base material with

water and the formation of a gel. This time period is cure time or gel time. The increasing viscosity limits penetration by dilution, particularly by groundwater.

## **2A.02 PATCHING**

- A. Manhole patching work includes re-pointing, filling, and repairing non-leaking holes, cracks, and spalls in concrete and masonry manhole walls, benches and slabs as well as through-flow channel dressing and repair.
- B. The patching material shall consist of a premixed non-shrink cement-based patching material consisting of hydraulic cement, graded silica aggregates, special plasticizing and accelerating agents, which has been formulated for vertical or overhead use. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder, or gas forming agents or promote the corrosion of steel it may come into contact with. Set time (ASTM C-191) shall be less than 30 minutes. One hour compressive strength (ASTM C-109) shall be a minimum of 200 psi and the ultimate compressive strengths (ASTM C-882 Modified) shall be a minimum of 1700 psi.

## **PART 2B – MANHOLE LINING SYSTEMS**

### **2B.01 EPOXY BASED LINING SYSTEM**

- A. Manholes will be lined with epoxy or epoxy mortar when the manholes are subject to high groundwater levels (manholes near lakes/creeks, etc.) resulting in significantly active infiltration (runners and gushers) and/or subject to corrosive environments.
- B. Epoxy lining systems shall be completely watertight and free of any joints or openings other than pipe inlets and the rim opening. The junction of the lining material with the pipe material at the inlets and outlets shall be completely watertight.
- C. Each lining application shall be designed for application over damp (but not wet or active running water) surfaces without degradation of the final product and the bond between the product and the manhole surfaces.
- D. Generally, the entire interior walls of manholes as designated to be rehabilitated shall be lined with epoxy or epoxy mortar liner, as follows:
  - 1. The epoxy or epoxy mortar liner shall be used to form a monolithic liner covering all interior surfaces of the manhole, including benches and inverts.



## Section 02491 – Rehabilitation of Sanitary Sewer Manholes

2. The finished epoxy based monolithic liner shall conform to the following minimum requirements at 28 days:

PROPERTY	TEST METHOD	RESULTS
Compressive Strength	ASTM C-579	≥ 6,500 psi
Tensile Strength	ASTM C-307	≥ 2,500 psi
Flexural Strength	ASTM C-580	≥ 4,500 psi
Shrinkage	ASTM C-531	< 0.15%
Bond Strength	ASTM D-4541	Concrete failure

3. The finished manhole shall be resistant to corrosive conditions common to municipal wastewater and shall prohibit water infiltration.
4. The epoxy based liner shall be suitable for application over damp or dry concrete surfaces.
- E. At a minimum, the manhole rehabilitation epoxy or epoxy mortar liner system (product coating designation) must have received a passing score without receiving an N/E result in any category as documented in the following study:

**“EVALUATION OF PROTECTIVE COATINGS FOR CONCRETE”**

August, 2002 Update

John A. Redner, Sewerage Departmental Engineer,  
 Randolph P. Hsi, Associate Engineer, Edward J. Esfandi,  
 Senior Engineer, Roger Sydney, Civil Engineer, Robin M.  
 Jones, Associate Engineer, and Donna Won, Senior  
 Engineer

County Sanitation Districts of Los Angeles County, Whittier,  
 California.

- F. Acceptable systems include, but are not limited to, the following:
1. Raven 405 (Raven Lining Systems)
  2. Mainstay DS-4 (Madewell Products)
  3. Magma Quartz or Belzona 4111 (Belzona Inc.)
  4. Sauereisen-210 (Sauereisen)
  5. Warren Epoxy Spray or Laminate (Warren Environmental)

## 2B.02 FIBERGLASS LINING SYSTEM

- A. Manholes will be lined with a cured-in-place fiberglass insert when the manhole interior is structurally deteriorated (concrete or brick manholes), and/or subject to a corrosive environment.
- B. The fiberglass lining system shall consist of a three layer composite, laminate system comprised of one non-permeable synthetic, environmental membrane embedded and bonded between two layers of structural fiberglass woven fabric impregnated with a modified epoxy resin system. The average wall thickness of the fiberglass liner system shall be no less than 0.5-inch unless otherwise allowed, but shall be structurally designed to withstand all structural loads.
- C. The finished fiberglass liner shall conform to the following minimum physical properties:

PROPERTY	TEST METHOD	RESULTS
Max. Flexural Fiber Stress	ASTM D-790	≥ 44,000 psi
Flexural Modulus of Elasticity	ASTM D-790	≥ 1,000,000 psi
Compressive Strength	ASTM D-695	≥ 11,000 psi
Compressive Modulus	ASTM D-695	≥ 900,000 psi
Strength at Break	ASTM D-638	≥ 28,000 psi
% Elongation at Break	ASTM D-638	< 9%
% Elongation at Max. Load	ASTM D-638	< 2%

- D. Acceptable products are equal to Poly-Triplex PTL5-6800 series manufactured by Poly Triplex Technologies, Inc.

### 2B.03 CEMENTITIOUS LINING SYSTEM

- A. Manholes will be lined with cementitious lining for preventive maintenance when the manhole interior is mildly weathered or aged, and/or subject to minor infiltration (seepers or drippers).
- B. Cementitious lining systems shall be completely watertight and free of any joints or openings other than pipe inlets and the rim opening. The junction of the lining material with the pipe material at the inlets and outlets shall be completely watertight.
- C. Each lining application shall be designed for application over damp (but not wet or active running water) surfaces without degradation of the final product and the bond between the product and the manhole surfaces.
- D. Generally, the entire interior walls of manholes as designated shall be lined with calcium aluminate cementitious liner, as follows:

## Section 02491 – Rehabilitation of Sanitary Sewer Manholes

1. The calcium aluminate cementitious liner shall be used to form a monolithic liner covering all interior surfaces of the manhole, including benches and inverts.
2. The finished cementitious liner shall conform to the following minimum requirements at 28 days:

PROPERTY	TEST METHOD	RESULTS
Compressive Strength	ASTM C-109	≥ 8,000 psi
Tensile Strength	ASTM C-496	≥ 800 psi
Flexural Strength	ASTM C-293	≥ 1,500 psi
Shrinkage (@ 90% R.H.)	ASTM C-490	0%
Bond Strength	ASTM C-882	≥ 2000 psi

3. The finished manhole shall be resistant to corrosive conditions common to municipal wastewater and shall prohibit water infiltration.
- E. The cementitious liner mix shall be factory blended requiring only the addition of water at the jobsite. The liner mix shall be suitable for “wet” application by progressive cavity pump type equipment only. Gunite mixes will not be allowed.
- F. The liner applicator must use approved equipment designed and/or approved by the material manufacturer specifically for the application of cementitious liners in manholes. Only low-pressure, progressive cavity pump type equipment for “wet” application will be allowed.
- G. Acceptable systems are those equal to:
1. Strong-Seal® by The Strong Company, Inc.;
  2. Sewpercoat® by Lafarge Calcium Aluminates, Inc.;

**PART 2C - MANHOLE RAISING/ADJUSTMENT TO GRADE****2C.01 GENERAL****A. Brick**

1. Brick shall conform to ASTM C-32 for grade SM. Bricks shall conform to the following dimensions, unless otherwise approved by the Engineer:

	Depth	Width	Length
	(inches)	(inches)	(inches)

## Section 02491 – Rehabilitation of Sanitary Sewer Manholes

Standard Size	2 ¼	3 ¾	8
Allowable Variation	± ¼	± ¼	± ½

2. All brick shall be new and whole, or uniform standard size and with substantially straight and parallel edges and square corners. Bricks shall be of compact textures, burned hard entirely through, tough and strong, free from injurious cracks and flaws, and shall have a clear ring when struck together. No soft or salmon brick shall be used except at such places, to such extent, and under such conditions as may be approved by the Engineer.

## B. Mortar

1. The Contractor shall use mortar meeting the requirements of ASTM C-270 Type S unless directed otherwise by the Engineer.
2. The Contractor shall prepare mortar only in quantities needed for immediate use. Mortar which has been mixed for more than 30 minutes, which has set, or which has been retempered shall not be used.
3. No mortars utilizing latex emulsifiers or plasticizers as a filler are acceptable. No bonding agents are allowed.

## C. Cast Iron Adjustment Rings

1. For adjusting lid elevation: Adjusting rings shall be cast iron equal to Series R-1979-H (heavy duty) manufactured by Neenah Foundry.
2. All adjusting rings shall be securely sealed to the casting frame using resilient, flexible, non-hardening, preformed butyl mastic equal to Rub R Nek or EZ Stick. This mastic shall be applied in such a manner that no surface water or ground water inflow can enter the manhole through gaps between the first adjusting ring, between adjusting rings, or between the last adjusting ring and the manhole frame. Up to two (2) inches of adjusting rings may be installed on a given manhole. No more than two (2) adjusting rings in total shall be used for the final adjustment to grade.

## D. Concrete Grade Rings

1. For manhole adjustment to grade: Pre-cast concrete grade rings may be used instead of brick and mortar for adjusting pre-cast concrete manholes to grade. The pre-cast concrete rings shall be installed between the top of the cone and the casting frame. Grade

## Section 02491 – Rehabilitation of Sanitary Sewer Manholes

rings shall be pre-cast concrete, as manufactured by Standard Concrete Products (lightweight) or approved equal.

2. All grade rings shall be securely sealed to the bottom of the casting frame and the top of the cone using a resilient, flexible, non-hardening, preformed butyl mastic equal to Rub R Nek or EZ Stick. No less than two beads shall be applied 1/2 inch wide and 3/4 inch high between grade rings when grade rings are stacked. No less than one inch of non-shrink cement based patching material shall be applied to the inside and outside faces of the grade rings when grade rings are stacked.

## 2C.02 MANHOLE CASTING EMBEDMENT SEALANT TO EXCLUDE RDI/I

- A Provide a premium, extruded bituminous tacky rubber sealant in rope form for use on manholes as an embedment material for the frame to adjusting brick/mortar corbel.
- B. Sealant shall conform to AASHTO M-198 Type B and SS-S-210 and SS-S-210A.

### C. Properties:

1. Chemical Composition:

Hydrocarbon Plastic Content % by wt	SPEC REQUIRED
Inert Mineral Filler % by wt	ASTM D4 (mod.) 50-70
Volatile Matter % by wt	SS-S-210A 30-50
	ASTM D6 3.0 max
2. Physical Properties:

Specific Gravity, 77°F	ASTM D71 1.20-1.35
Ductility, 77°F	ASTM D 113 5.0 min
Softening Point	ASTM D36 320 min
Flash Point, C. 0. C. min	ASTM D92 600 min
Fire Point, C. 0. C. min.	ASTM D92 625 min
Penetration, 77°F (150 gm) 5 sec.	ASTM D217 50 to 120
3. Chemical Resistance:

<u>30-Day Immersion:</u> No visible deterioration when tested for 30 days in 5% caustic potash, 5% hydrochloric acid, 5% sulfuric acid, or 5% saturated hydrogen sulfide	
Elongation Initial, 77°F	300% min
Two Weeks, Total Water Immersion	300% min
Flow Resistance (one inch wide overhead joint exposed to 135°F for 7 days)	No Flow
Storage Life	Indefinite
Application Temperature Range	10 to 125°F
Service Temperature Range	-20 to 200°F

## PART 2D – REPLACEMENT MANHOLE FRAMES AND COVERS

### 2D.01 GENERAL

- A. New manhole covers and frames shall conform to the requirements of the City's standard and standard details.
- B. Frames and covers shall be Neenah Foundry, Series R-1700 (heavy duty) or equivalent. Light duty covers shall not be used.
- C. Where manholes are located in flood plains, frames and covers shall be Neenah Foundry, Series R-1700 (heavy duty) or equivalent. Light duty covers shall not be used. The top surface of the frame and covers shall have bolt down lids with a watertight gasket.

### 2D.02 ELASTOMERIC CORBEL SEAL TO EXCLUDE RDI/I

- A. Provide a frame-to-manhole elastomeric seal consisting of a two component, aliphatic chemical curing, urethane sealant formulated as a high build coating to seal the casting to the manhole corbel. The purpose is to stop infiltration by the application of a corrosion resistant flexible coating to be applied to the inside wall. The corrosion resistant flexible urethane shall be Flex-Seal Utility Sealant as manufactured by Sealing Systems, Inc., Loretto, or approved equal.

- B. Minimum Requirements for Flexible Aromatic Urethane Resin Liner Primer:

Hardness	ASTM-D2240	85 Brinell
Elongation	ASTM-D412	400%
Tensile Strength	ASTM-D412	3000 p.s.i.
Adhesive Strength	ASTM-D0903	3 50 lb./in.
Tear Resistance	ASTM-D1004	200 lb./in.

- C. Minimum Requirements for Flexible Aromatic Urethane Resin Liner Final Coat:

Hardness	ASTM-D2240	50 Brinell
Elongation	ASTM-D412	750 %
Tensile Strength	ASTM-D412	1100 p.s.i.
Adhesive Strength	ASTM-D0903	175 lb./in.
Tear Resistance	ASTM-D1004	155 lb./in.

- D. Minimum Final Thickness: 80 mils.

## **PART 2E – REPLACEMENT MANHOLES**

### **2E.01 GENERAL**

- A. New manholes shall conform to the requirements of Section 02730 and the City's standard details.

## **PART 3 – EXECUTION**

### **3.01 PERFORMANCE REQUIREMENTS**

- A. Perform work needed to make manholes structurally sound, improve flow, prevent entrance of inflow or groundwater infiltration, and prevent entrance of soil or debris.
- B. Existing manhole shall be Preconditioned and Cleaned in accordance with Specification Section 02511 prior to any and all rehabilitation work.

### **3.02 PROJECT CONDITIONS**

- A. Manholes Containing Flow Monitoring Equipment:
  - 1. Drawings may not show locations of flow monitoring equipment. If a manhole contains any mechanical hardware or electrical flow monitoring equipment, immediately notify the Engineer.
  - 2. Reschedule work in such manholes until equipment has been removed by the City and further instructions are given, at no additional cost.
  - 3. Do not subject manholes with mechanical hardware or electrical equipment to bypass or diversion pumping.
  - 4. Damage to installed equipment, due to Contractor's failure to adhere to the above, will be repaired by the City and cost of repairs charged to Contractor.
- B. Field Location of Manholes:
  - 1. Manholes may be located within project limits, which are not part of the system being rehabilitated. Properly identify manholes before starting work. No payment will be made for work in manholes not indicated on the Drawings or not directed in writing by the Engineer

**3.03 SALVAGE**

- A. Manhole covers and frames, as well as adjusting rings from abandoned, broken or adjusted manhole castings remain the property of the City. Deliver salvaged items to City's storage facility or as otherwise directed by the City at the conclusion of the project.

**3.04 PROTECTION**

- A. Provide barricades and warning lights and signs for excavations created by manhole casting work in accordance with the drawings.
- B. Do not allow sand, debris or runoff to enter sewer system.

**3.05 EXCAVATION**

- A. Excavate in accordance with City's Standard Specifications and Section 02200.
- B. Perform work in accordance with OSHA standards. Employ a trench safety system, as required for excavations.
- C. Install and operate necessary dewatering and surface water control measures as required.

**3.06 FLOW BYPASS AND DIVERSION PUMPING**

- A. Install and operate bypass and diversion pumping equipment to maintain sewage flow and to prevent backup or overflow in accordance with Specification Section 02750 – Wastewater Flow Controls.

**3.07 LINERS**

- A. General. The entire interior walls of manholes as designated on the drawings or instructed by the Engineer to be rehabilitated shall be lined with epoxy/epoxy mortar lining, cementitious lining or fiberglass lining system.
- B. All liners shall be installed in accordance with the manufacturer's written instructions.

**3.08 EPOXY LINER**

- A. Storage, mixing, application and curing procedures shall conform to the recommendations of the monolithic epoxy or epoxy mortar liner manufacturer. The epoxy or epoxy mortar may be spray, trowel or brush



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applied onto the interior surfaces of the manhole as recommended by the manufacturer.

- B. Surfaces shall be made free of oil, grease, water and other contaminants prior to application of the epoxy or epoxy mortar liner. An abrasive blast, high-pressure water blast, or acid etching shall be used to obtain a uniform sound substrate with a neutral pH prior to the application of the epoxy liner.
- C. After cleaning and prior to liner installation, all large voids and spalled areas shall be filled and patched with a suitable patching. The patching compound shall conform to the recommendations of the epoxy or epoxy mortar liner manufacturer.
- D. The epoxy or epoxy mortar lining system shall be installed to the manufacturer's recommended thickness and number of coat applications. No sagging of the liner on vertical surfaces shall be acceptable to the Engineer.
- E. The epoxy or epoxy mortar liner shall not be installed on surfaces in direct sunlight or when surfaces are subject to rising temperatures to prevent blistering of materials due to thermal expansion of trapped air or moisture in the substrate.

### **3.09 FIBERGLASS LINING SYSTEM**

- A. After cleaning and prior to liner installation, all large voids and spalled areas shall be filled and patched with a suitable patching compound. The patching compound shall be as recommended by the lining system manufacturer.
- B. The installation of the lining system shall be in strict accordance with the manufacturer's written installation procedures.
- C. After the liner system is installed it shall be cut and trimmed. The completed product shall be a permanent, monolithic, lined and impervious structure shaped to the interior of the existing manhole. The manhole shaft lining systems shall be completely water tight and free of any joints or openings other than pipe inlets, pipe outlets and the rim opening.
- D. All defective areas and imperfections including, but not limited to, poor adhesion, excessive void, and air bubbles shall be repaired in strict conformance with the recommendation of the lining system manufacturer and subject to the approval of the Engineer.

### 3.10 CEMENTITIOUS LINER

- A. Storage, mixing, application and curing procedures shall conform to the recommendations of the cementitious liner manufacturer. The cementitious liner shall be spray applied using a low-pressure, progressive cavity type pump onto the interior surfaces of the manhole as recommended by the manufacturer. Gunite or “dry” applications will not be allowed.
- B. Surfaces shall be made free of oil, grease, water and other contaminants prior to application of the cementitious liner. An abrasive blast, high-pressure water blast, or acid etching shall be used to obtain a uniform sound substrate with a neutral pH prior to the application of the cementitious liner.
- C. After cleaning and prior to liner application, loose and protruding brick, mortar, or concrete shall be removed and all large voids and spalled areas shall be filled and patched with a suitable patching compound. The patching compound shall conform to the recommendations of the cementitious liner manufacturer.
- D. The cementitious lining system shall be installed to the manufacturer’s recommended thickness and number of coat applications up to one-inch (1”) thickness, but not less than one-half-inch (1/2”) thickness. The finished surface shall then be trowel-finished and/or brush-finished to a relatively smooth finish.
- E. The freshly applied liner shall be protected from high-velocity surface drying or air movement.

### 3.11 MANHOLE BENCHES/THROUGH-FLOW CHANNELS

- A. Formation of Through-Flow Channel:
  - 1. Remove obstructions and loose materials from benches prior to shaping the through flow channel. Form a smooth, U-shaped channel having a minimum depth of one pipe diameter and channel it across the floor of the manhole using an approved manhole rehabilitation material as specified in Part 2. Control flow to allow sufficient setting time for material used.
  - 2. Form a smooth transition with a reshaped channel and a raised manhole bench to eliminate sharp edges of pipe and concrete bench. Build up and smooth through flow channel of manhole to match flow line of pipe.

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3. Make finished benches and through flow channels smooth and without defects which would allow for accumulation of debris.

**B. Remedial Work to Existing Manhole:**

1. Exposed reinforcement shall be sand blasted, epoxy primed and protected by a premixed non-shrink cement-based patching material consisting of hydraulic cement, graded silica aggregates, special plasticizing and accelerating agents, which has been formulated for vertical or overhead use. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder, or gas forming agents or promote the corrosion of steel it may come into contact with.

**C. Connection of Pipelines to Replacement Manholes:**

1. In connecting pipelines to replacement manholes, the Contractor shall ensure that the connections are watertight and that the existing sewers and replacement manholes are not damaged.
2. The Contractor shall ensure that there is no interruption to existing flows during the connection works.
3. The Contractor shall adjust replacement manhole benchings and bases to accommodate existing pipelines to ensure a continuous invert without steps.
4. All connections into manholes shall be designed and installed so as to ensure that groundwater is not permitted to enter the confines of the sewer or manhole. The Contractor shall submit proposals together with any material specification for making fully sealed connections into replacement manholes to the Engineer for approval.

### **3.12 REPLACEMENT MANHOLE FRAMES AND COVERS**

- A. Adjust all manhole frames and covers above or at grade, reset loose frames, and install elastomeric corbel seal.
- B. Where manholes are constructed in paved areas, the frame and cover shall be combined with brick work or cast iron adjustment rings so that the elevation of the top surface of the installed casting cover is flush with the surrounding pavement constructed to the exact slope, crown and grade of the existing adjacent pavement. Manholes in locally low-lying areas, where surface water may collect, may incorporate self-sealing covers or manhole inserts as directed by the Engineer. Inside surface of all manhole cover frames shall incorporate the unique 3-digit manhole number corresponding to the City's GIS identification number. The number shall be stenciled with

## Section 02491 – Rehabilitation of Sanitary Sewer Manholes

1.5-inch high epoxy painted figures on surface prepared to manufacturer's requirements. For example, if the 11-digit manhole number is 23250111401, the number 114 will be stenciled on the inside surface of the frame.

- C. Where manholes are constructed in paved areas in flood plains, the frame and covers shall have bolt down lids with a watertight gasket. The frame and cover shall be combined with brick work or cast iron adjustment rings so that the top surface of the installed casting cover is flush with the surrounding pavement constructed to the exact slope, crown and grade of the existing adjacent pavement. Inside surface of all manhole cover frames shall incorporate the unique 3-digit manhole number corresponding to the City's GIS identification number. The number shall be stenciled with 1.5-inch high epoxy painted figures on surface prepared to manufacturers requirements or as directed by the Engineer.
- D. Where manholes are constructed in non-pavement areas in flood plains or otherwise, the top surface of the frame and covers shall have bolt down lids with a watertight gasket, as directed by the Engineer. Manhole frame and covers in the wooded or un-maintained areas shall be 30-inches above grade when combined with brick work or cast iron adjustment rings. Manholes in grassed areas maintained as lawns etc., shall be adjusted to be flush with the ground unless otherwise directed. The inside surface of all manhole cover frames shall incorporate the unique 3-digit manhole number corresponding to the City's GIS identification number. The number be shall stenciled with 1.5-inch high epoxy painted figures on surface prepared to manufacturers requirements or as directed by the Engineer.

### 3.13 MANHOLE RAISING/ADJUSTMENT TO GRADE

- A. The Contractor shall utilize maps, surveys, sounding instruments, or information from local residents to determine approximate location of buried manholes. Manholes shall be exposed utilizing hand techniques or by carefully probing with mechanical equipment. Manhole exposure in paved areas shall be accomplished by making a square cut in the surface with sufficient width to allow for the excavation of the material around the manhole to expose it to a depth necessary to facilitate adjustments.
- B. Manhole adjustment to grade is defined as raising the manhole cover (lid) elevation to grade by removing the casting frame, building up the manhole chimney to a maximum of 12 inches, then re-installing the frame and cover. The chimney may be built-up using brick and mortar or pre-cast concrete grade rings conforming to the requirements of this Section. Brick and mortar shall be used for manholes constructed of brick. Concrete grade rings shall be used for manholes constructed of concrete. A maximum adjustment of 12 inches will be allowed using brick and mortar or concrete grade rings between the bottom of the casting frame and the

## Section 02491 – Rehabilitation of Sanitary Sewer Manholes

top of the cone section. [Note: The 12-inches maximum is a cumulative limit – any existing brick or concrete in place between the frame and cone shall be included in the measurement of the allowable 12-inches.] Non-shrink mortar shall be applied to create a smooth finish on the interior and exterior prior to backfill. Cast iron adjusting rings may be used for either brick or concrete manholes to raise the cover (lid) at the top of the frame, if necessary for final adjustment. Up to two (2) inches of cast iron adjusting rings may be installed on a given manhole. No more than two (2) adjusting rings in total shall be used.

- C. Manhole raising to grade is defined as raising the manhole cover (lid) to grade by removing the casting frame, chimney and cone section, then rebuilding the manhole (with new components) up to grade in accordance with the Contract Drawings. Should any part(s) of the manhole below the cone be deemed incompatible with the new manhole components, then the entire manhole shall be removed and replaced to grade.

### 3.14 ELASTOMERIC CORBEL SEAL TO EXCLUDE RDI/

- A. The surfaces on which the elastomeric seal is to be installed shall be circular, clean, reasonably smooth and free of any loose material and excessive voids. If the surface is rough or irregular and would not provide an effective seal, it shall be smoothed with an approved microsilica enhanced grout. Any flaw or flaws in the manhole frame such as cracks, pits or protrusions, shall be repaired by filling with concrete or grinding smooth. This type of surface work will need to be done on manholes that have not been lined. Manholes that have been lined should not need any surface work in order to install the seal.
- B. Installation of seal shall be as directed by the manufacturer's installation instructions. A manufacturer's representative will train the Contractor in the proper method of installing the seal and will assist the Contractor with any problems they might encounter installing the seals.
- C. Frame to manhole seals shall be installed in such a manner that will prevent water migration between the manhole frame and manhole structure.
- D. The lower 3 inches on the casting frame and top 3 inches of the corbel must be prepared according to the manufacturer's instructions. The corbel/casting interface area shall receive a thickened flexible urethane to achieve a thickness of 80 mils to 120 mils. The seal shall be applied by spray, brush, or trowel 3 inches above the bottom of the frame, and shall cover the entire area to 3 inches below the lowest of bottom of the frame or lowest adjusting ring.

**3.15 INSPECTION AND TESTING OF COMPLETED MANHOLE**

- A. After manhole sealing or manhole lining has been completed, the surface of the installed liner shall be cleaned and prepared to permit visual inspection. Visually inspect the manhole in the presence of the Engineer. Check for cleanliness and for elimination of active leaks.
- B. Assist Engineer in verifying installation of lining thickness and sounding. Test points on the manhole wall where directed by the Engineer. Repair verification points prior to final acceptance of payment. The finished surface shall be free of blisters, "runs" or "sags" or other indications of uneven lining thickness. No evidence of visible leaks shall be acceptable. All costs for verification and testing shall be included in the unit price for manhole rehabilitation.
- C. In addition, at the City's request, the Contractor may be required within one year to visually inspect the manholes that were sealed or lined. Any work that has become defective within the one-year period shall be redone by the Contractor at no additional expense to the City.
- D. Vacuum testing is required for all manholes lined. This test must meet all requirements of Section 02730. The Engineer must be present during the test. All costs for vacuum testing shall be included in the unit price for manhole rehabilitation.

**3.16 REPLACEMENT OF EXISTING MANHOLE**

- A. The Contractor shall replace manholes where shown on the Drawings, or as directed by the Engineer. The Contractor shall dispose of all materials from the removed manholes to a licensed landfill.

**3.17 VACUUM TESTING**

- A. Rehabilitated and/or replaced pipelines and manholes shall be vacuum tested and/or low air pressure tested to detect possible points of infiltration in accordance with Section 02730. All inlets to the system shall be effectively closed and any residual flow shall be deemed to be infiltration. The attached form shall be used to document the test results.
- B. The Contractor shall include the cost of the vacuum test in the unit prices for rehabilitation or replacement for the purposes of carrying out the vacuum/low-pressure air test and all the foregoing requirements of this paragraph.

## **PART 4 – WARRANTY**

### **4.01 MATERIAL WARRANTY**

- A. A written guarantee of 5 years submitted to the City for the specific project shall be provided by the Manufacturers of the manhole rehabilitation materials.

### **4.02 WORKMANSHIP WARRANTY**

- A. A written guarantee of 2 years minimum shall be provided by the Contractor against any shortcoming in Workmanship.

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# **ATTACHMENT A**

## **MANHOLE LEAKAGE TEST RESULTS**

### **VACUUM-AIR METHOD**

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## MANHOLE LEAKAGE TEST RESULTS

### VACUUM-AIR METHOD

Work Order Number: \_\_\_\_\_ Date: \_\_\_\_\_

Project Description: \_\_\_\_\_

Contractor: \_\_\_\_\_ \*Manhole Diameter: \_\_\_\_\_

Specific Location of Test: \_\_\_\_\_

Manhole Depth 'A' From Flowline to Top of Cone(feet): \_\_\_\_\_

Initial Vacuum Gauge Reading: \_\_\_\_\_ **Must Be 10-inch Hg**

Time Test Must Be Conducted: \_\_\_\_\_ **In Seconds**

MINIMUM TEST TIMES FOR VARIOUS MANHOLE DIAMETERS AND DEPTHS			
Depth 'A' (feet)	Minimum Test Times with a 4 ft. Diameter	Minimum Test Times with a 5 ft. Diameter	Minimum Test Times with a 6 ft. Diameter
8	20	28	33
10	25	33	41
12	30	39	49
14	35	48	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97
26	64	85	105
28	69	91	113
30	74	98	121

Final Vacuum Gauge Reading: \_\_\_\_\_ **Inches of Hg**

Is Final Vacuum Gauge Reading greater than or equal to 9" of Hg? **YES** or **NO**

Mark One:

If YES is marked above, the test has

**PASSED**

If NO is marked above, the test has

**FAILED**

Inspector's Signature: \_\_\_\_\_

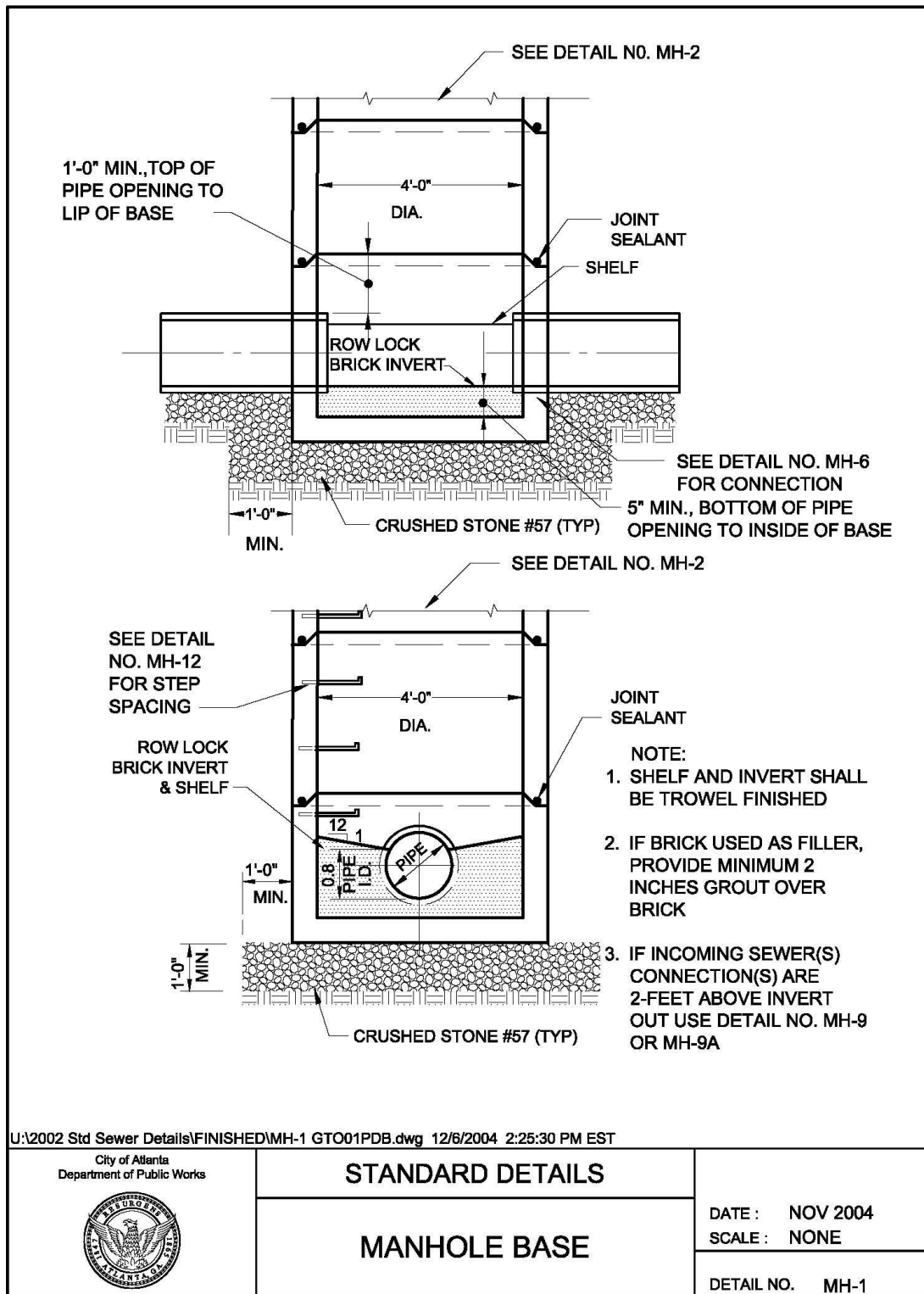
- A. Per Manufacturer of Vacuum Test Unit. For a 60-inch Manhole Over 30 ft. deep, add 6.5 seconds for each 2-feet over 24-feet. depth to a base time of 78 seconds. Therefore,  $(((\text{Depth} - 24)/2) \times 6.5) + 78 = \text{Test Time In Seconds}$ .

END OF SECTION

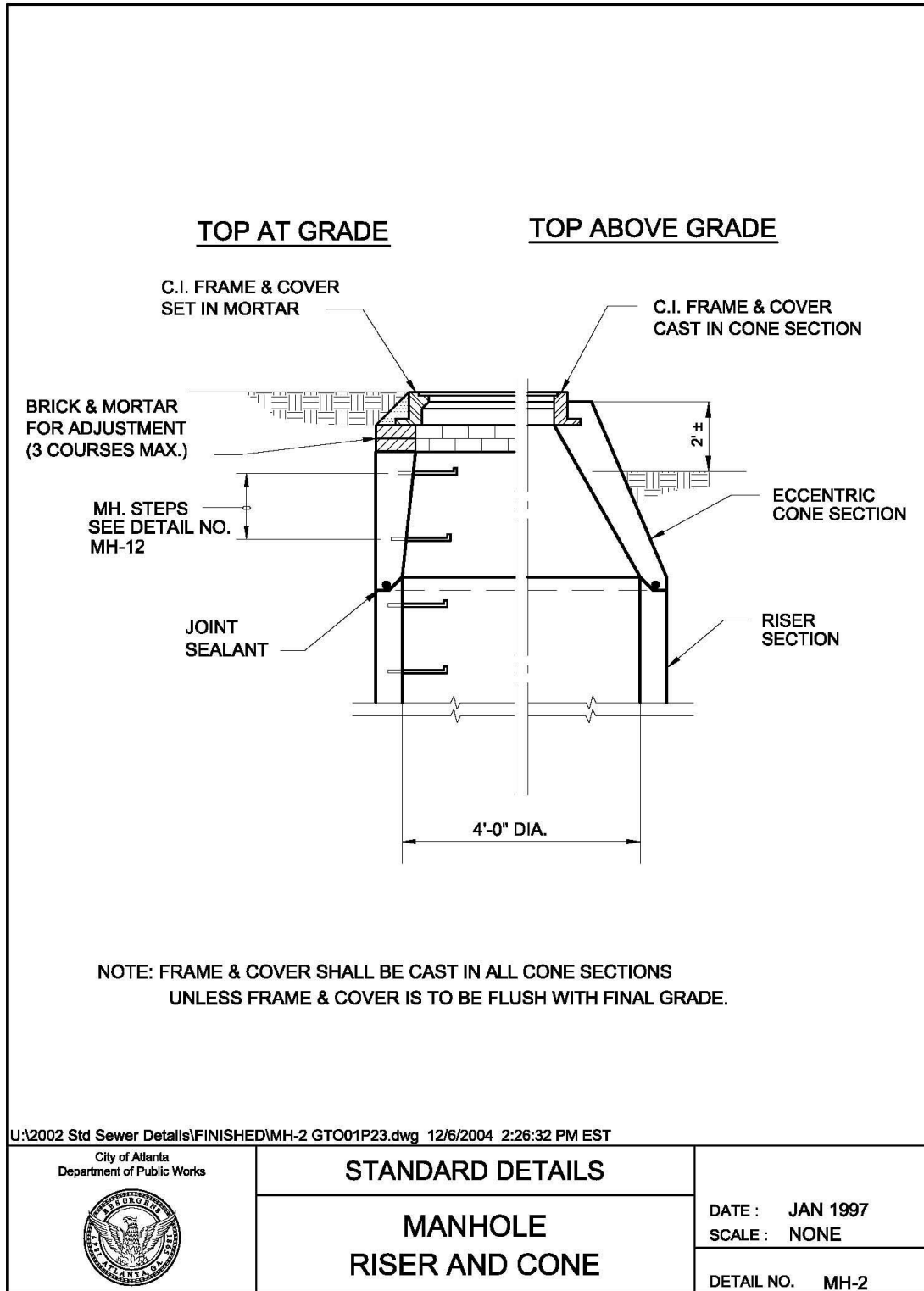
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# **ATTACHMENT B**

## **STANDARD DETAILS**



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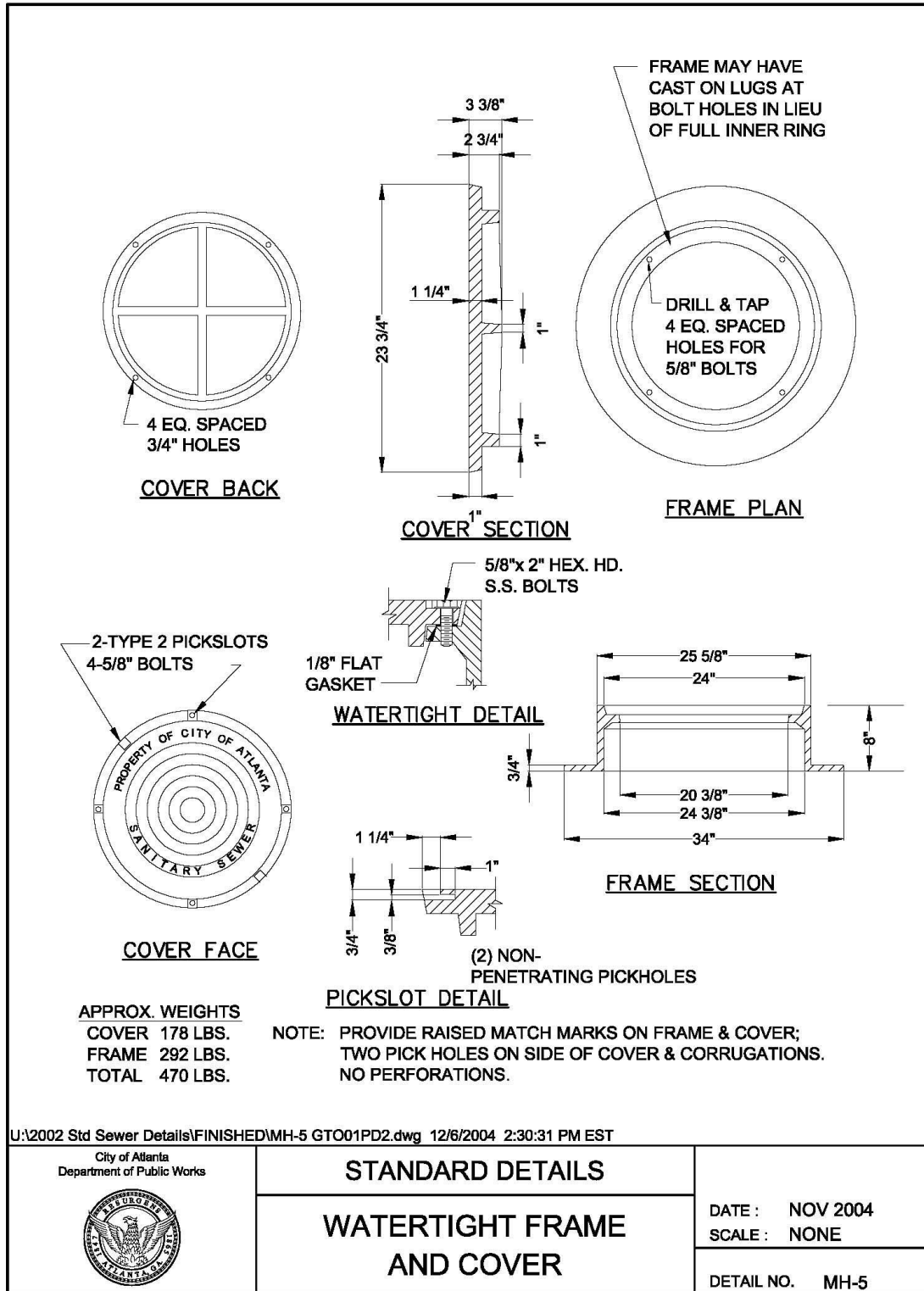


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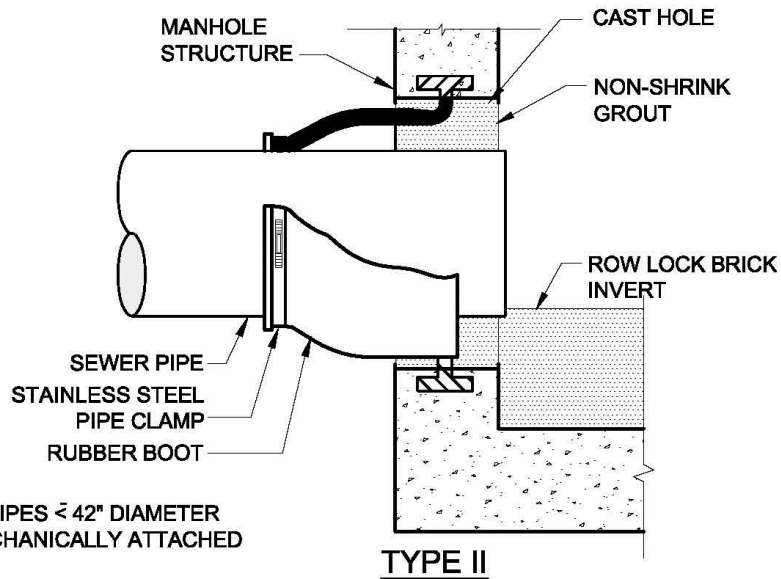
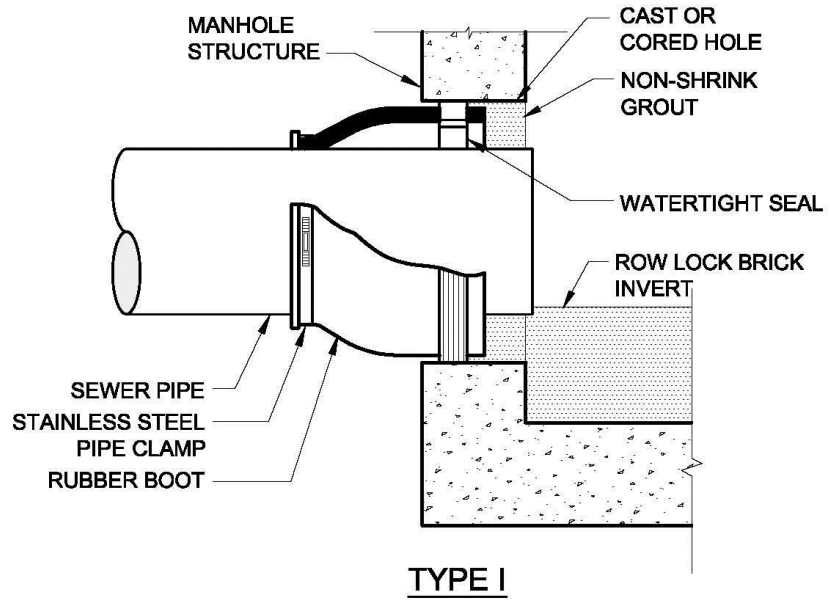








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**NOTE:**

1. USE BOOTS FOR PIPES  $\leq 42"$  DIAMETER
2. TYPE I IS FOR MECHANICALLY ATTACHED TYPE BOOTS.
3. TYPE II IS FOR CAST-IN BOOTS

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City of Atlanta  
Department of Public Works



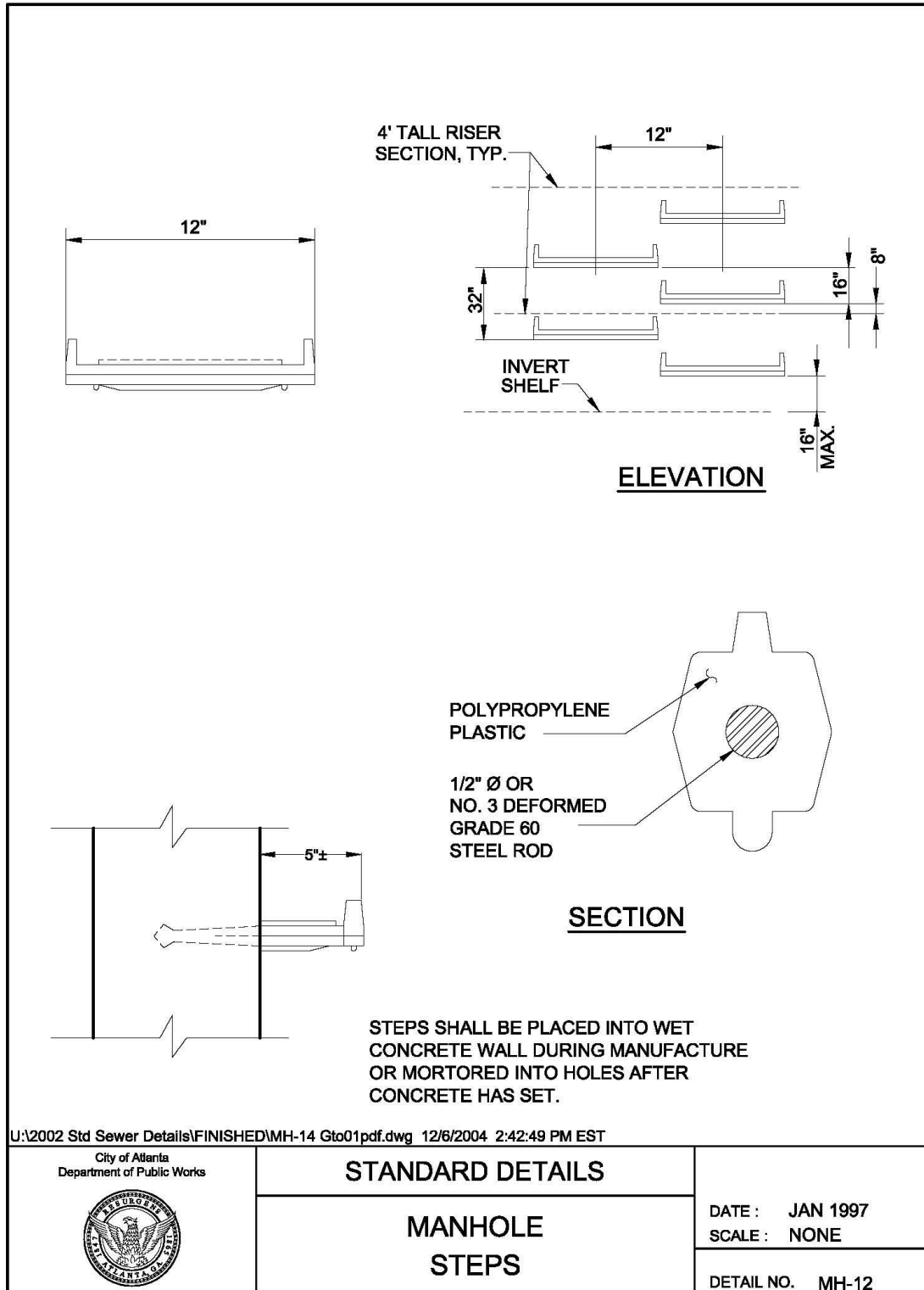
**STANDARD DETAILS**

**BOOT  
CONNECTION**

DATE : NOV 2004  
SCALE : NONE

DETAIL NO. MH-6

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END OF SECTION

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**SECTION 02511****Preconditioning and Cleaning Manholes and Sewers****PART 1 – GENERAL****1.01 SCOPE**

- A. The objective of preconditioning and cleaning is to maximize sewer and manhole service efficiency and effectiveness. Preconditioning and cleaning involves removal of silt, which is defined as any and all solid or semi-solid materials, including fine and granular material, such as sand, grit, gravel, and rock as well as debris, grease, oil, sludge, slime, or any other loose material or encrustation lodged in the manhole or sewer. Preconditioning and cleaning also involves removal of invading roots, corroded concrete, corroded manhole rungs, corroded ladders, intruding laterals and any other extraneous debris. Two levels of performance concerning preconditioning and cleaning of manholes and sewers shall be adhered to in this contract, as directed:
1. Preconditioning and cleaning as a general level of service; this requires that manholes and sewers shall be considered preconditioned and cleaned if:
    - a. Silt is removed and disposed of to a nominal depth of not more than 10% of the through flow channel in manholes, or sewer between manholes, where the through flow channel or sewer has an equivalent diameter up to and including 24-inches.
    - b. Silt is removed and disposed of to a nominal depth of not more than 5% of the through flow channel in manholes or sewer between manholes, where the through flow channel or sewer has an equivalent diameter greater than 24-inches.
    - c. No surface or appurtenance in manholes including walls, cones, slabs (both intermediate and roof slabs), rungs and benches and drop shafts shall have any remnant of silt, coating, loose bricks, unsound concrete or mortar or loose material.
    - d. All roots, corroded concrete, corroded rungs, corroded ladders and intruding laterals are treated or reduced and cut flush with the interior surface of manholes and sewers, removed and disposed of.

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Section 02511 – Preconditioning and Cleaning Manholes and Sewers

Fulfillment of these requirements (e.g., depth of silt or cleanliness of surface) is to be determined by internal manhole and sewer condition survey or inspection of each manhole and sewer length preconditioned or cleaned as directed.

2. Preconditioning and cleaning prior to rehabilitation and repair; which requires that manholes and sewers shall be considered preconditioned and cleaned if, in addition to the requirements of Section 1.01.A.1 above, all silt has been removed from a minimum of 95% of the through flow channel and sewer cross section. In the case of manholes, all surfaces shall be free of cleaning agents and their reactant products. Fulfillment of these requirements is to be established by internal manhole and sewer condition survey or inspection of each manhole and sewer length preconditioned or cleansed as directed.
- B. The Contractor shall precondition and clean the manholes and sewers selected by the Engineer or specified herein so as to remove all silt, debris, roots, corroded concrete, corroded rungs and ladders, intruding laterals, etc., and dispose of the material at an approved site.
  - C. During preconditioning and cleaning work and all other associated Contractor operations, sewer services shall be maintained at all times. This requirement may be relaxed only with the written approval of the Engineer.
  - D. The manholes and sewers to be preconditioned and cleaned convey sanitary sewage or combined sewage. In many instances such sewers are subject to high flows, either continuously or in a periodically varying cycle, due to rainfall, infiltration, and/or pumping operations. The Contractor shall include in his bid provisions for dealing with such variations, and where necessary, schedule his Work to accommodate such variation in flows.

## 1.02 RELATED SECTIONS

- A. The Work of the following Sections apply to the Work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of Work.
  1. Section 02752: Internal Sewer Condition Assessment.

## 1.03 REGULATORY REQUIREMENTS

- A. The Work of this Section shall comply with the current versions, with revisions, of the following: OSHA 29 CFR 1910.146 (permit-required confined-space regulations)

## Section 02511 – Preconditioning and Cleaning Manholes and Sewers

- B. All work and testing shall comply with the applicable Federal codes, including Federal Occupational Safety and Health Act of 1970 and the Construction Safety Act of 1969, as amended, and applicable state and local codes and standards; and to the extent applicable with the requirements of the Underwriter's Laboratories, Inc. and the National Electric Code.

#### **1.04 EXPERIENCED WORKERS**

- A. All crew chief(s) responsible for preconditioning and cleaning work shall have a minimum of 3 years previous experience in preconditioning, cleaning and related activities including:
  - 1. Use of gas safety monitors/detectors/testers
  - 2. Safe working in confined spaces
  - 3. Utilization of hydraulic pressure jetting/water blasting in sewers and confined spaces
  - 4. Utilization of root cutters and/or root treatment using chemicals
  - 5. Utilization of a wide range of cleaning nozzles in widely differing conditions
- B. The Contractor shall provide the Engineer with written documentation that all workers on site meet these experience requirements. This documentation shall include a list of projects on which each individual worked and client name and telephone number for each reference.

### **PART 2 – PRODUCTS – NOT USED**

### **PART 3 – EXECUTION OF THE WORK**

#### **3.01 GENERAL**

- A. Preconditioning and cleaning works shall be carried out from the downstream access manhole or chamber to the upstream access manhole or chamber and shall entirely comply with the performance requirements defined in the relevant sub-clause of clause 1.01 above.

#### **3.02 WORKING AREA**

- A. The working area in which machinery and equipment operates is to be kept to a minimum. Equipment not in use shall be removed from the work site so as to minimize disruption to traffic and the general public.

- B. The working area is to be free from silt and debris when the Contractor leaves the site at the end of each visit.
- C. Open manholes, machinery and standing equipment shall be protected at all times.

### **3.03 LOCATION**

- A. The locations of sewers included in the Work are indicated in the Drawings.

### **3.04 TRAFFIC CONTROL**

- A. Refer to Specification Section 01500: Temporary Control of Construction Operations for requirements.

### **3.05 NOISE CONTROL**

- A. All work activities for preconditioning and cleaning sewers and manholes shall comply with the requirements of SC-11.6. The Contractor shall employ the “best practicable means” to minimize and mitigate noise as well as vibration resulting from operations. Mitigation measures shall include the utilization of sound suppression devices on all equipment and machinery particularly in residential areas and in the near vicinity of hospitals and schools, especially at night.

### **3.06 FENCING**

- A. All unattended open manholes and working areas shall be provided with temporary fencing and/or barriers meeting applicable Federal, State, and City of Atlanta standards and subject to the approval of the Engineer.

### **3.07 WORKING HOURS**

- A. Work hours are per the General Conditions of the Contract Agreement. No work shall be carried out at any other time including Saturday, Sunday and holidays without permission in writing from the Engineer except when the work is unavoidable or necessary for the saving of life or protection of property. In such case the Contractor shall immediately notify the Engineer.
- B. Work on principal highways and major roads shall be restricted to certain hours as directed by the Engineer and/or specified herein. The Contractor will be compensated through the appropriate Task Allowance for additional costs incurred when work hours are restricted.



**3.08 SCHEDULING OF WORK**

- A. After discussion with the Engineer, the Contractor shall prepare and submit a schedule of work that will meet the requirements of the City and the limitations imposed under the Contract Documents. The Contractor shall follow the approved schedule as specified in the General Conditions of the Contract.

**3.09 PROLONGED ABSENCE FROM SITE**

- A. If the Contractor will be absent from the work site, or part of the work site, for a prolonged period, he shall inform the Engineer, replace manhole covers, and clear any roadways of his equipment and materials, including temporary traffic control measures he may be using.

**3.10 OPERATIONAL REQUIREMENTS**

- A. Each preconditioning and cleaning unit and each CCTV/sonar unit shall carry sufficient numbers of guides and rollers such that, when cleaning and inspecting or surveying, all bonds (e.g. metal winch cable) are supported away from sewer and manhole structures.
- B. Each preconditioning and cleaning unit shall carry a range of flow control equipment, as opposed to bypass pumping equipment, for use in controlling the flow during the work. A minimum of one item of each size of equipment ranging from 4-inch to 24-inch diameter inclusive shall be carried.
- C. The system of silt and debris removal shall be capable of operating in such a way as to minimize the obstruction to sewer flows and preconditioning and cleaning operations.
- D. Basements, homes and all other vulnerable property shall be prevented from being flooded where hydraulic preconditioning and cleaning methods are used to precondition and clean manholes and sewers.
- E. The Contractor shall make his own arrangements for the secure “off road” overnight parking of his vehicles and cleaning equipment and shall comply with all relevant statutory traffic regulations and local laws.

**3.11 HANDLING AND DISPOSAL OF REMOVED MATERIAL**

- A. The Contractor shall remove all silt, debris, detritus, etc. resulting from all manhole and sewer preconditioning and cleaning activities at least once each working day. Such material shall be caught and collected in a suitable trap, weir, or dam within the manhole or chamber being preconditioned and cleaned and/or at the downstream manhole of the sewer segment being preconditioned and cleaned. The Contractor shall ensure that the capture

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Section 02511 – Preconditioning and Cleaning Manholes and Sewers

method or methods used effectively prevent silt migration downstream. Descriptions of such methods, including details of the equipment used, shall be provided to the Engineer on request.

- B. All material removed from sewers and manholes shall be deposited in suitable closed watertight containers such that the total amount removed can be easily measured if required. The Contractor is to give the Engineer such assistance as may be necessary in carrying out this measurement work.
- C. The type and capacity of containers to be employed for the holding and transport of the removed materials shall be determined by the Contractor. The Contractor shall not accumulate or store debris, silt, and/or liquid waste or sludge on site. Under no circumstances shall sewage, silt or solids be dumped onto the ground surface, ditches, catch basins or storm drains.
- D. The Contractor's work procedures shall be such that sewer preconditioning and cleaning work is not delayed by a lack of an empty container in which to deposit the materials removed from the sewer.
- E. The Contractor is advised that it may not always be possible for the container to be positioned immediately adjacent to the manhole from which materials are being removed and that "double handling" of the materials may be necessary. The Contractor shall provide for such "double handling" to be carried out safely and efficiently at no additional cost to the City.
- F. The Contractor must make his own arrangements for the proper disposal of materials removed from the sewer. The disposal site must be licensed to accept such materials and must be approved by the Engineer prior to commencement of the work. The Contractor shall be responsible for obtaining all necessary disposal permits and for complying with all state and City regulations for handling silt laden sewage.
- G. All costs associated with disposal permitting and silt handling must be included in the Contractor's rates for work.
- H. The containers for the disposal of materials removed from sewers and manholes shall be routed through an approved weigh station and a copy of each weight ticket submitted to the Engineer. Such tickets shall be used to determine the quantities of materials removed.

**3.12 WATER SUPPLY**

- A. Prior to the commencement of work, the Contractor shall locate all hydrants from which water may be obtained.
- B. The Contractor is responsible for making his own arrangements for obtaining water for the work, and he shall comply with all local conditions regarding the use of construction and flushing water. Such arrangements shall be approved by the Engineer prior to commencement of work.
- C. All details of the point of water connection, backflow protection, conveyance methods, draw-off rates, times and all local conditions regarding the use of water shall be approved by the Engineer prior to commencement of work. All equipment, labor, and material required for obtaining water for the work shall be provided by the Contractor.
- D. The Contractor shall provide constant attendance when water is being drawn off any hydrant.
- E. The Contractor must ensure that a 12-inch minimum air gap is maintained at the supply point on desilting/cleaning/jetting equipment or any other receiving apparatus.
- F. The use of any standpipe or hydrant, which has not been approved by the Engineer, is expressly forbidden.

**3.13 TRAVEL**

- A. The cost of all travel required in the completion of the specified work shall be included in the Contractor's rates for work.
- B. The cost of travel required for the completion of extra work for which unit costs are not included in the Contract shall be at rates documented in writing by the Contractor.

**3.14 SUPERVISION**

- A. A responsible representative of the Contractor shall be present on the site of the work, or other location approved by the Engineer, to provide supervision of the work. At all times, and especially when a change of work location is underway, the Contractor's representative shall keep the Engineer continuously aware of the location, progress, planned execution of the work, and problems encountered.

**3.15 COMMUNICATION**

- A. The Contractor's on-site representative directly responsible for the work shall be immediately reachable at any time during the normal working day and shall immediately respond to all questions and directions by the Engineer.
- B. Adequate means of communication by telephone, portable radio, or other electronic means of communication must be maintained at all times as part of the routine work methodology and in case of an emergency, between all points of activity along the length of the sewer being preconditioned and cleaned.

**3.16 DAMAGE TO MANHOLES OR SEWERS CAUSED BY CONTRACTOR**

- A. The Contractor shall use special care in his work methods and take all necessary precautions against improper use of the preconditioning and cleaning equipment to avoid damaging the sewer and/or manholes being preconditioned and cleaned. If in the Engineer's opinion, the Contractor's work has caused damage to the manhole or sewer, the Contractor shall repair the damage to the complete satisfaction of the Engineer at no additional cost to the City.

**3.17 RESPONSIBILITY FOR OVERFLOWS OR SPILLS**

- A. It shall be the responsibility of the Contractor to schedule and perform his Work in a manner that does not cause or contribute to incidence of overflows or spills of sewage from the sewer system.
- B. In the event that the Contractor Work activities contribute to overflows or spills, the Contractor shall immediately take appropriate action to contain and stop the overflow, clean up the spillage, disinfect the area affected by the spill, and notify the designated Engineer in a timely manner, all in accordance with the City's Emergency Response Plan.
- C. Contractor will indemnify and hold harmless the City for any fines or third-party claims for personal or property damage arising out of a spill or overflow that is fully or partially the responsibility of the Contractor, including the legal, engineering and administrative expenses of the City in defending such fines and claims

**PART 4A – GENERAL TECHNICAL EQUIPMENT SPECIFICATION - SEWERS****4A.01 GENERAL**

- A. The Contractor shall certify that sufficient cleaning units can be provided, including standby units in the event of breakdown, in order to complete the work within the contract period. Further, the Contractor shall certify that standby or back-up equipment can be delivered to the site within 48 hours in the event of equipment breakdown.
- B. The cleaning unit(s) shall be capable of operating routinely, up to a minimum of 500-feet from the point of access to the sewer.
- C. Each cleaning unit shall carry a mobile telephone to facilitate communication with the Engineer and to comply with relevant safety requirements defined in the safe working procedures approved by the Engineer for the execution of the work.

**4A.02 CCTV AND SONAR INSPECTION/SURVEY UNITS**

- A. All CCTV and sonar survey units shall comply with Specification Section 02752 unless otherwise determined.

**4A.03 WINCHING EQUIPMENT**

- A. Winching equipment shall be sufficient for the purposes of attaining the degree of cleanliness specified in Section 1.01A
- B. The Contractor shall provide conventional power winching equipment and all associated equipment, including winching buckets, balls, breakers, kites, scooters, scrapers, tires, tools and safety apparatus. Complete details of equipment proposed for use in preconditioning and cleaning shall be provided to the Engineer before work commences.
- C. Dredging of sewers shall be undertaken by passing various sized buckets, balls, breakers, kites, scooters, scrapers, tires etc, through the sewers to physically remove accumulated silt, sludge and other debris. Where conditions dictate, power boring equipment and/or winching equipment shall be used to loosen the silt prior to its removal. All necessary equipment including cables, lines, and tools must be available at all times as required.
- D. The equipment shall be capable of operating efficiently and effectively in the sizes of sewers and depth included in the project at distances of up to 500-feet between adjacent manholes.
- E. The project sewers convey sanitary sewage, storm water, or combined sewage flows. Certain Sections of sewer may be flowing entirely full or in a

## Section 02511 – Preconditioning and Cleaning Manholes and Sewers

surcharged condition and the Contractor must be prepared at all times to use manual pushing rods, mechanical boring equipment or other methods to pass a leading line through the sewer prior to commencing dredging operations with winching.

- F. Any item of CONTRACTOR plant or equipment associated with the Work, which may cause obstruction to the flow in the sewer, shall be removed from the sewer at the close of work each day. It shall be permitted to leave a line or winching cable through the sewer during breaks in the work.
- G. Dredging operations in a particular Section of sewer will generally proceed in a downstream direction, working between consecutive manholes using winch buckets of sizes stated below.
- H. The size of winch bucket used in sewers up to 48" shall be 90% of the sewer bore up to a maximum of 24". It is anticipated that buckets of smaller sizes than those stated will need to be winched through Sections of sewer prior to the use of the maximum sizes. The maximum size bucket as stated may be varied at the discretion of the Engineer. However, no buckets larger than these maximum sizes specified shall be used without the approval of the Engineer.
- I. The Contractor is advised that use of the maximum size buckets listed above may not be practical due to restricted access through manhole covers and other access points. The Contractor shall ensure that his working procedures will not be unduly affected by such restrictions and shall allow for inefficiencies due to all such restrictions in his unit rates.
- J. The winches used to draw buckets, balls, breakers, scooters, scrapers, or tires shall be power driven. They shall incorporate a torque-limiting device to prevent the breaking of winching lines in case the line becomes jammed by obstructions.
- K. Where the operational cleaning equipment is towed by winch and bond through the sewer, all winches shall be stable with either lockable or ratcheted drums. All bonds shall be steel or of an equally non-elastic material to ensure the smooth and steady progress of the equipment. All winches shall be inherently stable under loaded conditions.

**4A.04 PRESSURE JETTING EQUIPMENT**

- A. Pressure jetting equipment used shall be sufficient for the purposes of attaining the degree of cleanliness in sewers and manholes as specified in Section 1.01.

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Section 02511 – Preconditioning and Cleaning Manholes and Sewers

- B. Jetting units in sewers must be capable of jetting a minimum distance of 500-feet either upstream or downstream from a manhole. Minimum nominal hose size shall be one-inch diameter.
- C. The Contractor's unit prices specified in the bid form shall include jetting in sewers both upstream and downstream.
- D. Successive passes using constantly moving pressure jetting techniques shall be applied to sewers until they are cleaned to the level specified. Nozzle hold-time (stationary time), for any particular location, shall not be more than 60 seconds in order to forestall damage to the pipe being cleaned. Nozzles shall have jet angles of between 30° to 45°. “High efficiency nozzles” (discharging “pencil jets”) with jet angles higher than this figure shall not be allowed to be stationary at any time.
- E. Silt shall be collected at manholes as specified herein. No silt shall be allowed to pass beyond the Section of sewer being cleaned.
- F. Pass rates (rewind speed) for the jetting head shall be at a consistent speed without jerking and excessive variations. Typical pass rates shall be 4 inches to 8 inches per second. The hose reel shall be power driven in the rewind direction.
- G. Manual pressure jetting within manholes shall not be allowed. Progress towards the desired level of service specified in manholes may be monitored by a stem linked TV camera. Manhole pressure jetting for the purpose of cleaning or preconditioning shall be executed either:
  - 1. Manually from the ground surface, or
  - 2. Robotically within the manhole
- H. The Engineer shall be notified of the jetting equipment proposed by the Contractor in the bid documents. The jetting equipment will be operated utilizing the pressures specified unless otherwise noted elsewhere in the document. The proposed equipment shall be categorized from the following table:

## Section 02511 – Preconditioning and Cleaning Manholes and Sewers

**TABLE 4.4.1**

CATEGORY	MACHINE TYPE	CAPACITY (GALL/MINUTE)		PRESSURE (p.s.i.)	
		min	max	min	max
<b><u>Manholes</u></b>					
1	High pressure/low volume – trailers	1	35	3,000	10,000
2	<b>High pressure/low volume – mini</b>	9	35	3,000	10,000
3	High pressure/low volume – non HGV/HGV jetter/combination	9	35	3,000	5,000
<b><u>Sewers</u></b>					
4	Low pressure/high volume – HGV	30	50	1,500	2,000
5	Low pressure/high volume – combination	30	75	1,500	3,000
6	Low pressure/high volume – super combination	75	175	2,000	2,500
7	Low pressure/high volume – separate jumbo jetter/suction units	75	200	2,000	2,500
<b><u>Other</u></b>					

## Notes for Table 4.4.1

1. The categories listed are typical only of the equipment for use in the present contract. Exceptions to the duty and equipment shown above will be allowed subject to appropriate notification and approval. The Contractor is required to complete the table with details of any other equipment proposed.
2. Discretion shall be used concerning the maximum pressure used for cleaning sewers. In general for asbestos cement, clay and concrete pipes cleaning pressures shall be limited to 5000 psi (340 bar). For brick sewers cleaning pressures shall be limited to 3500 psi (240 bar). For pitch fiber and plastic pipes cleaning pressures will be limited to 1500 psi (102 bar) and 2500 psi (170 bar) respectively.
3. Cleaning pressures in concrete manholes shall be limited to 5000 psi (340 bar). Cleaning pressures in new brickwork manholes shall be limited to 5000 psi (340 bar) and in old brickwork manholes to 3500 psi (240 bar).



## Section 02511 – Preconditioning and Cleaning Manholes and Sewers

4. Higher pre-conditioning pressures in sewers and manholes prior to rehabilitation may be allowed at the sole discretion of the Engineer. The Engineer's agreement to use higher pressures shall not relieve the Contractor of his responsibilities for any resultant damage in accordance with the requirements of paragraph 3.16 above.
- I. Where a jetter is fitted with an airflow suction unit for removal of silt and other material from the sewer, it shall be capable of removing materials such as sludge, silt and bricks from depths up to 32-feet with minimum suction of 2500-cfm. A tank with a minimum capacity of 175-cf shall be provided and be capable of decanting collected liquids and conveying them back to the sewer. The suction hose of such a system shall have a minimum internal diameter of 6-inches.
- J. Jetting equipment shall be calibrated on an annual basis by an approved body and calibration certificates made available for inspection by the Engineer as requested. Such equipment shall be maintained on a regular basis in accordance with the manufacturer's Specification. The Contractor shall make available copies of his maintenance certificates and/or schedules to the Engineer as requested.
- K. An automatic pressure relief valve shall be incorporated on the pump discharge chamber to prevent the pressure exceeding the safe maximum for the system as a whole. This may take the form of a pressure relief valve of the bursting disc type in holder or an automatic pressure regulating valve (unloading valve).

**NOTE:** The maximum working pressure is the lowest value of the maximum working pressure ratings of all individual components of the system.

#### **4A.05 AIR DRIVEN, ELECTRO-MECHANICAL AND/OR MECHANICAL PRE-CONDITIONING AND CLEANING TOOLS**

- A. Where necessary, and additional to winching and pressure cleaning equipment, appropriate air driven, electrically driven and/or mechanical tools may be used to needle, hammer, scrape or grind off corroded concrete, scarify and remove compacted silt, chip-off spilt grout, detach encrustation, trim and cut laterals and roots, etc. The Contractor shall provide prior notification to the Engineer prior to the use of such equipment and techniques.

#### **4A.06 VENTILATION OF CONFINED SPACES**

- A. The Contractor shall provide, operate, maintain and subsequently remove on completion, adequate ventilation apparatus in the form of blowers

## Section 02511 – Preconditioning and Cleaning Manholes and Sewers

and/or fans. The ventilation apparatus shall introduce a fresh air supply to support a safe environment for work in sewers, manholes and all other confined spaces, which shall be kept free from dangerous, toxic and/or explosive gases, whether generated from sewage, soil strata or other source.

**PART 4B – GENERAL TECHNICAL EQUIPMENT SPECIFICATION - MANHOLES****4B.01 PRECONDITIONING AND CLEANING AS A GENERAL LEVEL OF SERVICE**

- A. With the exception of the “through flow” channel, all surfaces shall be thoroughly cleaned using high pressure water with sufficient pressure (minimum force of 3500 psi.(240 bar)) to achieve the specified level of preparation. Preconditioning and cleaning shall include the removal of all roots, corroded concrete, corroded rungs, intruding laterals and any other extraneous, loose material, debris or foreign matter using air driven, electrically driven or mechanical equipment as specified.
- B. Before preconditioning and cleaning work commences, silt, sand and debris traps shall be installed at the entrance to the downstream sewer to capture all silt and debris material.

**4B.02 PRECONDITIONING AND CLEANING PRIOR TO REHABILITATION AND REPAIR**

- A. All concrete and masonry surfaces to be rehabilitated or repaired shall be meticulously cleaned by water blasting utilizing a 210°F steam unit and appropriate nozzles to provide a contamination-free and sound surface. Other methods, such as wet or dry sand blasting, acid wash, concrete cleansers, degreasers or mechanical means, may be required to completely clean the manhole surface prior to rehabilitation or repair.
- B. All surfaces on which preconditioning and cleaning methods outlined in Paragraph 4B.02.A above have been used shall be thoroughly rinsed, scrubbed, and neutralized to remove cleaning agents and their reactant products before rehabilitation commences. Concrete surfaces shall be accepted for the purpose of rehabilitation when they are sound, surface dry, porous and free from dust, dirt, oil, grease, fat efflorescence, concrete hardening or sealing chemicals, previous coatings, rust, form-release agents, laitance, other penetrating contaminants, fins, surface projections, thin crusts, bridging voids, and loosely adhering concrete and dirt particles.
- C. All manhole “runner” and “gusher” infiltration leaks shall be sealed in areas where linings are to be installed. The Contractor will not be allowed to commence rehabilitation work until these leaks have been sealed to the satisfaction of the Engineer.

## Section 02511 – Preconditioning and Cleaning Manholes and Sewers

- D. Where required by the relevant manhole rehabilitation system, manhole surfaces to be rehabilitated shall have a pH of 7 to 10. Surfaces shall be tested in accordance with ASTM D4262.
- E. Where instructed by the Engineer, the Contractor shall test prepared surfaces by Swiss impact hammer or other physical method to determine soundness.

**PART 5 – QUALITY CONTROL/PRECONDITIONING AND CLEANING REPORT****5.01 GENERAL**

- A. A quality control video inspection of preconditioned and cleaned sewers shall be carried out as directed, immediately following completion of preconditioning and cleaning work. If a sewer or pipe line has not been preconditioned or cleaned as specified (by visual inspection, video review or field analysis) in the sole opinion of the Engineer, the sewer shall be re-preconditioned and cleaned in accordance with the Specification at no additional cost to the City.
- B. The Contractor shall supply one copy of inspection video for each reach of sewer completed.
- C. When required by the Engineer, the Contractor shall supply one copy of the full internal sewer condition assessment report, completed in accordance with the requirements of Specification Section 02752. This Specification includes a sample report sheet also reproduced at the end of this Specification. The sample report sheet shall be accurately and fully adopted in format and in detail and submitted by the Contractor immediately following the QA/QC inspection.

**5.02 DAILY LOG**

- A. The Contractor shall provide a report of work completed each day. The report shall be submitted to the Engineer no later than one workday following completion of the work. The report shall contain a separate sheet for each manhole and sewer reach preconditioned. The report shall utilize the form provided at the end of this Specification.
- B. The Contractor shall immediately notify the Engineer of any material such as bricks, concrete or broken clay pipe appearing in the materials removed from the sewers and/or manholes during preconditioning and cleaning activities.

## Section 02511 – Preconditioning and Cleaning Manholes and Sewers

**(EXAMPLE)**  
**CONFINED ENTRY LOG**  
**MANHOLE/ SEWER SAFETY CHECK**  
 (TO BE COMPLETED DAILY)

Date: \_\_\_\_\_ Supervisor: \_\_\_\_\_ Vehicle No. \_\_\_\_\_

Time	Manhole No.	Manhole Location
1.		
2.		
3.		
4.		
5.		

Workers on site: \_\_\_\_\_  
 (Underline those with safety training certification)

**Safety Apparatus on Site:** (tick)

Multi Gas Monitor ☐      Lifting Harness ☐      Lifeline ☐  
 Helmet/ Safety Boots ☐      First Aid Kit ☐      Torch Light ☐  
 Aluminum Ladder (AL) ☐      Air Blower ☐      Breathing Apparatus ☐  
 Headphone ☐      Cell Phone ☐

**Safety Check:** (tick)

Manhole Vented by Blower? ☐      Manhole Tested for Gases? ☐  
 Oxygen Sufficiency OK? ☐      Protective Clothing Worn? ☐  
 Top Men Carrying BA? ☐      Ladder Used ☐  
 Traffic Signs and Cones OK? ☐      Blinkers and Beacons OK? ☐      Site Plans? ☐

**Gas Monitoring Readings**

Time	Hydrogen Sulfide Level		Oxygen Level %	Carbon Monoxide Level		Methane Level	
	Detected (PPM)	Not Detected		Detected (PPM)	Not Detected	Detected (PPM)	Not Detected

Manhole/ Sewer Safe to Enter? ☐ Yes ☐ No      Incidents, if any: \_\_\_\_\_  
 (Append Lengthy Description)  
 Signature of Safety Officer/ Supervisor: \_\_\_\_\_ Date: \_\_\_\_\_

**PRECONDITIONING & CLEANING REPORT SHEET FORM 'A'**  
(TO BE COMPLETED DAILY)

Date \_\_\_\_\_  
 Crew \_\_\_\_\_  
 Site \_\_\_\_\_

Sheet \_\_\_\_ of \_\_\_\_  
 Time of Arrival \_\_\_\_\_  
 Time of Departure \_\_\_\_\_

Location (Street No., Easement Site)	U/S Manhole (Ref)	D/S Manhole (Ref)	Sewer Length (feet)	Unit Highway (Yes/No)	Sewer Material	Silt Depths @Manholes (inches)	Sewer Size (inches )	Length Cleaned (feet)	Upstream/ Downstream (U/S-D/S)	Comments
<b>Typical Comments (Initial)</b>	Emergency <b>(**EM**)</b>	Urgent Repair <b>(*UR*)</b>	Bad Joints <b>(BJ)</b>	Excessive Silt/Grease <b>(DES/DEG)</b>	Intense Odor <b>(O)</b>	Concrete Debris <b>(DECO)</b>	Roots (Size) <b>(R)</b>	High Levels <b>(HWL)</b>	Clayware Debris <b>(DEC)</b>	Number of Intruding Laterals (Size) <b>(CNI)</b>

Note: Continue on next line where extensive comments or space is required

Signed \_\_\_\_\_  
 (Engineers Representative)

Signed \_\_\_\_\_  
 (Contractors Representative)

END OF SECTION

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**SECTION 02725****Pipe-Bursting Method****PART 1 – GENERAL****1.01 SCOPE**

- A. This specification shall cover the rehabilitation of existing, gravity sanitary sewers and sewer service laterals. Acceptable pipe-bursting methods shall include pneumatic, static, push-pull (rod type) and TIM™. All work shall be performed only as directed by the Engineer or shown on the task order Drawings.
- B. Pipebursting is a procedure which encompasses a variety of equipment systems which commonly utilize a burster unit or expander to split the existing pipe while simultaneously pulling a new pipe into place. Acceptable pipe-bursting systems which are commonly used for gravity sewers utilize pneumatic and static type bursting units for installation of a continuous high density polyethylene (HDPE) pipe material between manholes. Other types of pipe-bursting systems are utilized to install segmented non-continuous ductile iron pipe are referred to as static push-pull or TIM™. The new pipe may be of the same size or larger size.
- C. The scope of work requires the Contractor to provide all materials, labor, equipment, and services necessary for bypass pumping and/or diversion of sewage flows, rehabilitation of existing sanitary sewers by bursting the existing pipe and inserting a new pipe, reconnection of active sewer service connections (service laterals), anchoring new pipe, restoring affected manholes, cleaning, CCTV inspection and final testing of the new pipe system.
- D. Pipe-bursting with new HDPE: Pneumatic or static pipe-bursting equipment systems are acceptable for installation of HDPE sewer piping. Pipe-bursting equipment shall be provided with either front or rear expanders for the proper connection to the polyethylene pipe. Pneumatic bursters must be used in conjunction with a constant tension hydraulic twin capstain winch; the size of the winch depends on the diameter of the pipe to be replaced. In no case is the constant tension on the winch to exceed 20 tons. Static bursters shall be equipped with blades or slitters for bursting existing ductile or cast iron pipe.
- E. Static Push-Pull Pipe-Bursting with new DIP: Acceptable push-pull pipe-bursting equipment systems shall utilize a hydraulic jack positioned in the retrieval pit along the existing pipe vertical and horizontal centerline which is used to install bursting rods through the existing pipe to the launch pit. The bursting head and expander shall be connected to the leading

bursting rod then retracted through the host pipe as each new pipe segment is connected at the launch pit. The rods shall be typically removed as they are retracted to facilitate installation of the new piping to the retrieval pit. Restrained joint piping shall be provided for all push-pull pipe-bursting installations where new DIP is directed by the Engineer or shown on the task order Drawings. Acceptable equipment systems are equal to Grundoburst® by TT Technologies, Inc. or Hydroburst™ by EarthTool Company, LLC.

- F. Tenbusch Insertion Method (TIM™) pipe-bursting with new DIP: This technique of pipe jacking may also be used for installation of new DIP. This type of equipment system utilizes the columnar strength of a segmented bell-less jacking pipe to advance the lead train through the existing pipe. The new pipe is to be jacked behind the lead train piece by piece by the jacking frame (in the work pit). The primary jacking frame shall apply the required thrust to advance the new pipe column (as the front jack is retracted). The pipe adapter section shall be fitted with a lubricant injection port where lubricant (polymer or bentonite) can be injected into the annular space surrounding the new replacement pipe as the pipe advances.
- G. The sewer replacement work details include:
1. Site Planning and Preparation:
    - a. Perform site investigation and record all pre-existing conditions of all structures within the immediate area, landscaping and/ or roadways prior to construction.
    - b. Perform initial CCTV inspection of sewer to be replaced (See Section 02752). Locate all active sewer service connections (laterals) and sags or blockages.
    - c. Formulate and execute plans for sag/blockage repairs, launching pipe excavation, layout for sewer bypass pumping system, marking existing utilities, service laterals, cleanout, etc.
  2. Pipe Installation:
    - a. If directed to do so by the Engineer, install cleanout at edge of property line or easement line for pipe-bursting.
    - b. Excavate launching and receiving pits.
    - c. Install sewer bypass pumping system.



## Section 02725 – Pipe-Bursting Method

- d. Excavate to relieve effects to existing utilities.
- e. Excavate to expose all active service connections (laterals).
- f. If directed to do so by the Engineer, provide bypass pump to extract flow from high-volume service connections (laterals).
- g. If directed to do so by the Engineer, temporarily disconnect/plug active service connections (laterals).
- h. Install new sewer pipeline by pipe-bursting methods.
- i. Install new manholes where required by the Engineer.
- j. Anchor pipe and seal manholes.
- k. If directed to do so by the Engineer, replace existing active service connections (laterals) from new or existing cleanouts and lamp holes to new sewer pipeline.
- l. Perform CCTV inspection of all active service laterals and remedy those determined to be defective.
- m. Reconnect all active service connections (laterals) to new sewer pipeline.
- n. Connect replacement pipeline to existing manholes. (See Section 02491)
- o. Perform post-installation cleaning and CCTV sewer inspection for quality control. (See Sections 02511 and 02752)
- p. Remove sewage bypass pumping system(s).
- q. Backfill and restore excavations. (See Section 02200)
- r. Perform pipeline testing. (See Section 02730)

Note that the items 1b, 2a, 2b, 2c, 2i, 2k, 2l and 2m above are paid for in other bid items. No other additional cost will be paid to the Contractor.

- 3. Cleanup and restore existing surface condition and structures.
- 4. Repair defective work per Engineer's final inspection.

- H. The Contractor is responsible for proper and accurate installation of the new sewer pipe regardless of the method described in this section and the following subsections. The Contractor shall ensure that the new pipe's vertical and horizontal alignment is as indicated on the plans and/or as existing in the field in accordance with these specifications.
- I. Supplying all labor, materials, equipment and apparatus not specifically mentioned herewith or noted on the plans, but which are incidental and necessary to complete the Work specified.

## 1.02 QUALIFICATIONS

- A. The Contractor shall be certified by the pipe-bursting system manufacturer as a fully trained and/or licensed user of the pipe-bursting system. Operation of the system shall be performed by trained personnel. Such training shall be conducted by a qualified representative of the system manufacturer.
- B. Polyethylene pipe jointing shall be performed by personnel trained in the use of butt-fusion equipment and recommended methods for new pipe connections. Personnel directly involved with installing the new pipe shall receive training in the proper methods for handling and installing the polyethylene pipe. Training shall be performed by a qualified representative of the fusion equipment manufacturer.
- C. Contractor shall hold the City and Engineer harmless in any legal action resulting from patent infringements.

## 1.03 STANDARD SPECIFICATIONS

- A. Except as otherwise indicated, the current editions of the following apply to the Work of this Section:
  - 1. ASTM D 1599 Test for Short Term Rupture Strength of Plastic Pipe, Tubing and Fittings
  - 2. ASTM D 1928 Preparation of Compression Molded Test Polyethylene Samples
  - 3. ASTM D 2122 Determining Dimensions of Thermoplastic Pipe and Fittings
  - 4. ASTM D 2321 Underground Installation of Thermoplastic Flexible Sewer Pipe

## Section 02725 – Pipe-Bursting Method

5. ASTM D 2412 External Loading Characteristics of Plastic Pipe by Parallel Plate Loading
6. ASTM D 2657 Practice for Heat-Joining Polyolefin Pipe and Fittings
7. ASTM D 3035 Specification for Polyethylene (PE) Plastic Pipe (DR\_DR) Based on Controlled Outside Diameter
8. ASTM D 3261 Specification for Polyethylene Plastic Pipe and Fittings Material
9. ASTM D 3550 Standard Practice for Ring Lined Barrel Sampling of Soils
10. ASTM F 477 Elastomeric Gaskets (Seals) for Joining Plastic Pipe
11. ASTM F 714 Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter (3.5" and larger)
12. AWS D1.1 AWS Standard Qualification Procedure
13. ASTM C 12 Standard Practice for Installing Vitrified Clay Pipe Lines
14. ASTM C 1208 Standard Specification for Vitrified Clay Pipe and Joints for Use in Jacking, Sliplining and Tunnels
15. ASTM C 828 Standard Test Method for Low Pressure Air Test of Vitrified Clay Pipe Lines
16. ASTM C 1091 Standard Test Method for Hydrostatic Infiltration and Exfiltration Testing of Vitrified Clay Pipe Lines
17. ASTM C 425 Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings
18. ASTM C 700 Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength and Perforated
19. ASTM C301 Standard Test Methods for Vitrified Clay Pipe

## 1.04 RELATED SECTIONS

- A. The Work of the following Sections applies to the Work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of Work.
1. Section 02511: Preconditioning and Cleaning Manholes and Sewers
  2. Section 02750: Wastewater Flow Control
  3. Section 02200: Earthwork
  4. Section 02730: Sewers and Accessories
  5. Section 02140: Dewatering

## 1.05 SUBMITTALS

- A. The following shall be submitted to the City in writing prior to or at the time indicated in accordance with General Condition Section 28. Failure to do so will prevent progression of the Work to the next stage:
1. Manufacturer's technical literature on the proposed pipe-bursting systems **(At Pre-Construction Meeting)**
  - 2.
  3. Written certification from the pipe-bursting system provider that the Contractor or Subcontractor is a trained and licensed installer **(At Pre-Construction Meeting)**
  4. Shop drawings, catalog data, and manufacturer's technical data showing complete information on material composition, physical properties, and dimensions of new pipe and fittings. Include manufacturer's recommendations for handling, storage, time for re-connection of laterals, joint welding and repair of pipe and fittings damaged **(At Pre-Construction Meeting)**.
  5. The Contractor shall prepare and submit, for the Engineer's approval, a general methodology of the Bursting Plan, including materials and equipment, lateral numeration and manhole restoration procedure and materials, by-pass pumping system accommodation and maintenance of intermediate flows and connections, plan of operation, construction and restoration of

existing sewer service connections **(At Pre-Construction Meeting)**.

6. The Contractor shall prepare and submit, for the Engineer's approval, a general methodology for dealing with possible ground heave shall be fully detailed both in relation to:
  - a. Restoration of Landscape areas-restoration of ground contours and surface treatment to meet the reasonable requirements of the property owner, and
  - b. Structures: Pre-installation of monitoring devices where the adverse effect of pipe bursting could worsen existing structural defects in buildings and/or other structures. **(At Pre-Construction Meeting)**
7. Certification of workers trained for welding and/or installing pipe **(At Pre-Construction Meeting)**.
8. Static Push-Pull Pipe bursting or TIM™: Submittals shall include shop drawings and calculation of columnar strength of the pipe. The drawings shall show dimensions of pipes including inside diameter and wall thickness, details of pipe joints and gaskets showing cushion packing ring (if required) and laying length of each pipe. **(30 Calendar Days before Bursting)**
9. Pre installation CCTV inspection reports and videos. Pre installation reports and videos shall be provided no later than 30 calendar days before pipe-bursting **(30 Calendar Days before Bursting)**.
10. Manhole invert rebuilding method and materials **(30 Calendar Days before Bursting)**
11. A detailed methodology for each set up during the course of the contract, but not less than ten days before bursting is planned to commence. This detailed methodology shall be agreed upon between the contractor and the Engineer. **(10 Calendar Days before Bursting)**
12. Drawings and design calculations demonstrating adequacy of any proposed temporary work including excavation, locations, sheeting and shoring, method of dewatering, other utilities that may be affected; width and length of working area access pit and portions of existing sewer to be removed to conduct the Work. **(10 Calendar Days before Bursting)**

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13. Seismic Monitoring Plan (if required), including details of Licensed Structural Engineer to be used for building surveys **(10 Calendar Days before Bursting)**
14. A written verification at least 2 days before commencing bursting that the sewer is free of obstructions and debris and is in suitable condition for bursting. **(2 Calendar Days before Bursting)**
15. Post installation CCTV inspection reports and videos. Post installation reports and videos shall be provided within 10 calendar days after pipe installation and include reinstatement of all laterals **(Within 10 Calendar Days of Bursting)**.
16. Process Control Sheet to include equipment tensile or compressive load information, excavation reinstatement, tap cut information and pre and post submittal follow up record/survey inspection report, alignment inspection where bursts are complete. **(Within 10 Calendar Days of Bursting)**
17. HDPE Repair Methods [If required] **(Before Repairs Are Made)**

## 1.06 TRIAL TEST AND METHODOLOGY REVIEW

- A. The Contractor shall comply with the following conditions before a pipe bursting technique becomes accepted as a viable option on a repeat basis:
  1. A successful demonstration for a trial length of sewer pipeline, chosen by the Engineer, which requires pipe-bursting shall be carried out including type and quality control tests as recommended by the manufacturer and in compliance with industry standards.
  2. The Contractor shall include and allow for representation by the equipment manufacturer if requested and further requirement of the Engineer, subsequent to the trial, to modify the equipment, material and/or installation methodology in order to complete the Work satisfactorily and meet all testing standards at no cost to the City.
  3. The Engineer shall formally accept the Contractor as having successfully completed the trial stage should this be the case.

## PART 2 – PRODUCTS

### 2.01 MATERIALS

- A. Polyethylene Plastic Pipe shall be high-density solid wall polyethylene pipe (HDPE) in accordance with specifications in Section 02730, subsection 2.04.
1. Sizes of the insertions to be used shall be as indicated or specified to renew the sewer to greater flow capacity.
  2. All pipes shall be made of virgin material. No reworked material shall be used except that obtained from the manufacturer's own production of the same formulation.
  3. The pipe shall be homogenous throughout and shall be free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.
  4. Dimension Ratios: The minimum wall thickness of the polyethylene pipe shall be SDR 17 throughout.
  5. Material color shall be light gray. Light gray interior color of pipe shall allow easier/better viewing for television inspection.
  6. Product shall be equal to Driscoplex, manufactured by Chevron Phillips.
- B. Restrained Ductile Iron Pipe (DIP) installed by static push-pull methods shall be centrifugally cast with low profile bells manufactured in accordance with the requirements of ANSI/ AWWA C151/A21.51 and requires a provision of specially designed pulling head by the pipe manufacturer which is compatible pipe joint. In no instance, shall the pulling force exceed the manufacturer's recommendation.
1. Minimum 350 pressure rating.
  2. Boltless restrained joint design capable of developing a minimum 20,000 pound allowable dead end thrust pulling force without separation or permanent deformation.
  3. Pipe lay lengths shall be the maximum allowable length depending upon the field conditions and in no case less than 8'-0".
- C. Ductile Iron Jacking Pipe (DIP) installed using the TIM™ method shall be ductile iron gravity service push pipe suitable for direct jacking or pushing pipe installation method to be employed.
1. Joints shall be precision cast and/or equipped with a compression cushioning ring to efficiently transfer and distribute the jacking loads through the joint, therefore maximizing the potential length of

## Section 02725 – Pipe-Bursting Method

installation. The allowable jacking strength capacity of pipe shall be capable of withstanding the maximum jacking forces to be imposed by the operations.

2. Minimum wall thicknesses shall be adequate to withstand the maximum anticipated jacking loads.
  3. Pipe lining shall be fusion bonded epoxy type with a nominal thickness of 60 mils to prevent potential cracking and or spalls during installation. Cement lining will not be allowed. Acceptable lining products are those equal to Polybond Plus manufactured by American Cast Iron Pipe Company.
  4. The installed pipe shall be capable of providing a positive seal for gravity or low head applications up to 100 feet (43 psi).
  5. Product shall be equal to GS Push Pipe Manufactured by American Cast Iron Pipe Company.
  6. Pipe shall conform to Specification Section 02730 except as otherwise specified in this Section.
- C. Vitrified Clay Pipe (VCP) installed by TIM™ shall be vitrified clay jacking pipe suitable for the direct jacking or pushing pipe installation method to be employed.
1. Pipe shall be manufactured of vitrified clay according to ASTM C 1208. Pipe shall be specifically designed and certified for the jacking application by the pipe manufacturer. The allowable jacking strength capacity of pipe shall be capable of withstanding the maximum jacking forces to be imposed by the operations.
  2. Nominal pipe lengths shall be submitted to the Engineer for approval prior to installation. Lengths shall be customized to accommodate limited space for launching/receiving pits as needed.
  4. Push fit joints shall be precision machined and equipped with an integral compression cushioning ring to efficiently transfer and distribute the jacking loads through the joint, therefore maximizing the potential length of installation. The joints shall consist of a seat, and polyurethane or elastomeric sealing element, a stainless steel sleeve and a compression cushion ring. The jointing sleeve shall be of AISI Type 316 stainless steel. The jointing seals shall be made of polyurethane or EPDM rubber, or other approved elastomeric material. The compression cushion ring between the joint ends shall conform to ANSI 280.1.



5. Saddles, repairs and other connections to the vitrified clay pipe may be sealed with an approved epoxy resin. The epoxy resin shall be Epibond 157 manufactured by Furane Plastics; WR623 A&B manufactured by Wyndam Chemicals, Inc.; EPON 828 manufactured by Shell Chemical Corp., Wyn-Stik ES-23 A&B or ES-4 A&B , manufactured by PTW&M Industries, Inc. or approved equal.
6. VCP Pipe products shall be equal to those manufactured by Can Clay Corporation.

## **2.02 DELIVERY, STORAGE, AND HANDLING**

- A. Transportation, handling, and storage of the pipe and fittings shall be as recommended by manufacturers.
- B. If new pipe and fittings become damaged before or during installation, it shall be repaired as recommended by the manufacturers or replaced as required by the Engineer at the Contractor expense, before proceeding further.
- C. Deliver, store and handle other materials as required to prevent damage.

## **2.03 MATERIAL TESTS**

- A. A certificate shall be furnished by the manufacturer for all material furnished under this specification. Pipe and fittings may be rejected that do not meet any requirements of this specification.
- B. Upon request by the Engineer, the Contractor shall furnish samples for material tests by the City's independent laboratory demonstrating compliance with Specification Section 02730 for HDPE pipe and fittings to verify the required physical properties and characteristics of supplied materials. The City shall pay for tests on pipe samples that meet specification requirements. Contractor shall pay for failed tests and re-testing of failed materials.

## **2.04 EQUIPMENT**

- A. The pipe-bursting tools shall be designed and manufactured to force its way through existing, pipe materials, by fragmenting the pipe and compressing the old pipe sections into the surrounding soil as it progresses. The bursting unit shall generate sufficient force to burst and compact the existing pipeline. See manufacturer's specifications for appropriate tool sizing for various pipe diameters, as well as parameters of tool sizing for percentage of upsize allowed.

- B. Pneumatic or static pipe-bursting tool bursting head shall be pulled through the existing sewer by a winch or jack located at the reception manhole when installing new HDPE or DIP. The bursting unit shall pull the pipe with it as it moves forward. The bursting head shall incorporate a shield/expander to prevent collapse of the hole ahead of the pipe insertion. The pipe-bursting unit shall be remotely controlled.
1. The bursting action of the tool shall increase the external dimensions sufficiently, causing breakage of the pipe at the same time expanding the surrounding ground. This action shall not only break the pipe but also create the void into which the burster can be winched or towed by extension rod and enable forward progress to be made. At the same time the pipe, directly attached to the sleeve on the rear of the burster shall also move forward.
  2. For HDPE pipe installations, the burster shall have its own forward momentum while being assisted by winching. A hydraulic winch shall give the burster friction by which it can be move forward. To form a complete operating system, the burster must be matched to a constant tension hydraulic winching system.
- C. The tenbusch insertion method (TIM™) equipment shall be utilized to jack the new pipe into the existing sewer by using the new pipe as a support column. The front jack advances the bursting unit into the existing pipe independent of the advance of the new pipe column. The new pipe is jacked behind the bursting unit piece by piece by the jacking frame (in the work pit). The primary jacking frame applies the required thrust to advance the new pipe column (as the front jack is retracted). Instrumentation and controls at the operator's control panel (at the jacking frame) shall allow the operator to control the jack through the existing pipe as the new pipe column and bursting unit are "inch-wormed" into the existing sewer.
1. The jacking system shall be capable of continuously monitoring the jacking pressure, the rate of advancement and the distance jacked.
  2. The jacking equipment shall have the capability of limiting the jacking force applied so as not to exceed the maximum compressive loads allowed for the replacement pipe.

## **PART 3 – EXECUTION**

### **3.01 EXISTING UTILITIES AND OBSTRUCTIONS**

- A. Refer to Section 02730, subsection 3.01

### **3.02 SEWER SERVICE CONNECTIONS**

- A. Refer to Section 02730, subsection 3.06 for service reconnections.

### **3.03 EXISTING FLOW**

- A. The Contractor shall provide bypass pumping as detailed in Specification Section 02750 – Wastewater Flow Control.
- B. The Contractor shall be responsible for maintaining continuous sanitary sewer service to each property connected to the segment of sewer subject to pipe bursting operations.
- C. If sewage backup occurs and enters buildings, the Contractor shall be responsible for clean-up, disinfection, repair, property damage, as well as resultant costs and claims.

### **3.04 PRE-INSTALLATION CCTV INSPECTION**

- A. Pipelines that will be upgraded by pipe-bursting and shall be televised (CCTV) in conformance with the City of Atlanta Specification for Internal Sewer Condition Assessment for CCTV sewer inspection. (Section 02752)

CCTV inspection conditions shall include the following:

1. Preconstruction video CDs shall be available for viewing by the Engineer before construction begins and throughout the project.
2. Video CDs shall remain property of the City. Contractor shall retain second copy for internal use.
3. All flows tributary to reach of sewer being inspected are to be completely by-passed around the reach during preconstruction inspection if necessary and required by the City.
4. If any portion of the inspection video is of inadequate quality or coverage, as determined by the City, the Contractor will have the portion re-inspected at no additional expense to the City.

### **3.05 CORRECTION OF PIPE SAG OR BLOCKAGE**

- A. Significant sags in the sewer pipe or a blockage must be corrected prior to renewing the sewer pipe by pipe bursting. Correction will be accomplished by point repair as specified in Section 02757.

### 3.06 CONSTRUCTION METHOD

- A. Equipment used to perform the Work shall be located away from buildings in order to minimize noise impact, which under all circumstances shall be less than 70 dB unless otherwise allowed by the Engineer due to circumstances beyond the Contractor or pipe-bursting Subcontractor. A silent engine compartment with the winch shall be provided to reduce machine noise.
- B. The Contractor shall install all pulleys, rollers, bumpers, alignment control devices and other equipment required to protect existing manholes, and to protect the new pipe from damage during installation. Lubrication may be used as recommended by the manufacturer. Under no circumstances shall the pipe be stressed beyond its elastic limit (polyethylene) or compressive or tensile limit (vitrified clay and ductile iron).
- C. Installed polyethylene pipe shall be allowed to relax and cool following installation in accordance with the manufacturer's recommended time, but not less than a minimum of four (4) hours prior to any reconnection of service lines, scaling of the annulus, or backfilling of the insertion pit, unless otherwise allowed by the Engineer. Sufficient excess length of new pipe, but not less than four (4) inches, shall be allowed to protrude into the manhole to provide for further length reduction. End restraint of pipe ends shall be achieved by means of Central Plastics Electrofusion couplings, or approved equal. The Electrofusion couplings shall be slipped over pipe ends against manhole wall and fused in place. Installation of all electrofusion couplings shall be carried out in accordance with the manufacturers recommended procedures.
- D. Following a relaxation period of four (4) hours for polyethylene pipe, the annular space shall be sealed. Sealing shall be made with a 1/4" to 1/2" diameter activated oakum band soaked in pre-polymer urethane resin sealant equal to AV-219 manufactured by Avanti International. Seal annular space circumferentially at the gap and extend sealant a minimum of four (4) inches through the manhole wall into the manhole in such a manner as to form a smooth, uniform, watertight joint. The terminating pipe ends in manholes shall be connected by Central Plastics Electrofusion couplings, or approved equal, to eliminate ground water infiltration. Installations of electrofusion couplings shall be installed in accordance with the manufacturers recommended procedures.
- E. Vitrified clay and ductile iron terminating pipe ends in manholes shall be connected to manholes in accordance with Section 02730.

- F. If an existing structure or utility is closer than fifty feet from a bursting unit, the Contractor shall use the services of a seismic monitoring company to record any disturbance to the structure or utility. The peak particle velocity resulting from bursting shall not exceed the following frequencies:
  - 1. Less than 3 Hz: 0.2 inches/second
  - 2. 3– 10 Hz: 0.5 inches/second
  - 3. 10 – 40 Hz: Varying linearly 0.5 to 1.0 inch/second
  - 4. Greater than 40 Hz: 1.0 inches/second
  - 5. The above limits are adopted from modified blasting level criteria given in U.S. Bureau of Mines Recommendations RI-8507. No bursting will be allowed until the monitoring instrument(s) are in place and a monitoring plan is submitted to the Engineer.
  - 6. If the diameter of the pipe to be replaced is less than 18 inches, then existing structures within 25 feet of the bursting unit shall receive a full structural survey by a Georgia licensed Engineer. If the diameter of the pipe to be replaced is 18 inches and greater, then existing structures within 50 feet of the bursting unit shall receive a full structural survey by a Georgia Licensed Engineer.
- G. The Contractor shall use pipe-carrying rollers to keep polyethylene pipe above flowers, shrubs, and other vegetative or structural landscaping features that could be damaged by contact with the pipe.
- H. Protection and restoration of work area disturbance to the ground surface resulting from heave during pipe-bursting shall be corrected to meet the Engineer's requirements and the area shall be restored in accordance with the Specifications.
- I. Install anti-flotation measures for polyethylene pipe wherever ground cover will be less than four feet (4 ft) and is below the groundwater level. Refer to Section 02730. Ensure that bursting can proceed under shallow depth conditions without detrimental ground heave or loss of control of bursting head.

### **3.07 POST-INSTALLATION CCTV INSPECTION**

- A. All costs associated with the post-installation CCTV inspection shall be considered incidental to the pipe-bursting work.

- B. Following the installation of the new pipelines, CCTV inspection shall be performed in accordance with the requirements of the City of Atlanta Specification of Internal Sewer Condition Assessment (Section 02752 in these Specifications). The finished video shall be continuous over the entire length of the sewer between two manholes and shall be completely free from visual defects.
- C. Defects, which may affect the integrity or strength of the pipe in the opinion of the Engineer, shall be repaired or the pipe replaced at the Contractor's expense.
- D. Video shall remain property of the City. Contractor shall retain second copy for internal use.
- E. The post-installation CCTV inspection shall take place as shortly after completion of each section as is feasible, but in no case more than ten (10) calendar days thereafter. The contractor is required to submit the post-installation CCTV videos within ten (10) calendar days of completing the rehabilitation of a segment of the sewer. Post construction video and a CD-ROM conversion of the documented videos shall be submitted to the City before final invoices, reduction of retainage or release of any retainage withheld.
- F. If any portion of the inspection tapes is of inadequate quality or coverage, as determined by the City, the Contractor will have the portion re-inspected and video taped at no additional expense to the City.

### **3.08 HDPE PIPE JOINING**

- A. The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint in strict accordance with the manufacturer's instructions and ASTM D 2657. Threaded or solvent-cement joints and connections are not permitted.
- B. All equipment and procedures used shall be used in strict compliance with the manufacturer's instructions and recommendations. Fusing shall be accomplished by personnel who are certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment.
- C. The butt-fused joint shall be true alignment and shall have uniform rollback beads resulting from the use of proper temperature and pressure. The joint shall be allowed adequate cooling time before removal of pressure. The fused joint shall be watertight and shall have tensile strength equal to that of the pipe.
- D. All joints shall be subject to acceptance by the Engineer and/or Engineer's representative prior to insertion. All defective joints shall be cut out and

replaced at no cost to the City. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness, shall not be used and must be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the procedures stated above.

- E. Any section of the pipe having other defects such as concentrated ridges, discoloration, excessive spot roughness, pitting, variable wall thickness or any other defect of manufacturing or handling as determined by the Engineer and/or his representative shall be discarded and not used.
- F. Terminal sections of pipe that are joined within the insertion pit shall be connected with Central Plastics Electrofusion Couplings or connectors with tensile strength equivalent to or greater than that of the pipe being joined.

### **3.09 INFILTRATION AND EXFILTRATION TESTING**

- A. Pipelines rehabilitated and replaced shall be tested for watertightness in accordance with Specification Section 02730. This applies to ductile iron, HDPE and vitrified clay replacement pipe. All inlets to the system shall be effectively closed and any residual flow shall be deemed to be infiltration.
- B. Notwithstanding the satisfactory completion of the above test for pipelines, if there is any discernible flow of water entering rehabilitated pipelines or manholes, at a point that can be located by visual or CCTV inspection, the Contractor shall take such additional measures required by the Engineer to stop infiltration at the Contractor's expense.
- C. All costs associated with the watertightness test and foregoing requirements shall be considered incidental to the work and shall be included in the unit price.

### **3.10 POST INSTALLATION DEFLECTION**

- A. All polyethylene pipe installed by pipe-bursting shall be subjected to a visual deflection check to determine if ovality greater than 10% exists by observation of the post installation CCTV inspection.
- B. The deflection test shall be performed by the Contractor in the presence of the Engineer. All costs associated with the deflection test and foregoing requirements shall be considered incidental to the pipe-bursting work and shall be included in the unit price for pipe-bursting.

## **PART 4 – WARRANTY**

### **4.01 MATERIAL WARRANTY**

- A. A written guarantee of 5 years, submitted to the City for the specific project, shall be provided by the Manufacturer against any breakdown of the polyethylene pipe material effectiveness.

### **4.02 WORKMANSHIP WARRANTY**

- A. A written guarantee of 2 years minimum shall be provided by the Contractor against any shortcoming in Workmanship.

END OF SECTION



## Attachment A

### PROCESS CONTROL SHEET - PIPE BURSTING (Following Mainline or Lateral Burst)

The Contractor shall complete a Process Control Sheet for each pipeline replaced and shall submit a copy to the Engineer immediately following the bursting operation and it's inspection. The Process Control Sheet shall include the information below as a minimum unless otherwise modified by the Engineer. In the event there are more than one inspector or contractor confirming the process completion per form, each section should be initialed by the performing inspector. All sections that were not completed due to lack of applicability to the replacement method used should have "N/A" entered.

Date(s) Rehabilitation Carried Out:

Date Process Control Sheet Completed:

General Process Control Section		
- state whether process control sheet completed for Mainline , or Lateral		
General	WEATHER ETC: Prior to Commencing Burst (include air temperature)	
	During Burst (include air temperature)	
	Number of Cleanouts?	
	LATERAL CONNECTION(S): • Type - circle	SIDE CROWN SPRINGING INVERT --straight entry --bend entry
	• Number (ea), Clock ref. from US MH	NO.....
	• Sizes (in)	
	Laterals Rehabbed? Type and Distance (ft) from Upstream MH Complete separate form for laterals Pipe-burst or CIPP lined.	
	Number of Local Repairs. Type and Distance (ft) from Upstream MH or from Mainline	
	Confirm all surface structures adjacent to burst inspected, recorded if defective, and structurally adequate for work to proceed. <input type="checkbox"/> Yes <input type="checkbox"/> No	If no explain here:
	Confirm line CCTV'd and agreed bursting viable <input type="checkbox"/> Yes <input type="checkbox"/> No	If no explain here:
Confirm line cleaned and prepared for bursting <input type="checkbox"/> Yes <input type="checkbox"/> No	If no explain here:	
Location	Upstream Manhole ID <input type="checkbox"/> Entry <input type="checkbox"/> Reception	MH#
	Downstream Manhole ID <input type="checkbox"/> Entry <input type="checkbox"/> Reception	MH#
	Intermediate Manhole ID(s), if applicable	MH#
	Street Name(s)/Address <input type="checkbox"/>	
Material Composition Details	INSTALLED PIPE: • Welded length (ft) • Installed length (ft) • Material - circle one	HDPE PVC DIP CLAYWARE OTHER (state):
	MANHOLE COUPLING/ <input type="checkbox"/>	
	MAINLINE CONNECTION: • Type <input type="checkbox"/> and Number (ea)	
	• Nominal Sewer Size (in)	
Pipe Installation	INSTALLATION METHOD **	
	Bursting Time	Start Time Finish Time
	Relaxation Time	Start Time Finish Time
	Taps - Installation Dates not applicable	Start Date Finish Date
	List Taps and Footages (ea) not applicable	
	List Abandoned Service Footages (ea) not applicable	
	WINCH DETAILS: • Type / Make • Load Capacity	
By Pass /Reinstate Flow	By Pass Commenced (Date/Time) not applicable	
	Main Flow Reinstated (Date/Time) not applicable	
	Excavations Reinstated and Accepted ? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Welding HDPE	WELDING DETAILS: • Date / Time	
	• Number of Welds	
	DAMAGE RECTIFICATION, IF ANY: • Footage ? Rectification?	
	WELD TESTS: • Method	
	• Failures? Rectification?	
Signatures	<b>Contractor</b> By signing below, I agree that the above General Process Control section has been inspected and confirmed. I understand that I have the right to indicate, by my initials, which sections I am confirming if I have not completed all of the inspections myself. I am aware that all sections left blank will be considered incomplete and may be sent back with request for additional information. Type/Print Name Here	<b>Inspector</b> By signing below, I agree that the above General Process Control section has been inspected and confirmed. I understand that I have the right to indicate, by my initials, which sections I am confirming if I have not completed all of the inspections myself. I am aware that all sections left blank will be considered incomplete and may be sent back with request for additional information. Type/Print Name Here
	Signature X	Signature X

OVER

Contractor Specific Process Control Section		
Material Composition Details	PIPE MATERIAL:	
	• Manufacturer / Joint Type	
	• Nominal Pipe Size	
	• Actual Inside Diameter (in)	
	• Wall Thickness (in) or Class	
Seismic Monitoring	SEISMOMETER: <input type="checkbox"/> Yes <input type="checkbox"/> No	
	• Type/Make	
	• Range	
	• Calibrated?	
	• Crack Monitor Results (if applicable)	
	• Red Zone Incident (s)?	
	• Yellow Zone Incident (s)?	
	• Other - Range	
Contractor Signatures	<p align="center"><u>Contractor</u></p> <p>I agree that the above Contractor Specific Process Control Section is complete and accurate to the best of my knowledge. I understand that all sections that are left blank will be considered incomplete sections and may be sent back for additional information.</p> <p>Type Name Here</p>  <p>Signature <u>X</u></p>	

\* Red Zone - > 0.75 inch per second < 1.0 inch per second; Yellow Zone >0.5 inch per second< 0.75 inch per second

\*\* Please indicate which method was used: e.g., Pneumatic (P), Static (S), Other (Tennbusch, Hydraulic)

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**SECTION 02730****Sewers and Accessories****PART 1 – GENERAL****1.01 SCOPE**

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

**1.02 QUALIFICATIONS**

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

**1.03 SUBMITTALS**

- A. If required by the City or Engineer, complete product data and engineering data shall be submitted to the Engineer in accordance with the requirements of General Condition Section 28 of the Contract Documents.

**1.04 TRANSPORTATION AND HANDLING**

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

**1.05 STORAGE AND PROTECTION**

- A. Make arrangements for the use of suitable storage areas for piping and other materials required for the Work.
- B. Stored materials shall be kept safe from damage. The interior of all pipes, fittings and other appurtenances shall be kept free from dirt or foreign matter at all times.
- C. Pipe shall not be stacked higher than the limits recommended by the manufacturer. The bottom tier shall be kept off the ground on timbers, rails or concrete. Pipe in tiers shall be alternated “bell, plain end,” “bell, plain end.” At least two rows of timbers shall be placed between tiers and chocks, affixed to each other in order to prevent movement. The timbers shall be large enough to prevent contact between the pipes in adjacent tiers.
- D. Store joint gaskets in a cool location, out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.
- E. PVC pipe and fittings shall not be stored in direct sun light.

**1.06 QUALITY ASSURANCE**

- A. Product manufacturers shall provide the Engineer with written certification that all products furnished comply with all applicable provisions of these Specifications.
- B. If ordered by the Engineer, each pipe manufacturer shall furnish the services of a competent factory representative to supervise and/or inspect the installation of pipe. This service will be furnished for a minimum of five days during initial pipe installation.
- C. Upon request by the Engineer, the Contractor shall furnish samples for material tests by the City’s independent laboratory demonstrating compliance with this Specification to verify the required physical properties and characteristics of supplied materials. The City shall pay for tests on pipe samples that meet specification requirements. Contractor shall pay for failed tests and re-testing of failed materials.

**PART 2 – PRODUCTS****2.01 DUCTILE IRON PIPE (DIP)**

- A. Ductile iron pipe shall be utilized where shown on the Drawings or directed by the Engineer.
- B. Ductile iron pipe shall be manufactured in accordance with AWWA C151. All pipes, except specials, shall be furnished in nominal lengths of 18 to 20 feet. Sizes will be as shown on the Drawings. All pipes shall have a minimum pressure rating as indicated in the following table, and corresponding minimum wall thickness, unless otherwise specified, or shown on the Drawings. Pipe wall thickness shall be determined based on dead loads indicated on the Drawings and the anticipated live loads, assuming a minimum HS 20 live load.

Pipe Sizes (inches)	Pressure Class (psi)
4 - 12	350
14 - 20	250
24	200
30 - 60	150

- C. Fittings and Accessories:
- Fittings shall be ductile iron and shall conform to AWWA C110/ANSI A21.10 or AWWA C153/ANSI A21.53, with a minimum rated working pressure of 250 psi.
  - Flanged elbow fittings shall be ANSI pattern using short radius elbows, except where noted differently on the Drawings. Special fittings, ductile iron wall pipes and sleeves shall conform to the dimensions and details as shown on the Drawings.
- D. Joints for Ductile Iron Pipe and Fittings:
- General:
    - Joints for ductile iron pipe and fittings shall be mechanical joints, restrained, flanged or push-on joint as specified herein or in Section 02725.

- b. Unless otherwise shown on the Drawings, specified or directed, all ductile iron pipe laid underground shall be joined using push-on type joints.
  - c. In all cases, gaskets shall be made of material that will not be damaged by the fluid being transported or by the environment in which the pipe is installed.
  - d. Provide the necessary bolts for connections. All bolts and nuts shall be threaded in accordance with ANSI B1.1, Coarse Thread Series, Class 2A external and 2B internal fit. All bolts and nuts shall be made in the U.S.A.
- 2. Mechanical Joints:
  - a. Joints shall conform to AWWA C111/ANSI A21.11.
  - b. Bolts and nuts shall be Tee Head Bolts and nuts of high strength low-alloy steel in accordance with ASTM A 242 to the dimensions shown in AWWA C111/ANSI A21.11.
  - c. Gaskets shall be in accordance with AWWA C111/ANSI A21.11 and shall be constructed of plain rubber.
  - d. Mechanical joint glands shall be ductile iron.
- 3. Push-On Joints: Push-on joints and gaskets shall conform to AWWA C111/ANSI A21.11. Details of the joint design shall be in accordance with the manufacturer's standard practice such as ACIPCO "Fastite," McWane (Clow) "Bell-Tite," or U.S. Pipe "Tyton" joints.
- E. Linings & Coatings: Sewer pipe and fittings shall be cement lined in accordance with ANSI/AWWA C104/A21.4.
- F. Polyethylene Encasement: Polyethylene film shall meet the requirements of AWWA C 105.
- G. Wall Sleeves and Wall Pipes:
  - 1. Where piping passes through concrete structures, furnish and install wall sleeves unless wall pipes or other provisions are specifically shown on the Drawings. Wall sleeves shall be accurately located and securely fastened into position before concrete is poured.
  - 2. Wall Sleeves:

- a. For pipe sizes smaller than 3-inches, wall sleeves shall be steel oversize sleeves furnished with a full circle, integral or continuously welded waterstop collar. The sleeve seal shall be the mechanically expanded, synthetic rubber type. Provide all associated bolts, seals and seal fittings, pressure clamps, or plates necessary to achieve a watertight installation. Sleeves shall extend the full thickness of the concrete. Sleeves and seal shall be Link Seal.
- b. For larger pipe sizes, wall sleeves shall be ductile iron mechanical joint wall sleeves. Unless specified or shown otherwise for a specific situation, wall sleeves shall be mechanical joint bell-plain end types with waterstop/thrust collar. The collar shall be capable of withstanding a thrust force caused by a 250 psi dead end load from either direction on that size pipe. Sleeves shall be constructed with studs and mechanical joint retainer gland on the air side of the concrete structure. Provide retainer gland where shown on the Drawings. Where the concrete structure is exposed to dirt on one side and is wet on the other side, construct with studs and glands on the dirt side. Wall sleeves shall be equal to ACIPCO A-10771.

3. Wall Pipes:

- a. Wall pipes shall be either ductile iron with integral waterstop/thrust collar or centrifugally cast ductile iron with a continuously welded waterstop/thrust collar. The welded on collar shall be attached to the pipe by the manufacturer. The collar shall be capable of withstanding a thrust force caused by a 250 psi dead end load from either direction on that size pipe. Wall pipes shall be furnished uncoated on the outside and cement lined on the inside. Unless specified or shown otherwise, wall pipes shall be flange end types.
- b. Wall pipes shall be cast and/or fabricated and lined in one manufacturer's facilities and delivered to the job site ready for use.

## 2.02 REINFORCED CONCRETE PIPE (RCP)

A. Pipe:

1. Pipe shall be bell and spigot reinforced concrete conforming to ASTM C 76 for Class III, IV and V pipe as shown on the Drawings.



2. In addition, the pipe and materials shall meet the following requirements:
    - a. Concrete shall have a minimum compressive strength of 5,000 psi for Class III and IV and 6,000 psi for Class V
    - b. Cement shall meet the requirements of ASTM C 150, Type II
    - c. Absorption shall not exceed six percent when tested in accordance with ASTM C 497.
  3. Reinforced concrete pipe shall be supplied in lengths of at least eight feet, except for specials.
- B. Joints: Pipe shall have concrete and rubber O-ring gasket type joints conforming to ASTM C 361. A rectangular groove shall be supplied in the spigot end to receive the rubber O-ring gasket, and it shall be so formed that when the joint is complete the gasket will be deformed to a rectangular shape and confined on all four sides. Bell and spigot surfaces shall be accurately formed and smooth to provide a close sliding fit with a nominal clearance of 1/16-inch.
- C. Fittings and Specials: Reinforced concrete pipe fittings and specials shall meet all requirements for reinforced concrete pipe, including materials of construction, structural strength, linings, and joints. Provide special adapters or transition pieces for connection to pipe of different materials where shown on the Drawings.
- D. Acceptance:
1. Acceptance of pipe shall be based on plant load-bearing tests for the load to produce 0.01-inch crack, material tests, and inspection of manufactured pipe for visual defects and imperfections as described in Paragraph 5.1.1 of ASTM C 76.
  2. Provide results of tests on pipe, pipe materials, joint material, and made-up joints performed by an independent testing laboratory approved by the Engineer. Include materials, absorption, crushing, and hydrostatic leakage tests on pipe of each size in accordance with applicable specifications.
  3. Each length of pipe shall be stamped by a regular employee of the approved testing laboratory.

4. Inspect pipe after delivery for laboratory stamp, shape, cracks, uniformity, blisters and imperfect surfaces, hammer test, damaged ends, and gasket grooves. Do not accept or use pipe with repaired or patched gasket grooves or shoulders. Any pipe repaired or patched is subject to rejection if such repairs or patches, in the opinion of the Engineer or City, are not sound and properly finished.
5. The City shall, at its own discretion, select another independent testing laboratory to confirm those tests performed by the manufacturer's testing laboratory. This testing laboratory shall observe the tests conducted by the laboratory selected by the manufacturer, or, as necessary, conduct its own tests. The manufacturer shall provide the necessary facilities for the performance of these tests at the plant site. These test specimens shall be provided in accordance with paragraph 11 of ASTM C 76.
6. No pipe shall be shipped before it has been cured for a minimum of 14 days.

## 2.03 POLYVINYL CHLORIDE (PVC) GRAVITY SEWER PIPE

- A. Acceptability of PVC pipe for gravity sewers is indicated in the following table:

Standard Minimum Thickness Type PVC <sup>1</sup>	Wall	Acceptable Manufacturers	≤ 6	8 to 15	18	21	24
ASTM D 3034 SDR 35 12454B	Solid Wall	Open	Yes	Yes	No	No	No

<sup>1</sup> As specified in ASTM D 1784

- B. All pipes shall have a minimum pipe stiffness of 46 psi at five percent deflection as determined by ASTM D 2412.
- C. PVC gravity sewer pipe shall be supplied in lengths not longer than 13 feet.
- D. Fittings:
1. Fittings 15 inches in diameter and less shall be manufactured in accordance with ASTM D 3034. PVC compound shall be 12454B or 12454C as specified in ASTM D 1784.

2. For sizes 8-inches and less in diameter, fittings shall be molded in one-piece with no solvent welded joints. Minimum socket depths shall be as specified in ASTM D 3034, Table 2.
  3. For sizes 10-inches and larger in diameter, fittings shall be fabricated from pipe conforming to ASTM D 3034 using solvent welding. No field fabrication of fittings will be allowed. All such fabrication shall be performed at the factory and the fittings shall be delivered ready for use.
  4. 4-inch and 6-inch cleanout piping assembly shall be constructed with by connecting the cleanout branch to the lateral with a 2-way, smooth flowing sanitary cleanout tee to facilitate the insertion of a sewer snake or exploratory flexi-cameras for either direction. The 2-way cleanout fitting shall be manufactured with gasketed hub connections. Solvent weld connections will not be allowed. Acceptable manufacturers are those equal to Plastic Trends, Inc. Part No. G1006.
  5. Fittings 18 inches in diameter and larger shall be fabricated from pipe conforming to ASTM F 679 using solvent welding. No field fabrication of fittings will be allowed. All such fabrication shall be performed at the factory and the fittings shall be delivered ready for use.
- E. Joints: Joints for pipe and fittings shall be of the integral bell and spigot type with a confined elastomeric gasket having the capability of absorbing expansion and contraction without leakage, when tested in accordance with ASTM D 3212. Gaskets shall meet the requirements of ASTM F 477. The joint system shall be subject to the approval of the Engineer and shall be identical for pipe and fittings.
- F. Manhole Connections - Solid Wall Pipe: The sewer shall be connected to manholes utilizing a boot connection.
- G. Acceptance: Acceptance will be based on the Engineer's inspection and the manufacturer's written certification that the pipe and fittings were manufactured and tested in accordance with the applicable standards.

## 2.04 HDPE PIPE

- A. The pipe supplied under this specification shall be high performance, high molecular weight, high-density polyethylene pipe equal to Driscopex as manufactured by Chevron Phillips Chemical Company or Camcore™ as manufactured by WL Plastics Corporation. The pipe material shall be Type III, Class C, Category 5, P34 material as described in ASTM D 1248.

Minimum cell classification values of the pipe material shall be (3 4 5 4 3 4 c) as referenced in ATSM D 3350. The SDR shall be 17. The fittings supplied under this specification shall be molded from a polyethylene compound having a cell classification equal to or exceeding the cell classification of the pipe supplied under this specification.

B. Physical Properties of Pipe of Pipe Compound:

1. Density: The density shall be 0.941 – 0.957 gms/cm when tested in accordance with ASTM D 1505.
2. Melt Flow: Melt Flow shall be no greater than 0.11 gm/10 min. When tested in accordance with ASTM D 1238 – Condition E.
3. Flex Modulus: Flexural Modulus shall be 110,000 psi to less than 160,000 psi when tested in accordance with ASTM D 790.
4. Tensile Strength at Yield: Tensile strength at yield shall be 3,200 PSI to less than 3,500 PSI when tested in accordance with ASTM D638.
5. ESCR: Environmental Stress Crack Resistance shall be in excess of 5,000 hours with zero failures when tested in accordance with ASTM D 1693 Condition C.
6. Hydrostatic Design: Basic shall be 1,600 psi at 23-C when tested in accordance with ASTM D 2837.

C. Deviations: If a supplier chooses to submit a bid that does not meet all the requirements of this specification, his bid shall include a written description of the deviation with data that shows the magnitude of the deviation and the justification for the deviation from this specification. The decision to accept material deviating from this specification shall be the responsibility of the specifying engineer.

D. Certification: The City or the specifying engineer may request certified lab data to verify the physical properties of the materials supplied under this specification or may take random samples and have them tested by an independent laboratory.

E. Rejection: Polyethylene pipe and fittings may be rejected for failure to meet any of the requirements of this specification.

F. Pipe Dimensions: Pipe supplied under this specification may be iron pipe size (IPS) or ductile iron pipe size (DIPS) as produced by the manufacturer. IPS or DIPS nominal pipe sizes equal to the pipe

dimension shown on the Drawings shall be provided for all pipe sizes equal to or less than 12 inches. IPS or DIPS actual inside diameter shall be provided which is equal to or greater than the pipe dimension shown on the Drawings for all pipe sizes greater than 12 inches. The SDR (Standard Dimension Ratio) of the pipe supplied shall be as specified by the Engineer.

- G. Color: Material color shall be light gray. Light gray interior color of pipe shall allow easier/better viewing for television inspection.
- H. Anti-flotation Measures: Where ground cover for HDPE pipe is less than four feet (4 ft), ant flotation devices are to be installed in order to overcome potential uplifting forces from groundwater. These devices may include, but are not limited to, precast concrete saddles, gravel-filled saddle bag pipeline weights, or cast-in-place anti-flotation collars (per Detail 21 on the Drawings). Wherever such a device is to be installed, the Contractor shall be responsible for performing the necessary calculations to ensure that the pipe will not float AND that the pipe and/or ant flotation device will not be overstressed. The pipe manufacturer's allowable shear stress, compressive stress due to buckling and thermal expansion shall be considered in the calculations. Minimum factor of safety against flotation is 1.5. These calculations shall be submitted with shop drawings for anti-flotation devices when such devices are required.

## 2.05 HDPE MANHOLES

- A. Material: The material used under this specification shall be high performance, high molecular weight, high density polyethylene plastic compound having a cell classification of 334433C or higher. The material must have a proven capacity for sustaining long term stresses (radial loading, ring compressive thrust, bending, buckling, axial strain, axial buckling, and groundwater effects) as quantified under ASTM Test Method D2837 or other applicable testing procedures under ASTM.
- B. Appurtenances:
  - 1. Polyethylene Manhole Covers: Polyethylene flat-plate covers shall be designed to withstand light live-loads, such as light equipment and personnel. All manhole covers shall prove to meet this requirement through either physical testing or design calculations. If subject to repeated vehicular loading, the cover should be capped or cast in concrete.
  - 2. Risers: All riser sections shall be joined by thermal fusion or gasket joints. Where risers are joined by a gasket joint, the joints must meet the requirements of Specification D 3212.

3. Cones: Where gasket joints are required to seal the connection between a manhole cone or top, the gasket joint shall prove to provide an adequate seal against the maximum water-head expected for the joint in question.
4. Antiflotation Devices: Where manhole risers extend below the groundwater level, antiflotation devices are to be installed in order to overcome any foreseen uplifting forces. These devices may include, but are not limited to, anchoring to a concrete slab, or attaching a concrete ring to the base or riser. Wherever such a device is to be installed, the Contractor shall be responsible to perform the necessary calculations to ensure that both the manhole will not float AND that the antiflotation device will not be overstressed. These calculations shall be included with the shop drawing submittals.
5. Pipe Connection: Each HDPE manhole will have a stub for all pipes entering and leaving the chamber. The Contractor shall supply under this section all necessary connections, couplings, etc., to join adjacent pipe to HDPE stub pipe.

## **2.06 PRECAST CONCRETE MANHOLES AND PRODUCTS**

### **A. Precast Concrete Sections:**

1. Precast concrete sections shall meet the requirements of ASTM C 478 or ASTM C 913. The minimum compressive strength of the concrete in precast sections shall be 4,000 psi.
2. Wall thickness shall be as shown on the Drawings.
3. Transition slabs or cones that convert bases larger than four feet in diameter to four foot diameter risers shall be designed by the manhole manufacturer to carry the live and dead loads exerted on the slab.
4. Seal joints between precast sections by means of rubber O-ring gaskets or flexible butyl rubber sealant. Butyl rubber sealants shall meet the requirements of AASHTO M-198. Sealant shall be pre-formed type with a minimum nominal diameter of 1-inch. Butyl rubber sealant shall be equal to Kent Seal No. 2 or Concrete Sealants CS202.
5. Each section of the precast manhole shall have not more than two (2) holes for the purpose of handling and laying. These holes shall

be tapered and shall be plugged with rubber stoppers or mortar after installation.

6. Polypropylene plastic manhole steps shall be installed in each section of the manhole in accordance with the City of Atlanta standard details.

- B. Brick and Mortar: Brick shall be whole and hardburned, conforming to ASTM C 32 Grade MS. Mortar shall be made of one part Portland cement and two parts clean sharp sand. Cement shall be Type 1 and shall conform to ASTM C 150. Sand shall meet ASTM C 144.
- C. Foundations: A prepared foundation shall be placed for all brick structures after the foundation excavation is completed and accepted. Unless otherwise specified, the base shall consist of reinforced concrete mixed, prepared, and placed in accordance with the requirements of Section 03300. The foundation shall be built to the correct elevation and shall be finished to cause the least possible resistance to flowing water.
- D. Laying Brick: All brick shall be clean and thoroughly wet before laying so that they will not absorb any appreciable amount of additional water at the time they are laid. All brick shall be laid in freshly made mortar. Mortar that is not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted. An ample layer of mortar shall be spread on the beds and a shallow furrow shall be made in it, which can be readily closed by the laying of the brick. All bed and head joints shall be filled solid with mortar. End joints of stretchers and side or cross joints of headers shall be fully buttered with mortar and a shoved joint made to squeeze out mortar at the top of the joint. Any bricks that may be loosened after the mortar has taken its set shall be removed, cleaned, and relaid with fresh mortar. No broken or chipped brick shall be used in the face, and no spalls or bats shall be used except where necessary to shape around irregular openings or edges; in which case, full bricks shall be placed at ends or corners where possible, and the bats shall be used in the interior of the course. In making closures, no piece of brick shorter than the width of a whole brick shall be used; and wherever practicable, whole brick shall be used and laid as headers.
- E. Joints: All joints shall be slushed with mortar at every course, but slushing alone will not be considered adequate for making an acceptable joint. Exterior faces shall be laid up in advance of backing. Exterior faces shall be back plastered or pargeted with a coat of mortar not less than ½ -inch thick before the backing is laid up. Prior to pargeting, all joints on the back of face courses shall be cut flush. Unless otherwise noted, joints shall be

not less than ¼-inch or more than ½-inch wide and whatever width is adopted shall be maintained uniform throughout the work.

- F. Pointing: Face joints shall be neatly struck, using the weather joint. All joints shall be finished properly as the laying of the brick progresses. When nails or line pins are used, the holes shall be immediately plugged with mortar and pointed when the nail or pin is removed.
- G. Cleaning: Upon completion of the work, all exterior surfaces shall be thoroughly cleaned by scrubbing and washing down with water and, if necessary to produce satisfactory results, cleaning shall be done with a 5 percent solution of muriatic acid, which shall then be rinsed off with liberal quantities of clean fresh water.
- H. Curing and cold weather protection: In hot or dry weather, the brick masonry shall be protected and kept moist for at least 48 hours after laying the brick. Brick masonry work or pointing shall not be done when there is frost in the brick or when the air temperature is below 50 degrees F, unless the Contractor has on the project, ready to use, suitable covering and an artificial heating devices necessary to keep the atmosphere surrounding the masonry at a temperature of not less than 60 degrees F for the duration of the curing period.
- I. Iron Castings:
  - 1. Cast iron manhole frames and covers shall meet the requirements of ASTM A 48 for Class 30 gray iron and all applicable local standards. All castings shall be tough, close grained, smooth, and free from blow holes, blisters, shrinkage, strains, cracks, cold shots and other imperfections. No casting will be accepted which weighs less than 95 percent of the design weight. Shop drawings must indicate the design weight and provide sufficient dimensions to permit checking.
  - 2. Manhole frames and covers shall be as shown on the Standard Details.
  - 3. All frames and covers shall have machined horizontal bearing surfaces.
  - 4. All manholes shall have standard frames and covers except where specifically shown otherwise on the Drawings.
  - 5. Watertight covers shall be bolt-down type and shall be equipped with four 1/2-inch stainless steel bolts and a 1/8-inch red rubber or rubber O-ring gasket. Covers shall be rotatable and interchangeable. Bolt holes shall be bored through so that debris entering the bolt hole will



fall into the manhole. Bolt holes shall have the full 360 degree circle within the cover's radius when bored through the cover.

- J. Boots: Provide preformed rubber boots and fasteners equal to those manufactured by Kor-N-Seal or Press Seal Gasket Corporation. Boots may be mechanically attached to the manhole or cast into the walls of the manhole.

## 2.07 MISCELLANEOUS

A. Flexible Adapter Couplings:

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

B. Inside Drop Connections:

1. Where a sewer entering an existing manhole is more than 24-inches above the manhole invert, an inside drop inlet shall be constructed to lower the inlet elevation of the sewer to coincide with the invert elevation of the manhole. If required, the manhole invert and bench shall be re-built in conjunction with the installation of the drop connection to ensure a smooth flow path for the incoming sewer drop. The inside drop connection shall be field fabricated with Schedule 80 PVC fittings and piping, or may be shop fabricated with different materials by a specialty manufacturer subject to approval by the Engineer (e.g. molded polyethylene inside drop inlet by GU International). The top fitting of the inside drop connection shall be a tee fitting or a 90-degree bend with a clean out attachment at the opposite end of the incoming flow opening (to facilitate future sewer inspection and/or cleaning). The bottom fitting of the drop shall be a 90-degree bend into the manhole invert, or a plain end may be used where a concrete fillet is constructed to transition flow from the plain end into the manhole invert. All pipe to manhole connections must conform to ASTM C923. Anchor straps and bolts shall be 304 stainless steel, minimum, with 4 vertical feet maximum spacing (2 straps minimum).

C. Chemical Root Treatment:

1. Chemical Root treatment shall be utilized where indicated to kill invasive roots and to prevent root re-growth in small diameter sewers. Chemical treatment shall be non-carcinogenic, herbicidal type and applied by professional applicator personnel licensed by the Georgia Department of Agriculture. The applicator shall have a minimum of one year experience and having successfully treated a minimum of one hundred thousand lineal feet of sewer main piping in the continental United States of America.
2. Preconditioning or cleaning of the sewer main shall not be required before or after application of chemical root control unless specifically indicated by the Engineer (e.g. to remove large blockages or debris, which may be surcharging the sewer). Root masses do not generally require cutting by mechanical means prior to application of chemical root treatment and shall not be performed unless directed by the Engineer. In such an event, the contractor shall coordinate root cutting with application of the chemical root treatment in accordance with the manufacturer recommendations to meet the desired level of performance stated below.
3. Each treatment application shall progress from the downstream manhole (whenever practical) at such a rate and pressure so as to provide full chemical contact of the entire interior surface of the sewer main while providing penetration of all piping joints, cracks, holes and service connections. The retention time and concentration of the chemical shall be sufficient to kill all roots in the sewer and prevent root re-growth for a period of two years after the application. If re-growth is evident prior to expiration of the aforementioned two-year period, the Contractor shall provide additional chemical root treatment to the satisfaction of the City at no additional cost.
4. Acceptable products are diquat based herbicides equal to those manufactured by Dukes Root Control, Inc.

## **PART 3 – EXECUTION**

### **3.01 EXISTING UTILITIES AND OBSTRUCTIONS**

- A. The Contractor shall call the Utilities Protection Center (UPC) (1-800-282-7411) as required by Georgia law (O.C.G.A. §§25-9-1 through 25-9-13) and all utilities, agencies or departments that own and/or operate utilities in the vicinity of the construction work site, at least 72 hours (three business days) prior to construction, to verify the location of the existing utilities.
- B. Existing Utility Location: The following steps shall be exercised to avoid interruption of existing utility service.
  1. Provide the required notice to the utility owners and allow them to locate their facilities according to Georgia law. Field utility locations are valid for only ten days after original notice. The Contractor shall ensure, at the time of any excavation that a valid utility location exists at the point of excavation.
  2. Expose the facility to verify its true location and grade for a distance of at least 200 feet in advance of pipeline construction to verify its true location and grade. Repair, or have repaired, any damage to utilities resulting from locating or exposing their true location.
  3. Avoid utility damage and interruption by protecting it with means or methods recommended by the utility owner.
  4. Maintain a log identifying when phone calls were made, who was called, area for which utility relocation was requested and work order number issued, if any. The Contractor shall provide the Engineer an updated copy of the log bi-weekly, or more frequently if required.
- C. Conflict with Existing Utilities:
  1. Horizontal Conflict: Horizontal conflict shall be defined as when the actual horizontal separation between a utility, main, or service and the proposed water main does not permit safe installation of the sewer by the use of sheeting, shoring, tying-back, supporting, or temporarily suspending service of the parallel or crossing facility. The Contractor may change the proposed alignment of the sewer to avoid horizontal conflicts if the new alignment remains within the available right-of-way or easement and complies with regulatory agency requirements after a written request to and subsequent approval by the Engineer. Where the Engineer does not approve such relocation of the sewer, the Contractor shall arrange to have the utility, main, or service relocated.

2. Vertical Conflict: Vertical conflict shall be defined as when the actual vertical separation between a utility, main, or service and the proposed sewer does not permit the crossing without immediate or potential future damage to the utility, main, service, or the sewer. The Contractor may change the proposed grade of the sewer to avoid vertical conflicts if the changed grade provides minimum required capacity, maintains adequate cover and complies with regulatory agencies requirements, after written request to and subsequent approval by the Engineer. Where the Engineer does not approve such relocation of the sewer, the Contractor shall arrange to have the utility, main, or service relocated.
- D. Electronic Locator: Have available at all times an electronic pipe locator and a magnetic locator, in good working order, to aid in locating existing pipe lines or other obstructions.
- E. Water and Sewer Separation:
  1. Sewers should maintain a minimum 10-foot edge-to-edge separation from water mains. Where the sewer crosses a water main, an 18-inch vertical separation shall be maintained where possible. Where possible, a full joint of sewer pipe shall be centered over the water main. Any deviation shall be requested in writing to the Engineer.
  2. No water main shall be permitted to pass through or come in contact with any part of a manhole.
- F. Installation: The covers of all manholes shall be at least 30" above grade after installation, except in grassed/landscaped or paved areas. After completion of the manhole survey, the contractor shall submit finish grades of all manhole covers and submit with shop drawings.
- G. Rock Excavation: When rock is encountered in trenches, it shall be removed to a depth of at least six inches (6") below the pipe bell, and a width of three inches (3") on each side of the pipe bell, except for a minimum required trench width of twenty-four inches (24"). Refer to Section 02200 for rock classification and measurement.

### **3.02 CONSTRUCTION ALONG HIGHWAYS, STREETS AND ROADWAYS**

- A. Refer to Specifications Section 01500 – Construction Facilities and Temporary Controls for requirements

### **3.03 PIPE DISTRIBUTION**

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

### **3.04 LOCATION AND GRADE**

- A. The slope shown on a pipeline profile and/or called for in the Specifications is the slope of the invert of the pipe.
- B. Prior to clearing and grubbing, construction staking shall be performed.
- C. Construction shall begin at the low end of the sewer and proceed upstream without interruption. Multiple construction sites shall not be permitted without written authorization from the Engineer for each site. At a minimum, cut sheets between construction sites shall be submitted and approved before multiple construction sites will be permitted.
- D. The Contractor shall be responsible for any damage done to reference points, base lines, center lines and temporary bench marks, and shall be responsible for the cost of re-establishment of reference points, base lines, center lines and temporary bench marks as a result of the operations.

### **3.05 LAYING AND JOINTING PIPE AND ACCESSORIES**

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

1. Proper implements, tools and facilities shall be provided for the safe performance of the Work. All pipe, fittings and valves shall be lowered carefully into the trench by means of slings, ropes or other suitable tools or equipment in such a manner as to prevent damage to sewer materials and protective coatings and linings. Under no circumstances shall sewer materials be dropped or dumped into the trench.
2. All pipe, fittings and appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the Engineer, who may prescribe corrective repairs or reject the materials.
3. All lumps, blisters and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and free from dirt, sand, grit or any foreign materials before the pipe is laid. No pipe that contains dirt shall be laid.
4. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing or other materials shall be placed in the pipe at any time.
5. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.
6. It is common practice to lay pipe with the bells facing the direction in which work is progressing; however, it is not mandatory.
7. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade shall not be permitted.
8. Polyethylene Encasement: For Ductile Iron Pipe, installation of encasement, when directed by the Engineer, shall be in accordance with AWWA C105 and the manufacturer's instructions. All ends shall be securely closed with tape and all damaged areas shall be completely repaired to the satisfaction of the Engineer.

C. Alignment and Gradient:

1. Lay pipe straight in alignment and gradient or follow true curves, where shown on the Drawings, as nearly as practicable. Do not

deflect any joint more than the maximum deflection recommended by the manufacturer.

2. Maintain a transit, level and accessories on the job to lie out angles and ensure that deflection allowances are not exceeded.
3. The Contractor shall check the invert elevation at each manhole and the pipe invert elevation at each bell in open cut areas of pipe installation
4. The Contractor shall check the horizontal alignment of the sewer and ground surface elevations at the same schedule as for invert elevations.

D. Expediting of Work: Excavate, lay the pipe, and backfill as closely together as possible, as determined by the Engineer. Do not leave unjointed pipe in the trench overnight. Backfill and compact the trench as soon as possible after laying and jointing is completed. Cover the exposed end of the installed pipe each day at the close of work and at all other times when work is not in progress. If necessary to backfill over the end of an uncompleted pipe or accessory, close the end with a suitable plug, either push-on, mechanical joint, restrained joint or as approved by the Engineer.

E. Joint Assembly:

1. Joints shall be assembled in accordance with the manufacturer's recommendations.
2. The Contractor shall internally inspect each pipe joint to insure proper assembly for pipe 30-inches in diameter and larger after the pipe has been brought to final alignment.
3. On reinforced concrete pipe, diameters 30-inches and larger, the Contractor shall fill the voids, on the pipe joint interior, with grout.

F. Cutting Pipe:

1. Cut ductile iron pipe using an abrasive wheel saw.
2. Cut PVC/HDPE pipe using a suitable saw.
3. Remove all burrs and smooth the end before jointing.
4. The Contractor shall cut DIP pipe and bevel the end, as necessary, to provide the correct length of pipe necessary for installing the fittings, valves, accessories and closure pieces in the correct

location. Only push-on or mechanical joint pipe shall be cut. Plastic and HDPE Pipe shall be cut precisely square.

### 3.06 SEWER SERVICE CONNECTIONS

- A. All sewer service connections shall be identified and located prior to pipe installation or replacement. The complete list of service laterals; included relevant footage and diameter of lateral shall be submitted prior to pipe installation or replacement to the Engineer for information. Upon commencement, pipe installation or replacement shall be continuous and without interruption from one manhole to another, except as approved by the Engineer and/or Engineer representative.
- B. After installation or replacement of mainline sewer is complete, but prior to service reconnects, perform a CCTV inspection with a hand held ("Push") CCTV camera of all service laterals to the edge of right-of-way (ROW) or edge of easement, or as far as is feasible based on configuration or defects of laterals. The inspection shall be performed in the presence of the Engineer and/or Engineer representative. If the Engineer determines that a lateral requires replacement, the service lateral shall be replaced complete from the mainline sewer to the edge of ROW or edge of easement. If directed to do so by the Engineer, install a two-way cleanout at the edge of ROW or easement. The cleanout shall incorporate all appropriate and necessary couplings for a watertight connection to the service lateral piping.
- C. Upon completion of installation of the new mainline sewer pipe, the Contractor shall complete the reconnection of all service laterals on the segment within 24-hours to minimize inconvenience to sewer customers. Exceptions to this requirement apply only to service laterals that will be replaced from the mainline sewer to the edge of ROW or easement. In these cases, services shall be reconnected within a time frame specified by the Engineer at the work site.
- D. All service connections shall be made by core drilling a circular hole through the wall of the existing pipe. The hole size shall be equal to the inside diameter of the connecting piping, free of burrs or rough edges and perpendicular to the existing pipe. Installation of the saddle assembly shall be in accordance with the saddle manufacturer's recommendations and provide a watertight seal. Pipe branch connection products shall correspond to the sewer main pipe material as indicated below:

Sewer Main Material	Branch Connection Product
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Ductile Iron ***	Sewer saddle equal to CB Sewer Saddle manufactured by Romac Industries.
Concrete	Sewer saddle equal to CB Sewer Saddle manufactured by Romac Industries.
Vitrified Clay ***	Sewer saddle equal to CB Sewer Saddle manufactured by Romac Industries.
PVC ***	Flexible type saddle equal to Fernco Flexible Tap Saddle.
HDPE	Flexible type saddle equal to Fernco Flexible Tap Saddle or electrofusion saddle equal to Central Plastics Company Electrofusion Branch Saddle.

\*\*\* Wye or Tee fittings shall be used in lieu of the products indicated above if the sewer main piping is installed using open cut trench methods.

- E. Connections to the existing sewer house connection pipe shall be made using sleeved stainless steel flexible couplings. All flexible couplings shall conform to ASTM C 425 and shall be equal to those manufactured by Fernco Inc., DFW Plastics, Inc., or Mission Rubber Company.
- F. In the event a lined pipe is encountered, the host pipe (outer) pipe material shall be used to determine the branch connection product as indicated above.
- G. The slope of the existing service connection (lateral) toward the new pipe shall be maintained at the existing percent slope. Reconstructed service laterals shall be installed at a minimum slope of one percent (1%) or as specified by the Engineer.
- H. For Supplemental Work Not Shown on Plans or Other Work Tables, the work item term "Rehab Lateral" shall refer to the following process:
  - 1. The contractor shall locate the structure in the field and perform a CCTV inspection in accordance with Section 02752 Internal Sewer Condition Assessment. This item shall be paid under bid item Sewer, Internal Pipe Inspection, Service Lateral, 4" to 6" Diameter - Bid Item 4-I-6010.
  - 2. The contractor shall review the results of the CCTV inspection with the Engineer and determine the appropriate rehabilitation method, then prosecute the rehabilitation work.

### 3.07 CONSTRUCTION PRACTICES FOR POLYETHYLENE PIPE

- A. Handling of Pipe: Pipe shall be stored on clean, level ground to prevent undue scratching or gouging of the pipe. If the pipe must be stacked for storage, such stacking should be in accordance with the pipe manufacturer's recommendations. The pipe should be handled in such manner that it is not damaged by being dragged over sharp objects or cut by chokers or lifting equipment.
- B. Repair of Damaged Sections: Segments of pipe having cuts or gouges in excess of 10% of the wall thickness of the pipe shall be cut out and removed. The undamaged portions of the pipe shall be rejoined using the butt fusion joining method.
- C. Pipe Joining: Sections of polyethylene pipe should be joined into continuous lengths on the job site above ground. The joining method shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedure shall be capable of meeting all conditions recommended by the pipe temperature, alignment, and fusion pressure.
- D. Handling of Fused Pipe: Fused segments of pipe shall be handled so as to avoid damage to the pipe. When lining fused sections of pipe, chains or cable-type chokers should be avoided. Nylon slings are preferred. Care should be exercised to avoid cutting or gouging the pipe.
- E. Trenching and Backfill: All trenching and backfill shall be in accordance with Section 02200 and standard details on the Drawings and as indicated below:
  - 1. Trench Construction: The trench and trench bottom should be constructed in accordance with ASTM D 2321 – Section 7.
  - 2. Embedment Material: Embedment materials should be Class I, Class II, or Class III materials as defined in ASTM D 2321 – Section 6. The use of Class IV and/or Class V materials for embedment are not recommended and should be allowed only with the approval of the engineer.
  - 3. Bedding: Bedding of the pipe should be performed in accordance with ASTM D 2321 –Section 8. Compaction should be specified in ASTM D 2321. Deviation from the specified compaction shall be approved by the engineer.
  - 4. Haunching and Initial Backfill: Haunching and initial backfill should be as specified in ASTM D 2321- Section 9 using Class I, Class II, or Class III materials. Materials used and compaction shall be as specified by the engineer. Compaction 85% Standard Proctor

Density must be maintained in unpaved areas. Paved areas will require a higher level of compaction in accordance with the pavement design criteria.

5. Special Conditions: ASTM D 2321 – Section 11.2, Minimum Cover for Load Application, Section 11.3, Use of Compaction Equipment and Section 11.4, Removal of Trench Protection, should apply unless directed otherwise by the engineer.

### 3.08 MANHOLE AND PRECAST CONCRETE PRODUCT CONSTRUCTION

- A. Construct manholes as shown on the Drawings.
- B. Precast Concrete: Handle sections carefully to prevent cracking or chipping. Provide uniform bedding of the bottom section to prevent uneven loading. Install gaskets and joint sealants in accordance with manufacturer's recommendations to produce a watertight structure.
- C. Brick: Bed the bottom and sides of every brick in mortar. Apply a smooth coat of mortar, 3/4-inch thick, on the inside and outside.
- D. Pipe Connections: Seal the connection between the pipe and the manhole as follows:
  1. Pipe 36-Inch Diameter and Less: Connect pipe to manhole utilizing rubber boots.
  2. If rubber boots are damaged, replace Type I boots with a new boot and repair Type II boots by constructing a manhole collar.
  3. If preformed openings must be enlarged or altered, or if new openings must be made in the field, minimize the amount of material removed to provide closely matched surfaces for grouting.
- E. Inverts: Form channels as shown on the Drawings, rounded, and troweled smooth with brick faces exposed. Maintain consistent grade through the invert.
- F. Top Elevations: Build manholes outside of paved areas to 30-inches above finished grade, unless otherwise shown on the Drawings or directed by the Engineer. Build manholes in paved areas to existing grades.

- G. Drop Connections: Replace existing manholes that contain drop connections, where required, with a similar drop connection. Construct drop connections of the same materials as the upstream sewer and in accordance with the details shown on the Drawings.
- H. Frames and Covers: Unless frame and cover is at grade, the frame shall be cast into the cone section. Covers shall be solid, cast-iron, without ventilation holes.
- I. Seal all manhole joints and lift holes, both inside and out, with grout. Between precast sections, this is in addition to joint sealant.

### 3.09 CONCRETE ENCASEMENT

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

### 3.10 INSPECTION AND TESTING

- A. Clean and test lines before requesting final acceptance. Where any obstruction is met, clean the sewers by means of rods, swabs, or other instruments. When requested by the Engineer, flush out lines and manholes before final inspection. The costs for inspection and testing shall be included in the unit prices for pipe replacement and point repairs.
- B. Alignment: Pipe lines shall be straight and show a uniform grade between manholes. Correct any discrepancies discovered during inspection.
- C. Watertightness: A watertightness test shall be performed on all new sewers constructed and lined sewers (prior to cutting the liner to reinstate lateral connections) as indicated below. All visible leaks, including those found via television inspection, shall be repaired.
  - 1. Low-Pressure Air Test: Sewer diameters less than or equal to 24-inches.
    - a. Prior to air testing, the section of sewer between manholes shall be thoroughly cleaned and wetted. Immediately after cleaning or while the pipe is water soaked, the sewer shall be

tested with low-pressure air. At the Contractor's option, sewers may be tested in lengths between manholes or in short sections (25 feet or less) using inflatable balls pulled through the line from manhole to manhole. Air shall be slowly supplied to the plugged sewer section until internal air pressure reaches approximately 4.3 psi. After this pressure is reached and the pressure allowed to stabilize (approximately two to five minutes), the pressure may be reduced to 3.5 psi before starting the test. If a 1.0 psi drop does not occur within the test time, then the line has passed the test. If the pressure drops more than 1.0 psi during the test time, the line is presumed to have failed the test, and the Contractor will be required to locate the failure, make necessary repairs, and retest the line. Minimum test time for various pipe sizes and types is as follows:

Nominal Pipe Size, inches	Time (Min/100 feet)	
	VCP, RCP	DIP, PVC, HDPE
6	0.7	5.7
8	1.2	7.6
10	1.5	9.4
12	1.8	11.3
15	2.1	14.2
18	2.4	17.0
21	3.0	19.8
24	3.6	22.8

- b. Required test equipment, including inflatable balls, braces, air hose, air source, timer, rotameter as applicable, cut-off valves, pressure reducing valve, 0-15 psi pressure gauge, 0-5 psi pressure gauge with gradations in 0.1 psi and accuracy of + two percent, shall be provided by the Contractor. Testing equipment shall be equal to Cherne Air-Loc Testing Systems.
- c. The Contractor shall keep records of all tests made. Copy of such records will be given to the Engineer or the City. Such records shall show date, line number and stations, operator, and such other pertinent information as required by the Engineer.
- d. The Contractor is cautioned to observe proper safety precautions in performance of the air testing. It is imperative that plugs be properly secured and that care be exercised in

their removal. Every precaution shall be taken to avoid the possibility of over-pressurizing the sewer line.

D. Deflection Test:

1. All PVC pipe gravity sewers.

- a. Test PVC and gravity sewer for excessive deflection by passing a mandrel through the pipe. Deflection of the pipe shall not exceed ten percent.
- b. The mandrel size shall be based upon the maximum possible inside diameter for the type of pipe being tested, taking into account the allowable manufacturing tolerances of the pipe. The mandrel shall have an odd number of legs, or vanes, with a quantity of such equal to or greater than nine. The legs of the mandrel shall be permanently attached to the mandrel. A mandrel with variable sizes shall not be allowed. The mandrel shall be constructed of steel, aluminum or other material approved by the Engineer, and shall have sufficient rigidity so the legs of the mandrel will not deform when pulling through a pipe. The mandrel dimensions shall be checked by the Engineer before use by the Contractor.
- c. Excavate and install properly any section of pipe not passing the test. Re-test until results are satisfactory.
- d. The test shall be performed twice:
  - 1) Once within the first 30 days of installation
  - 2) Once during final inspection, but no sooner than 30 days after pavement backfill done, at the completion of this contract.

E. Closed Circuit Television: The interior of the gravity sewers shall be subjected to a televised inspection. The audio/video shall provide an audio description of what is being viewed; provide a continuous running footage indicator between manholes; and be prepared in the presence of the City's representative. Prior to Final Acceptance, the City shall be provided with one copy of the TV inspection report and video showing the entire length of gravity sewer being tested. The report shall contain the condition of pipe, type of pipe, depth, location of services, length, type

joint, roundness, and distance between manholes. Any pipe found to be cracked, leaking, misaligned, bellied or otherwise defective shall be removed and replaced. CCTV inspection shall conform to the requirements of Section 02752. The post-installation CCTV inspection shall take place as shortly after completion of each section as is feasible, but in no case more than ten (10) calendar days thereafter. The contractor is required to submit the post-installation CCTV videos within ten (10) calendar days of completing the rehabilitation of a segment of the sewer.

All costs associated with the CCTV inspection shall be considered incidental to the pipe installation work and shall be included in the unit prices.

**F. Manholes:**

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

<b>MINIMUM TEST TIMES FOR VARIOUS MANHOLE DIAMETERS AND DEPTHS</b>			
<b><i>Depth (feet)</i></b>	<b>Minimum Test Times with a 4 ft. Diameter</b>	<b>Minimum Test Times with a 5 ft. Diameter</b>	<b>Minimum Test Times with a 6 ft. Diameter</b>
8	20	28	33
10	25	33	41
12	30	39	49
14	35	48	57

16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97
26	64	85	105
28	69	91	113
30	74	98	121

### 3.11 PROTECTION AND RESTORATION OF WORK AREA

- A. General: Return all items and all areas disturbed, directly or indirectly by work under these Specifications, to their original condition or better, as quickly as possible after work is started.
1. The Contractor shall plan, coordinate, and prosecute the work such that disruption to personal property and business is held to a practical minimum.
  2. All construction areas abutting lawns and yards of residential or commercial property shall be restored promptly. Backfilling of underground facilities, ditches, and disturbed areas shall be accomplished on a daily basis as work is completed. Finishing, dressing, and grassing shall be accomplished immediately thereafter, as a continuous operation within each area being constructed and with emphasis placed on completing each individual yard or business frontage. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.
  3. Handwork, including raking and smoothing, shall be required to ensure that the removal of roots, sticks, rocks, and other debris is removed in order to provide a neat and pleasing appearance.
  4. The Engineer shall be authorized to stop all work by the Contractor when restoration and cleanup are unsatisfactory and to require appropriate remedial measures.
- B. Man-Made Improvements: Protect, or remove and replace with the Engineer's approval, all fences, walkways, mail boxes, pipe lines, drain culverts, power and telephone lines and cables, property pins and other improvements that may be encountered in the work. Fences crossing the easement shall be gated.
- C. Cultivated Growth: Do not disturb cultivated trees or shrubbery unless approved by the Engineer. Any such trees or shrubbery that must be



removed shall be heeled in and replanted under the direction of an experienced nurseryman.

- D. Cutting of Trees: Do not cut trees for the performance of the work except as absolutely necessary. Protect trees that remain in the vicinity of the work from damage from equipment. Do not store spoil from excavation against the trunks. Remove excavated material stored over the root system of trees within 30 days to allow proper natural watering of the root system. Repair any damaged tree over 3-inches in diameter, not to be removed, under the direction of an experienced nurseryman. All trees and brush that require removal shall be promptly and completely removed from the work area and disposed of by the Contractor. No stumps, woodpiles, or trash piles will be permitted on the work site. The Contractor may chip and grind vegetation and spread over the disturbed area if approved by the City.
- E. Disposal of Rubbish: Dispose of all materials cleared and grubbed during the construction of the project in accordance with the applicable codes and rules of the appropriate City of Atlanta, state and federal regulatory agencies. All debris and rubbish from clearing operations shall be removed from site within one (1) week after cutting.
- F. Swamps and Other Wetlands:
1. The Contractor shall not construct permanent roadbeds, berms, drainage structures or any other structures that alter the original topographic features within the easement.
  2. All temporary construction or alterations to the original topography will incorporate measures to prevent erosion into the surrounding swamp or wetland. All areas within the easement shall be returned to their original topographic condition as soon as possible after work is completed in the area. All materials of construction and other non-native materials shall be disposed by the Contractor.
  3. The Contractor shall provide temporary culverts or other drainage structures, as necessary, to permit the free migration of water between portions of a swamp, wetland or stream that may be temporarily divided by construction.
  4. The Contractor shall not spread, discharge or dump any fuel oil, gasoline, pesticide, or any other pollutant to adjacent swamps or wetlands.

END OF SECTION

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**SECTION 02750**

**Wastewater Flow Control**

**PART 1 – GENERAL**

**1.01 SCOPE**

- A. The objective of flow bypass and/or diversion pumping is to:
1. Maintain an efficient and uninterrupted level of service to wastewater collection system users while maintenance or construction operations (including rehabilitation, repair or replacement) are facilitated on the segment or segments being bypassed and/or from which flow is being diverted, within the wastewater collection system
  2. Ensure all levels of sewage flow are continuously and effectively handled around the segment or segments of sewer being bypassed and/or from which flow is being diverted by:
    - a. Ensuring that bypass and diversion pumps are adequately fueled, lubricated and maintained
    - b. Ensuring backup spare parts are expeditiously applied to the flow bypass and/or diversion pumping system in the event of component breakdown
    - c. Ensure an emergency backup plan is smoothly implemented in the event of system failure
    - d. Preventing backup, spillage, flooding or overflow onto streets, yards and unpaved areas or into buildings, adjacent ditches, storm sewers, and waterways, while flow bypass or diversion pumping takes place and ensure that installation, startup and subsequent disassembly of the flow bypass and diversion pumping system is smoothly transitioned
- B. When pumps are operating, an experienced bypass/diversion pump maintenance operator/mechanic and/or assistant shall continuously be on site to monitor the operation of the entire bypass/diversion system. The operator/mechanic and/or assistant shall comprehensively, methodically and continuously:
1. Adjust pump speed as appropriate so as not to adversely impact upstream or downstream flow condition levels

2. Check that the effectiveness and security of bulkheads, dams, diaphragms, plugs, valves, weirs, and all other flow control devices are working effectively and according to plan
  3. Check the integrity of hoses and couplings along the entire bypass/diversion system
  4. Monitor fuel tanks and refuel as necessary
  5. Monitor lubrication levels and provide additional lubrication as
  6. Facilitate minor repairs as required
  7. Report on potential problems arising
  8. Inspect bypass-pumping system at least hourly to ensure that the system is working correctly.
  9. Maintain adequate supply of spare parts on site as required.
- C. Bypass pumping systems shall include a maximum of 600 lineal feet discharge piping length.

## 1.02 SUBMITTALS

- A. The design, installation, and operation of the temporary pumping system shall be the Contractor's responsibility. The Contractor shall employ the services of a vendor that can demonstrate to the Engineer that the vendor specializes in the design and operation of temporary bypass pumping systems. The vendor shall provide at least three (3) references of projects of a similar size and complexity as this project, which were successfully performed by the vendor's firm within the past three years. The reference shall include the name of the agency, the name of the project, the date of the project, and the agency contact (telephone, fax, and e-mail). The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction. **(Submit at Pre-Construction Meeting)**
- B. During the course of the project, the detailed, work-specific Bypass Pumping/Flow Diversion Plan for any bypass utilizing multiple pumps, or a single pump greater than 4" discharge, shall be submitted to the Engineer at least 10 days before required. This plan shall outline all provisions and precautions, to be taken by the Contractor, regarding the handling of existing wastewater flows. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to insure proper protection of the facilities. The Plan shall also

include details of protection of the access and bypass pumping locations from damage due to the discharge flows, compliance with the requirements and permit conditions specified in these Contract Documents. No construction shall begin until all provisions and requirements have been reviewed and authorized by the Engineer.

C. The Contractor shall submit two copies of the Flow Bypass Pumping/Flow Diversion Plan, described in Item 1.02(B) above, for each sewer bypass set-up with sufficient detail to show:

1. Staging areas for pumps
2. Sewer plugging method and types of plugs
3. Number, size, material, location, and method of installation of suction piping
4. Bypass pump sizes, capacity, number of each size to be on site and power requirements
5. Calculations for selection of bypass pump size
6. Standby power generator size, location
7. Downstream discharge plan
8. Method of protecting discharge manholes or structures from erosion and damage
9. Thrust and restraint block sizes and locations
10. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill where required
11. Method of noise control for each pump and/or generator
12. Any temporary pipe supports, including rollers and elevated rollers, as well as anchoring required
13. Design plans and computation for access to bypass pumping locations indicated on the drawings
14. Schedule for installation of and maintenance of bypass pumping lines
15. Plan indicating selection location of bypass pumping line locations

16. The Plan shall indicate the means by which flows from service laterals will be accommodated
- D. All proposed flow control arrangements, including flow bypass and/or diversion pumping plans for sewers, shall also include an emergency response plan to be followed in the event of a failure of the bypass pumping and/or diversion system. Contractor's emergency response plan shall be in accordance with the City's Emergency Response Plan.
- E. The Contractor shall notify the Engineer 24 hours prior to commencing actual flow bypass and/or diversion pumping operations. The Contractor flow control proposal shall be agreed to by the Engineer before the Contractor shall be allowed to commence sewerage bypass pumping and/or diversion.

### **1.03 RELATED SECTIONS**

- A. The Work of the following Sections apply to the Work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of Work.
  1. Section 02752: Internal Sewer Condition Assessment
  2. Section 02511: Preconditioning and Cleaning Manholes
  3. Section 02725: Pipebursting Method
  4. Section 02491: Rehabilitation of Sanitary Sewer Manholes

### **1.04 RESPONSIBILITY FOR OVERFLOWS OR SPILLS**

- A. It shall be the responsibility of the Contractor to schedule and perform his work in a manner that does not cause or contribute to incidence of overflows or spills of sewage from the sewer system.
- B. In the event of overflows caused by the Contractor's work activities, the Contractor shall immediately take appropriate action in accordance with the City's Emergency Response Plan (ERP), to contain and stop the overflow, clean up the spillage, disinfect the area affected by the spill, and notify the designated Engineer in a timely manner. The Contractor shall prepare his own written Standard Operating Procedure (SOP) for handling and reporting spills, which shall be compatible with the City's ERP.
- C. Contractor will indemnify and hold harmless the City for any fines or third-party claims for personal or property damage arising out of a spill or overflow that is fully or partially the responsibility of the Contractor, including

the legal, engineering and administrative expenses of the City in defending such fines and claims.

## **PART 2 – PRODUCTS**

### **2.01 PUMPING EQUIPMENT**

- A. All pumps used shall be fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in the priming system. The pumps may be electric or diesel powered. All pumps used must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of effluent flows.
- B. The Contractor shall provide the necessary stop/start controls for each pump.
- C. The Contractor shall include one stand-by pump of each size to be maintained on site for each by pass set up unless otherwise agreed with the Engineer.
- D. The Contractor shall design all piping, joints, and accessories to withstand twice the maximum system pressure or 50 psi, whichever is greater. The back-up pump, appropriate piping, fuel, lubrication and spare parts shall be incorporated into the bypass arrangement at the site, ready for use in case of breakdown. A bypass “drill” shall be carried out by the Engineer before the bypass arrangement is accepted on all sewers > 12” diameter, at no cost to the City. The drill shall demonstrate the incorporation of all standby equipment to handle flows when the main pump set is switched off. The Engineer’s instructions following the drill shall be adhered to in full at no additional cost to the City.
- E. No more than two (2) pump discharge hoses shall be used for the bypass/diversion over the length of the line of segment(s). If the flow exceeds the capacity of 2 “hoses”, then rigid piping shall be used. The rigid piping shall consist of HDPE or steel pipes with suitably pressure rated couplings to withstand twice the maximum system pressure or 50 psi, whichever is greater.
- F. Under no circumstances will aluminum “irrigation” type piping or glued PVC pipe be allowed. Discharge hose will only be allowed in short sections and by specific permission from the Engineer.

### **2.02 SYSTEM DESCRIPTION**

- A. Design Requirements:

1. Bypass pumping systems shall have sufficient capacity to pump a peak flow in the pipes that are being rehabilitated or repaired. The Contractor shall provide all pipeline plugs, pumps of adequate size to handle wet weather peak flows, and temporary discharge piping to ensure that the total flow of the main can be safely diverted around the section to be repaired. Bypass pumping system will be required to be operated 24 hours per day.
2. The Contractor shall have adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure.
3. Bypass pumping system shall be capable of bypassing the flow around the work area and of releasing any amount of flow, up to full available flow, into the work area as necessary for satisfactory performances of work.
4. The Contractor shall make all arrangements for bypass pumping during the time when the main is shut down for any reason. System must overcome any existing force main pressure on discharge.

B. Performance Requirements:

1. It is essential to the operation of the existing sewerage system that there is no interruption in the flow of sewage throughout the duration of the project. To this end, the Contractor shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the sewage flow before it reaches the point where it would interfere with his work, carry it past his work, and return it to the existing sewer downstream of his work.
2. The design, installation, and operation of the temporary pumping system shall be the Contractor's responsibility. The bypass system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
3. The Contractor shall provide all necessary means to safely convey the sewage past the work area. The contractor will not be permitted to stop or impede the main flows under any circumstances.

4. The Contractor shall maintain sewer flow around the work area in a manner that will not cause surcharging of sewers, damage to sewers and that will protect public and private property from damage and flooding.
5. The Contractor shall protect water resources wetlands and other natural resources.

## **PART 3 – EXECUTION**

### **3.01 PLANNING**

- A. The Contractor shall be solely responsible for planning and executing sewer flow control, bypass, and diversion pumping operations. The Contractor shall be entirely liable for damages to private or public property that may result from his operations and for all cleanup, disinfection, damages, and resultant fines in the event of a spillage, flooding or overflow.

### **3.02 GENERAL**

- A. If, during normal rehabilitation work on manholes and sewers, where flow control devices, including flow bypass and diversion pumping have not been deployed, and wastewater flow depth exceeds the workable levels, the rehabilitation work shall be discontinued immediately. Rehabilitation work shall only resume when minimum flow levels prevail– normally between 2:00 am to 5:30 a.m. Under these circumstances, one or more of the following flow control systems shall be deployed at no additional cost to the City:
  1. Plugging or blocking
  2. High-velocity jet nozzles
  3. Bypass and/or diversion pumping
- B. Before any flow control arrangement is installed, the Contractor shall arrange to desilt the segment of sewer to be bypassed while still under flow. Subsequent jetting and final cleaning before rehabilitation or repair shall be undertaken while the segment of sewer is bypassed.
- C. Precautions:
  1. Contractor is responsible for locating any existing utilities in the area the Contractor selects to locate the bypass pipelines. The Contractor shall locate his bypass pipelines to minimize any



disturbances to existing utilities and shall obtain approval of the pipeline locations from the City and the Engineer. All costs associated with relocating utilities and obtaining all approvals shall be paid by the Contractor.

2. During all bypass-pumping operations, the Contractor shall protect mains, manholes, and all local sewer lines from damage caused by any equipment. The Contractor shall be responsible for all physical damage to mains, manholes, and all local sewer lines caused by human or mechanical failure.

### **3.03 PLUGGING OR BLOCKING**

- A. Insert sewer line plug into the line at a manhole upstream from the manhole or sewer that is to be rehabilitated and tested. For manhole rehabilitation, the plug shall be designed so that a portion of the sewage can be released downstream. During this portion of the operation, shut off or substantially reduce flows so that the manhole can be properly cleaned, prepared, and rehabilitated. Flow shall be shut off as required, to properly rehabilitate the manhole or sewer.
- B. Plugging or blocking of sewage flows shall incorporate primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance or work, it is to be removed in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.

### **3.04 FLOW BYPASS AND/OR DIVERSION PUMPING SCHEDULING**

- A. If the City is operating or maintaining conventional pumping facilities and/or flow bypass and/or diversion pumping in the construction area of the present Contract, the Contractor shall coordinate with the City as necessary to determine and effect optimum working arrangements.
- B. The Contractor shall immediately cease bypass and/or diversion pumping when so ordered by the City.

### **3.05 ENVIRONMENTAL PROTECTION MEASURES**

- A. During flow bypass and/or diversion pumping, the Contractor is prohibited from allowing any sewage to be dumped, or spilled in or onto the ground or any area outside of the existing wastewater collection system. In addition, due care and attention shall be given to prevent vehicular or pump fuel or lubrication oil to be leaked.

### **3.06 PIPE RESIDUE**

- A. When flow bypass and diversion pumping operations are complete, the residual contents of sewage in piping shall be drained into the existing sewer prior to disassembly.

END OF SECTION

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**SECTION 02752****Internal Sewer Condition Assessment****PART 1 – GENERAL****1.01 SCOPE**

- A. It is the intent of this contract to assess the internal structural and service condition of sewers prior to preconditioning or rehabilitation. Assessment will be performed using pan and tilt color camera-CCTV. In those circumstances where depth of flow is too great for CCTV, sonar or a combination of sonar and CCTV shall be used.
- B. It is also the intent of this contract to inspect individual sewer lines that have been preconditioned to further assess condition and record findings.
- C. It is the responsibility of the Contractor to comply with OSHA regulations, the City of Atlanta's Safety Guidelines, and the City of Atlanta's Confined Space Guidelines as applicable. The Contractor shall provide written documentation that all workers have received the training required under these regulations and guidelines.
- D. The form of internal condition assessment that is required as part of this Contract as follows:
  - 1. Sewer inspection – Viewing the sewer (“pull-through”) pursuant to investigative work possibly incorporating a radio-sonde transmitter for locating purposes and/or following other operational activity including:
    - a. Locating manhole(s) and/or lateral(s) with or without radio-sonde
    - b. Sewer preconditioning and cleaning activities
    - c. Sewer rehabilitation, including point repairs
    - d. Such other similar purposes as may be required by the engineer
    - e. Sewer inspection shall be carried out manually or with the aid of CCTV and/or sonar equipment, to assess overall condition. No detailed data logging is required, but a report containing header information only is required.
  - 3. Service lateral inspection – Assess and document the internal condition of all Connections and Junctions pursuant to investigative work and/or following other operational activity including:

- a. Locating lateral(s) with or without radio-sonde
- b. Sewer preconditioning and cleaning activities
- c. Service lateral rehabilitation, including point repairs
- d. Such other similar purposes as may be required by the Engineer
- e. Service lateral inspection shall be carried out manually or with the aid of CCTV and/or Sonar equipment, if required by one of the four conditions above, to assess overall condition. No detailed data logging is required, but a report containing header information only is required.

## 1.02 SUBMITTALS

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

<u>Type of Submittal</u>	<u>Time/Frequency of Submittal</u>
Experience Record of Contractor and/or Subcontractor(s)	<b>With the Bid Documents</b>
Listing of CCTV and SONAR Equipment	Before the Work Begins
2 Copies of CCTV and SONAR findings (2 hard copies of fully detailed logs incorporating a summary statistical breakdown of defects and main findings, 2 electronic discs of fully detailed logs and CD-ROMS of video output)	One week After Completion of Section
Daily Logs and Progress Reports	Daily
Confined Space Entry Logs	Bi-Weekly

- B. Daily reports shall be provided via e-mail to the designated engineer. Daily reports shall be provided no later than 5:00PM on the second day following the survey. Weekly reports shall be provided no later than 5:00PM on the first Monday following the week of the survey.

- C. The Contractor shall complete a daily written record (diary) detailing the work carried out and any small items of work which were incidental to the contract. The Contractor shall include in his daily record, reference to:

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

2. Weather: conditions, e.g. rain, etc.
  3. Equipment: on site, e.g. specialist cleaning, by-pass equipment, etc.
  4. Submittals: to the designated engineer representative
  5. Personnel: on site by name, e.g., all labor, Specialist Services, etc.
  6. Accident: report, e.g. all injuries, vehicles, etc.
  7. Incident: report, e.g. damage to property, property owner complaint, etc.
  8. Major defects encountered, including collapsed pipe, if any: e.g. cave-ins, sink holes, etc.
  9. Visitors: on site
- D. The designated Engineer on site shall certify receipt of the daily record noting any items and adding any observations with reference to claims for payment to the Contractor. The Engineer may at his discretion, for which the Contractor must receive direction in writing, an exception to this requirement for weekly submission of progress rather than for daily submission.

### **1.03 REQUIREMENTS AND EXTENT OF INSPECTION**

- A. The Contractor shall inspect pipelines with color pan and tilt CCTV imagery and sonar and or combined color pan and tilt CCTV/Sonar (TISCIT) as specified so as to record all relevant features and to confirm their structural and service condition. Inspections of pipelines shall be carried out in accordance with the reporting format determined by the Engineer. A sample report sheet is attached to this specification (Attachment B) and includes the recording of both target total length of sewer inspected between manholes as well as actual length inspected.
- B. All CCTV/sonar operator(s) responsible for direct reporting of sewer condition shall have a minimum of 3 years previous experience in surveying, processing, and interpretation of data associated with CCTV and sonar inspections. The Contractor shall provide the designated Engineer with written documentation that all CCTV and sonar survey operators meet these experience requirements which shall include a list of projects undertaken as well as client name and telephone number for reference.
- C. All approved Contractors will be required to provide certification that they have undergone training prior to undertaking internal condition assessment work in the City of Atlanta. Material, Shape and Lining Coding used throughout the project will conform to the attached listing (Attachment C). General inspection logging requirements are also included with this Section

(Attachment D). Training will be carried out at the Contractor expense. No charge will be levied for the training, which is expected to last two days.

- D. The Contractor shall complete a daily written record (diary) detailing the work carried out and any small items of work which were incidental to the Contract.

#### **1.04 INSPECTION UNITS**

- A. The Contractor shall provide sufficient inspection units and all relevant ancillary equipment, including standby units in the event of breakdown, in order to complete all sewer and manhole inspections as specified.

#### **1.05 INSPECTION VEHICLE**

- A. The inspection vehicle shall comprise two totally separate areas. One of these, designated as the viewing area, shall be insulated against noise and extremes in temperature, include the provision for air conditioning, and shall be provided with means of controlling external and internal sources of light in a manner capable of ensuring that the monitor screen display is in accordance with the specification. Seating accommodation shall be provided by the Contractor to enable two people, in addition to the operator, to view clearly the on-site monitor, which shall display the inspection as it proceeds.
- B. The working area shall be reserved for equipment, both operational and stored, and no equipment utilized within the sewer shall be allowed to be stored in the viewing area.
- C. The Contractor shall allow in the rates and provide at no additional cost, a vehicle when required by the City, together with a driver, to assist with visual reconnaissance surveys and/or inspections. The vehicle shall be suitable for carrying the survey team and laborers and shall be equipped with the following:
  - 1. Equipment for easing and lifting manhole covers.
  - 2. Sewer safety equipment.
  - 3. Road safety equipment.
  - 4. Protective clothing for the survey/inspection teams comprising coveralls, boots, gloves, hard hat etc.

#### **1.06 CCTV INSPECTION AND OPERATIONAL EQUIPMENT REQUIREMENTS**

- A. The inspecting equipment shall be capable of inspecting a length of sewer up to at least 1500 ft. when entry onto the sewer may be obtained at each

end and up to 100 ft. by rodding or up to 750 ft. where a self propelled unit is used, where entry is possible at one end only. The Contractor shall maintain this equipment in full working order and shall satisfy the designated Engineer at the commencement of each working shift that all items of equipment have been provided and are in full working order.

- B. Each inspection unit shall contain a means of transporting the CCTV camera and/or sonar equipment in a stable condition through the sewer under survey and/or inspection. Such equipment shall ensure the maintained location of the CCTV camera or sonar equipment when used independently on or near to the central axis of a circular shaped sewer when required in the prime position.
- C. Where the CCTV camera and/or Sonar head are towed by winch and bond through the sewer, all winches shall be stable with either lockable or ratcheted drums. All bonds shall be steel or of an equally non-elastic material to ensure the smooth and steady progress of the CCTV camera and/or Sonar equipment. All winches shall be inherently stable under loaded conditions.
- D. Each unit shall carry sufficient numbers of guides and rollers such that, when surveying or inspecting, all bonds are supported away from pipe and manhole structures and all CCTV/Sonar cables and/or lines used to measure the CCTV camera's/sonar head location within the sewer are maintained in a taut manner and set at right angles where possible, to run through or over the measuring equipment.
- E. Each unit shall carry a range of flow control plugs or diaphragms for use in controlling the flow during the inspection. A minimum of one item of each size of plug or diaphragm ranging from 6 inches to 2 feet diameter inclusive shall be carried.
- F. Each inspection unit shall have on call equipment available to carry out the flushing, rodding and jetting of sewers as and when such procedures are deemed to be necessary.

#### **1.07 FIELD SUPERVISION BY CONTRACTOR**

- A. The Contractor shall maintain on site at all times a competent field supervisor in charge of the inspection, see item 3.1 below. The field supervisor shall be approved in writing by the designated Engineer prior to commencement of Work. Any change of supervision must also be approved in writing by the designated Engineer prior to the change. The field supervisor shall be responsible for the safety of all site workers and site conditions as well as ensuring that all work is conducted in conformance with these specifications and to the level of quality specified.



## **1.08 APPLICATION OF INSPECTION TYPE**

- A. The following guidelines concerning the use of CCTV and sonar shall be followed, subject to the review and approval of the designated Engineer:
1. Generally CCTV alone shall be used for internal condition assessment where the depth of flow of sewage is less than 25% of overall sewer diameter at the start of the survey. The Contractor will make an informed decision to continue should the depth of flow increase beyond the 25% level but no greater than 40% of overall sewer diameter at any time throughout the length.
  2. Generally CCTV combined with sonar shall be used for internal condition assessment where depth of flow of sewage varies from 25% to 75% of overall sewer diameter for sewers greater than 24-inches in diameter. Where the sewer is less than 24-inches in diameter and depth of flow of sewage exceeds 25% and is less than 75% of overall sewer diameter the designated Engineer shall instruct Contractor to either: (a) continue using CCTV (where depth of flow is only marginally greater than 25% of overall diameter) or (b) use sonar (by damming or plugging the sewer so that depth of flow exceeds 75% of overall diameter).
  3. Generally sonar alone shall be used where depth of flow in the sewer exceeds 75% of overall diameter and the level of the flow will be artificially increased, without the risk of flooding, to ensure that the pipe is completely surcharged.

## **PART 2 – PRODUCTS (Not Used)**

## **PART 3 – EXECUTION**

### **3.01 CLEANING PRIOR TO INTERNAL CONDITION INSPECTION**

- A. Where required by the City and only when instructed in writing, the Contractor shall clean the sewer prior to internal condition inspection. Cleaning shall be carried out in conformance with Section 02511 – Preconditioning and Cleaning of Manholes and Sewers.

### **3.02 SEWER CLEANING UNITS AND EQUIPMENT**

- A. The Contractor shall provide sufficient sewer cleaning units and equipment, including standby units in the event of breakdown, in order to complete cleaning operations as specified.

### 3.03 CCTV/SONAR – GENERAL

- A. CCTV Camera/Sonar Head Prime Position: The CCTV camera/sonar head shall be positioned to reduce the risk of picture distortion. In circular sewers the CCTV camera lens and/or sonar head shall be positioned centrally (i.e. in prime position) within the sewer. In non- circular sewers, picture orientation shall be taken at mid-height, unless otherwise agreed, and centered horizontally. In all instances the camera lens/sonar head shall be positioned looking along the axis of the sewer when in prime position. A positioning tolerance of  $\pm 10\%$  of the vertical sewer dimension shall be allowed when the camera is in prime position.
- B. CCTV Camera/Sonar Head Speed: The speed of the CCTV camera in the sewer shall be limited to 8 inches per second for surveys to enable all details to be extracted from the ultimate CD-ROM recording. Similar or slightly higher speed as agreed by the designated Engineer shall be provided for inspections. The speed of scanning sonar shall be limited to 4 inches per second.
- C. CCTV Color Camera: The Contractor shall provide a color pan and tilt camera(s) to facilitate the survey and inspection of all laterals, including defects such as hydrogen sulfide corrosion in the soffit of sewers and benching or walls of manholes over and above the standard defects that require reporting, where required by the designated Engineer. These will be carried out as part of the normal CCTV assessment as the survey or inspection proceeds when instructed by the designated Engineer. A 360° rotational scan indicating general condition must be implemented at every 50 feet interval (min.) along sewers, and at manholes and any salient, specified, defect features. The tilt arc must not be less than 225°.
- D. Linear Measurement:
  - 1. The CCTV/Sonar monitor display shall incorporate an automatically updated record in feet and tenths of a foot of the footage of the camera or center point of the transducer, whichever unit is being metered, from the cable calibration point. The relative positions of the two center points should also be noted.
  - 2. The Contractor shall use a suitable metering device, which enables the cable length to be accurately measured; this shall be accurate to  $\pm 1\%$  or 3 inches whichever is the greater.
  - 3. The Contractor shall demonstrate compliance with the tolerance in Sub-clause 3.7 D.2 is being complied with, using one or both of the following methods in conjunction with a linear measurement audit form which shall be completed each day during the survey:
    - a. Use of a cable calibration device

b. Tape measurement of the surface between manholes

A quality control form will be completed and submitted by the Contractor depicting the level of accuracy achieved.

4. If the Contractor fails to meet the required standard of accuracy, the designated Engineer shall instruct the Contractor to provide a new device to measure the footage. The designated Engineer retains the right to instruct the Contractor in writing, to re-survey those lengths of sewer first inspected with the original measuring device using the new measuring device.

E. Data Display, Recording and Start of Inspection:

1. At the start of each sewer length being inspected and each reverse set-up, the length of pipeline from zero footage, the entrance to the pipe, up to the cable calibration point shall be recorded and reported in order to obtain a full record of the sewer length. Only one survey shall be indicated in the final report. All reverse set-ups, blind manholes, and buried manholes shall be logged on a separate log. Video digits shall be recorded so that every recorded feature has a correct tape elapsed time stamp. Each log shall make reference to a start (ST) and finish (FH) manhole unless abandonment took place because of blockage. Manhole number shall be indicated in the remark's column of the detail report. Inspections must not extend over 2 CD-ROMs.
2. The footage reading entered on to the data display at the cable calibration point must allow for the distance from the start of the inspection to the cable calibration point such that the footage at the start of the survey is zero.
3. In the case of inspecting through a manhole where a new header sheet must be completed, the footage shall be set at zero with the camera focused on the outgoing pipe entrance.
4. At the start of each manhole length a data generator shall electronically generate and clearly display on the viewing monitor and subsequently on the CD-ROM recording a record of data in alpha-numeric form containing the following minimum information:
  - a. Automatic update of the camera's footage position in the sewer line from adjusted zero
  - b. Sewer dimensions
  - c. Manhole/pipe length reference numbers
  - d. Date of inspection

- e. Road name/location
  - f. Direction of inspection
  - g. Time of start of inspection
  - h. Sewer use (S-Sanitary Sewer, C-Combined Sewer, etc)
  - i. Material of construction of the pipe
- 5. The size and position of the data display shall be such as not to interfere with the main subject of the picture.
  - 6. Once the survey of the pipeline is under way, the following minimum information shall be continually displayed:
    - a. Automatic update of the camera's footage position in the sewer line from adjusted zero (see Sub-clause A4)
    - b. Sewer dimensions in inches
    - c. Manhole or pipe length reference number (PLR). General convention allows upstream manhole number to be designated PLR
    - d. Direction of survey, i.e., downstream or upstream
  - 7. Correct adjustment of the recording apparatus and monitor shall be demonstrated by use of the test tape or other device approved by the Contractor. Satisfactory performance of the camera shall be demonstrated by the recording of the appropriate test device at the commencement of each day for a minimum period of 30 seconds.
  - 8. Footage and corresponding time elapsed video digit shall be given throughout inspection for all construction features encountered unless otherwise agreed.
  - 9. Where silt encountered is greater than 10 percent of the diameter of the pipe, the depth of silt shall be measured and recorded at approximately 50-foot intervals.
  - 10. CD-ROM capacity shall be adequate to record two hours of video inspection. Recording of a single segment shall not extend over more than one CD-ROM. No unrecorded gaps shall be left in the recording of a segment between surveys/inspections as the original video tape.
  - 11. Only segments between manholes on the same sewer reach or basin shall be included on one CD-ROM. There shall be no "split surveys" or "split-basins" between CD-ROMs.

12. All continuous defects shall incorporate a start and finish abbreviation in the log report
- F. Coding: Material, Shape, and Lining Coding, and conventions used throughout the project will be provided by the designated Engineer. See Attachments to this Section. The CCTV Contractor must ensure that all operators conform to the detailed requirements of the reporting procedure concerning feature description and feature definition as well as the Sewer1.Dat computer file format attached. An example Sewer1.Dat Data File has also been provided in Attachment E.

### **3.04 CCTV AND SONAR SURVEY DATA SPECIFICATION**

A. CCTV Reporting:

1. No later than fourteen days following the completion of a pipeline inspection, Contractor shall submit to the Engineer two hard copies of all details, i.e. typed "Full English" reports including two floppy diskettes containing the data transfer file and two CD-ROM's shall be submitted to the designated Engineer. The supplied data and information shall remain the property of the City.
2. The report shall be computer validated using AMPS/EXAMINER software, or equivalent approved by the designated Engineer, and presented on two floppy diskettes to provide a summary listing of the number and type of features including defects found for each section of pipeline. The report format is shown in the attached specimen report. This specimen report sheet shall be accurately and fully adopted in style, format and in detail.
3. When requested, the Contractor shall provide hard copy output or manually completed site coding sheets at the time of the inspection and shall forward copies of these sheets to the designated Engineer, preferably each day, but at least every other day, together with a daily report on progress.
4. Inspection reports shall contain all header information. A summary observation shall be included as a comment in the header indicating the general condition of the segment for which the inspection was required. The detailed section of the report will include coding for the for the start (ST), manhole (MH), water level (WL), finish manhole (MH) where appropriate, and finish (FH) or survey abandoned (SA) as appropriate, together with all the supplemental information otherwise required for the "survey".

- B. Site Coding Sheets: Each sewer length, i.e. the length of sewer between two consecutive manholes, shall be entered on a separate coding sheet or entered separately electronically. Thus where a Contractor elects to "pull

through" a manhole during a CCTV and/or Sonar inspection a new coding sheet shall be started at the manhole "pulled or walked through" and the footage re-set to zero on the coding sheet. Where a length of sewer between consecutive manholes is inspected from each end (due to an obstruction) two coding sheets should be used. Where a length of sewer between two consecutive manholes cannot be inspected or attempted for practical reasons a (complete header) coded sheet shall be made out defining the reason for abandonment. At uncharted manholes a new coding sheet must be started and the footage re-set to zero.

- C. Measurement Units: All dimensions shall be in feet and inches. Measurement of sewers shall be to the nearest inch.
- D. CCTV Photographs:
1. Photographs shall be taken of all defective laterals and pipeline defects where requested in writing. Where a defect is continuous or repeated the photographs shall be taken at the beginning of the defect and at not less than 10 foot intervals thereafter. Where photographs are not otherwise required a general condition photograph shall be taken not more than 50 feet after the previous photograph.
  2. CCTV Photographs must clearly and accurately show what is displayed on the monitor, which shall be in proper adjustment.
  3. Photographs must be durable and 3"x5" size and shall be supplied in a suitable album or storage drawer the standard of which shall be to the satisfaction of the designated Engineer.
  4. Still photographs shall be durable and clearly identified in relation to the photograph number (cross referenced to the site survey sheet) street location, sewer dimensions, manhole start and finish numbers, survey direction, footage and date when the photograph was taken.
  5. The annotation shall be clearly visible and in contrast to its background, shall have a figure size no greater than 14 point, and be type printed in upper case.
  6. The annotation shall be positioned so as not to interfere with the subject of the photograph.
  7. The Contractor shall provide color photographs using digital camera or such other mutually agreed upon hard copy color image together with electronic copy.
- E. Control Sample Photographs and/or CD-ROMs: The designated Engineer may issue a written instruction to the Contractor to provide a sample of the

photographs and/or CCTV/Sonar video taken during the contract period which the Contractor shall provide within 5 working days of receiving the written instruction.

### **3.05 SERVICE LATERAL INSPECTION DATA SPECIFICATION**

- A. For service line inspections launched from the mainline during a mainline inspection:
  - 1. Contractors will assess and document the internal condition of all Connections and Junctions using the previously described procedures, with the exception of ending abandoned service line inspections launched from the mainline. Use “GOA” to note abandonment.
  - 2. A number will be entered into the “Photo No.” field that represents a sequential numbering of the services found. The services will be numbered 01, 02, 03, etc. When the inspection is a reverse setup and the number of services has not exceeded 50, the numbering shall begin with 51 on the reverse. (It is unlikely that there will be more than 50 services on the first survey that is abandoned, however, should this occur, numbering shall continue on the reverse with the same sequence begun on the first survey.)
  - 3. The end of the inspection of the service line at the property line shall be entered “GO” (General Observation code), along with the service line number in the “Photo No.” column, and the distance to the end of the survey in the “Remarks” column. The “Distance” will also be the same as for the Connection or Junction. When a survey is abandoned, the code “GOA” shall be used and the reason for the abandonment stated in the “Remarks” column.
  - 4. Measurements shall be taken from the wall of the mainline pipe.
- B. For service line inspections conducted from a cleanout (or as a separate inspection launched from the mainline), the inspection shall be recorded as a normal mainline inspection with the following exceptions:
  - 1. When the mainline is inspected or surveyed, all services shall be numbered using a number in the “Photo No.” field, as explained above.
  - 2. The “Start Manhole” shall be entered as the upstream manhole followed by “\_01”, “\_02”, etc. Where the “\_01” corresponds to the service number assigned when the mainline was surveyed.
  - 3. The upstream manhole shall be entered as the PLR.

4. The “Address” shall be the address of the house connected by the service line.
5. If the inspection begins at a cleanout, the “Direction” is entered as “D”. If the inspection begins from the mainline, the “Direction” is entered as “U”.
6. “=Service Line=” shall be entered in the “Location Details” field.

### 3.06 CCTV/SONAR PERFORMANCE

- A. Color CCTV/Sonar: All CCTV and/or Sonar work shall use color CCTV/sonar reproduction.
- B. CCTV Picture Quality:
  1. An approved test device shall be provided and be available on site throughout the Contract, enabling the tests specified in this clause to be checked.
  2. The test card shall be Marconi Regulation Chart No. 1 or its approved derivatives with a color bar, clearly differentiating between colors, with no tinting, to show the following: White, Yellow, Cyan, Green, Magenta, Red, Blue, and Black.
  3. At the start of each and every working shift, the camera shall be positioned centrally and at right angles to the test card at a distance where the full test card just fills the monitor screen. The Contractor shall ensure that the edges of the test card castellations coincide with the edges of the horizontal and vertical scan (raster). The card shall be illuminated evenly and uniformly without any reflection. The illumination shall be to the same color temperature as the color temperature of the lighting that recorded for subsequent use by the designated Engineer, the recording time to be at least 30 seconds. The type of camera used is to be identified on the test recording. The recording must show the camera being introduced into the test device and reaching its stop position. Other test devices may be used subject to approval by the designated Engineer. Test recordings shall also include the time and date of the recording. Test recordings shall be delivered to the Engineer on a weekly basis. The test recordings may be delivered on VHS tape or CD-ROM.
  4. The electronic systems, television camera and monitor shall be of such quality as to enable the following to be achieved:
- C. Shades of Gray: The gray scale shall show equal changes in brightness ranging from black to white with a minimum of five clearly recognizable stages.



- D. Color: With the monitor adjusted for correct saturation, the six colors plus black and white shall be clearly resolved with the primary and complementary colors in order of decreasing luminance. The gray scale shall appear in contrasting shades of gray with no tint.
- E. Linearity: The background grid shall show squares of equal size, without convergence/divergence over the whole of picture. The center circle shall appear round and have the correct height/width relationship ( $\pm 5\%$ ).
- F. Resolution: The live picture must be clearly visible with no interference and capable of registering a minimum number of TV lines/pictures height lines. The resolution shall be checked with the monitor color turned down. In the case of tube cameras this shall be 600 lines.
- G. Color Constancy: To ensure the camera shall provide similar results when used with its own illumination source, the lighting shall be fixed in intensity prior to commencing the survey. In order to ensure color constancy, generally no variation in illumination shall take place during the survey.
  - 1. The Contractor shall note that the designated Engineer may periodically check both the live and picture color consistency against the color bar. Any differences will require re-survey of the new length or lengths affected, at the Contractor's expense.
- H. Playback and CD-ROM Labeling:
  - 1. Playback video shall be capable of a resolution of a minimum of 400 lines recorded at standard (SP setting) VHS speed. CD-ROM playback imaging shall be linked to electronic out put of alpha-numeric data so that if necessary direct interrogation of database can take place with simultaneous viewing of CCTV/sonar images.
  - 2. Each CD-ROM disc shall be labeled by reference to the header record for the survey section completed together with the following information:
    - a. Client Name: "City of Atlanta"
    - b. Project Name
    - c. Contractor's Name
    - d. Contractor's logo is optional
    - e. Survey date(s)
    - f. Survey Method: "CCTV – Internal Sewer Condition Assessment"
    - g. CD Volume Label – "XXXXXXYYZZTT", where:

- i. XXXXXX is the Sewershed abbreviation, as provided by the City
    - ii. YY is the Company abbreviation, as provided by the City
    - iii. ZZ is the unique crew leader initials
    - iv. TT is a sequence number maintained for the crew leader
  - h. Video Filename(s): Alphanumeric using any convention. Filename is to be included in the header field as specified. Filename is limited to 5 characters (e.g. "00001" to "00004")
- I. CCTV Focus/Iris/Illumination: The adjustment of focus and iris shall allow optimum picture quality to be achieved and shall be remotely operated. The adjustment of focus and iris shall provide a minimum focal range from 6 inches in front of the camera's lens to infinity. The distance along the sewer in focus from the initial point of observation shall be a minimum of twice the vertical height of the sewer. The illumination must allow an even distribution of the light around the sewer perimeter without the loss of contrast picture, flare out or shadowing.
- J. Sonar Survey Requirements:
- 1. Rates shall allow for:
    - a. Complete structural and service assessment to the equivalent standard as that obtained through conventional CCTV imagery
    - b. The means of attenuating flow, where necessary, to facilitate appraisal of the full sewer cross section
    - c. Measurement of flow depth and silt depth.
  - 2. Rates shall allow for continuous output on conventional annotated CD-ROM format of all sewers surveyed, supported by complete defect code sheets. Additionally, silt levels shall be assessed as a percentage depth of sewers at 25 foot intervals for each pipeline surveyed. To facilitate this requirement, and in addition, to assist in diametrical measurement particularly where a sewer is deformed and/or where a sewer has suffered hydrogen sulfide corrosion; screen graphic facilities shall be made available to enable measurements to be taken in any position across the diametrical profile of the sewer as the sonar survey proceeds and where specifically directed by the designated Engineer.
  - 3. Where combined CCTV and Sonar imagery is required the output shall display combined CCTV and Sonar images of the sewer being

surveyed. The sonar image shall be superimposed on the real CCTV image as a combined operation.

4. Rates shall allow for a comprehensive final report on the findings concerning major defects, including fractures, displaced joints, deformation, corrosion and lateral intrusions, as well as dominant surface features, including encrustation and silt depths.
5. The monitor display resolution shall be a minimum of 512 x 512 pixels. The color palette shall have a minimum of 16 colors with text.
6. The picture update speed shall not compromise compliance with Sub-clause A (1) or result in unsatisfactory picture resolution.
7. The range of resolution shall be  $\pm 1/10$  inch.
8. The maximum beam width of sonar energy pulse shall be no greater than 2 degrees from the center of the transducer.
9. The transducer shall be of the continuous scanning type.

K. Contractor's Data Quality Control Procedure:

1. The Contractor shall operate a quality control system, to be approved by the designated Engineer, which will effectively gauge the accuracy of all survey reports produced by the operator.
2. The system shall be such that the accuracy of reporting is a function particularly of:
  - a. The number of faults not recorded (omissions).
  - b. The correctness of the coding and classification of each fault recorded.
3. The minimum levels of accuracy to be attained under the various survey headings are as follows:
  - a. Header Accuracy 95%
  - b. Detail Accuracy 85%

- L. The Contractor's data quality control program shall include routine outside auditing of the work completed by a qualified subcontractor. The qualified subcontractor shall meet the minimum specified Contract requirements for the performance of the work and shall be approved in writing by the Engineer. The accuracy of the Contractor's data shall be based on the percentage of the data confirmed correct by the subcontractor. The minimum acceptable accuracy of the data shall be 85%. The general sequence of the auditing shall be as follows:

1. The Engineer shall randomly select one day per month, typically in the first week of the month, and the work performed during this day shall be reviewed and/or repeated by the qualified subcontractor.
2. If the work is greater than or equal to 85% accurate, no further outside auditing will be required for the month unless requested by the Engineer at his sole discretion. The cost for this audit is included in the allowances specified in the Bid Form.
3. If the work is less than 85% accurate, the Contractor shall at his own expense repeat and/or correct the work and have the work re-audited by the qualified subcontractor.
4. If this work is still less than 85% accurate, the Contractor shall repeat and/or correct and have the work re-audited, at his own expense, until the work is greater than or equal to 85% accurate.
5. When this re-audited work is found to be greater than or equal to 85% accurate, the Contractor shall have the work of another randomly selected day in the same month reviewed and/or repeated by the qualified subcontractor at the Contractor's own expense.
6. Steps 2 through 5 shall be repeated at the Contractor's own expense until the selected day is 85% accurate on the initial audit.
7. The occurrence of five randomly selected days not achieving 85% accuracy on initial subcontractor review will constitute cause for dismissal.
8. If the Contractor successfully meets the 85% accuracy requirement for the initial randomly selected day for two consecutive months (Step 2 above), the Contractor may subsequently audit one day every other month. The Contractor may continue auditing one day every other month until the initial randomly selected day does not meet 85% accuracy, at which time it must resume auditing one day every month.

### **3.07 COLLAPSED SEWERS/DEFECTIVE MANHOLES**

- A. Any sewer found with greater than 10% deformation (i.e. collapsed or near to collapse) must be reported to the designated Engineer immediately for remedial action. In the event of emergency phone (404)-624-0751.

- B. Any manhole found broken, cracked, with missing covers or surcharged, must be reported to the designated Engineer immediately for remedial action. In the event of emergency phone (404)-624-0751.
- C. Any sewer found where the existing conditions pose a threat of personal injury to the public, such as a collapsed sewer with attendant depression to roadway, must be protected by the Contractor until the Engineer arrives at the job site. In the event of emergency phone (404)-624-0751.
- D. Any manhole found where the existing conditions pose a threat of personal injury to the public, such as broken, cracked or missing covers or covers found in traveled portions of any sidewalk or roadway must be protected by the Contractor until the Engineer arrives at the job site. In the event of emergency phone (404)-624-0751.

### **3.08 TRAFFIC CONTROL**

- A. Refer to Specification Section 01500: Temporary Control of Construction Operations for requirements.

## **ATTACHMENT A**

## **DEFINITIONS**

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## DEFINITIONS

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### Notes:

- Features that are visible in the sewer during surveys/inspections and other key items are defined below.
  - Sewer defects are categorized under the following headings: Structural, Service, Protective Lining, and Constructional.
  - Normal parts of speech abbreviations apply (e.g., (n) for noun, (v) for verb, etc.)
- 

### Sewer Defects - Structural

**Angular Joints:** Adjacent conduit sections are angularly displaced at the joint.

**Break:** Pieces of the sewer conduit are noticeably displaced, differentially, and some pieces could be missing. A broken sewer is the most structurally serious defect. A hole in the fabric of the sewer is also classified as broken. A chipped sewer wall is not coded as broken, but should be entered into the “general comments” section of the coding sheet as such.

**Crack:** Crack line visible on the sewer wall, with the pieces of the wall still in place. The crack may be either longitudinal (i.e., following the longitudinal axis of the sewer), circumferential (i.e., around the periphery of the sewer), or spiral (i.e. helically around the sewer). Cracks are not themselves serious defects, but are indicative of the initial stages of sewer deterioration. Multiple cracks are a combination of both longitudinal and circumferential cracks.

**Collapse:** Structural integrity of the sewer conduit has been completely lost and deformation is greater than 10 percent. Percentage loss of cross-section is estimated to the nearest 5 percent.

**Corrosion:** The destruction of a cementitious or metal wastewater component and its material properties, because of a reaction with its surroundings (the sewage environment). Corrosion is usually a defect observable specifically in the soffit, and generally above the springings of the sewer conduit and in the proximity of force main discharges. Four levels of corrosion are identifiable:

- *Light Corrosion* is characterized by a slightly depressed pH (<6.0), and a concrete surface that can be penetrated with a sharp instrument under moderate hand pressure with the removal of some concrete material. The original concrete surface is fully recognizable and aggregate may or may not be exposed.



- *Moderate Corrosion* is characterized by some concrete loss with aggregate slightly exposed, but the original concrete surface is still distinguishable. The surface may have a thin covering of pasty material that is easily penetrated. There is generally a depressed wall pH (<5.0).
- *Severe Corrosion* is characterized by significant measurable concrete loss or active corrosion. Aggregate and, occasionally, reinforcing steel is exposed. The original concrete surface is not distinguishable. The surface is covered with soft, pasty corrosion products where active scouring is not present. There is generally a depressed wall pH (<0.3) indicating active corrosion.
- *Extreme Corrosion* is characterized by corrosion so extensive that the wall of the sewer has been completely corroded and earth can be observed behind the sewer wall.

Normal pH ranges (around 6.0) are applicable. A normal concrete surface is defined as that which cannot be penetrated or removed by a sharp instrument under moderate hand pressure. The surface of the concrete may have biological growth (slime build) and moisture but the concrete is normal and aggregate is not exposed.

**Deformation:** A measure of the vertical and horizontal reduction or change in cross-section of a sewer as a result of self-weight or external forces. Three levels of deformation are normally reported. These are:

- 0-5 percent deformation is acceptable, may not need structural upgrading, and normally may require periodic monitoring.
- 5-10 percent deformation requires some form of structural enhancement, possibly a lining;
- >10 percent deformation is a collapse condition and the sewer needs replacing.

Brick sewers may have some irregular or misshapen cross-sections built into the original sewer. Plastic pipes can deform without structural defects. Normally a built-in deformation of 6 percent is allowable in plastic sewers.

For inspection purposes, deformation is normally recorded to the nearest 5 percent.

**Fracture:** Wall of sewer visibly separated along the length and/or circumference of the sewer with the pieces of the sewer wall in place. The fracture may be either longitudinal (i.e., following the longitudinal axis of the sewer), circumferential (i.e., around the periphery of the sewer, or spiral (i.e. helically around the sewer). The sewer may be seen to suffer from some distortion. The defect is indicative of the secondary stage of sewer deterioration and constitutes a more serious problem than a crack. Multiple fractures are a combination of both longitudinal and circumferential fractures.

**Offset (Displaced) Joint:** Adjacent conduit sections are not concentric at the joint. Displacements are recorded as a fraction of the wall thickness of the conduit (t) as follows:

- *slight* -  $< t$
- *medium* -  $1 < t < 1.5$
- *large* -  $> 1.5 t$

**Separated (Open) Joint:** Adjacent conduit sections are open at the joint. Displacements are recorded as a fraction of the wall thickness of the conduit (t) as follows:

- *slight* -  $< t$
- *medium* -  $1 < t, 1.5$
- *large* -  $1.5 t$

**Surface Damage:** Surface of sewer conduit is damaged by spalling, wear, erosion, or any other deleterious mechanism other than corrosion (see **Corrosion**).

## **Sewer Defects - Service**

**Debris:** Obstructions in a sewer line, excluding items mechanically attached to the line such as protruding service connections, protruding pipe and joint materials. Percentage loss is normally given to the nearest 5 percent. (See also Silt)

- Debris is normally identified by the following characteristics:
- *Debris.* Pebbles, pieces of concrete, wood chippings, sticks, brick, and other extraneous material that could cause turbulence and/or reduction in hydraulic capacity
- *Ragging.* Paper and sanitary products

**Encrustation:** Mineral deposits left on the wall or joint of a sewer by the effect of infiltrating groundwater containing dissolved salts. Normally described as being light, medium, or heavy, and characterized by loss of percentage cross-sectional area, thus:

- light -  $< 5$  percent
- medium -  $> 5$  loss  $< 20$  percent
- heavy  $> 20$  percent loss

**Ground Water Infiltration:** Water entering sewers and manholes via defective joints and connections, broken pipes, fractured manholes, etc., due to the effects of a high ground water table. Various levels of ground water infiltration are identified, namely as follows:

- **Weeper** - The slow ingress of infiltration through sewer/manhole joints or structural defects, identified by glistening effect of the water under the influence of survey lighting apparatus
- **Dripper** - Infiltration characteristically dripping into the wastewater system through sewer/ manhole joints or structural defects
- **Runner** - Infiltration running into the wastewater system through sewer/manhole joints or structural defects
- **Gusher** - Infiltration rapidly entering the wastewater system under hydrostatic pressure through sewer/manhole joints or structural defects

**Line Deviation:** Vertical or horizontal divergence of alignment of sewer conduit line encountered during inspection, also known as "change in direction" or "change in alignment."

**Obstruction:** An obstruction in the sewer conduit resulting in stoppage of the inspection or survey. Obstructions can be:

- *General*, e.g., shopping cart, ball, or rock
- *Mechanical*, e.g., water main installed through sewer
- *Structural*, e.g., support mechanism such as a pile or tie back anchor
- *Strata*, e.g., rock or stone which has become dislodged and fallen onto the invert

**Roots:** Intrusion of roots through defects in sewer conduits, laterals, or manholes. Described as fine, medium, or tap roots, depending on severity as follows:

- *Fine roots:* slender or thin fibrous roots that partially result in a reduction in flow capacity
- *Medium roots:* mass of fine roots less than 50% of the area of the pipe
- *Tap roots:* individual root strands more than 1/2 inch thick.
- *Ball roots:* mass of roots more than 50% of the area of the pipe

**Silt:** Any and all solid or semi-solid materials, including fine and granular material such as sand, grit, gravel and rock, as well as grease, sludge, slime, debris or any other loose material or encrustation lodged in the manhole or sewer.

**Water Level:** The depth of water at the observed point in the sewer conduit, in percentage to nearest 5 percent.

## **Sewer Defects - Protective Lining**

**Blister:** A concentrated swelling of the *protective coating* over the host conduit.

**Bulge:** A concentrated swelling of the *protective liner* over the host conduit.

**Degradation:** Break down by biological action of the protective liner, protective coating, or host conduit.

**Delamination:** Separation of internal layers of the protective lining material. Loss of internal bonding, chemical or mechanical.

**Detached:** Extensive separation of the protective lining material or protective coating from the host conduit.

**Missing:** Where the sewer conduit has no protective coating or protective lining through the sewer conduit as indicated on as-built drawings, or on job files.

**Tear:** When the protective lining has become torn.

**Weld Failure:** The opening up of the weld between adjacent pieces of protective lining due to physical or chemical breakdown.

**Wrinkle:** The incorporation of a longitudinal or circumferential fold, typically in a CIPP lining due to stretching or excessive material. Normally the wrinkle should not exceed more than 1 percent of diameter for protective linings equal to or greater than 24 inches, and more than 2 percent of diameter for protective linings in sewers less than 24 inches. (Establish using 3-dimensional templates or similar.)

## **Sewers - Construction**

**Battens:** Anchoring strips used to attach PE, PVC, or HDPE liners to the host sewer conduit (the sewer being treated) or annulus grout. Battens are normally made of plastic or stainless steel.

**Buried Manhole:** A manhole on a sewer, which is not visible at ground surface. A buried manhole may or may not be designated for assessment.

**Chimney:** The cylindrical, variable height access portion of the manhole structure. The chimney extends from the top of the corbel above the manhole chamber to the base of the manhole frame, and is used for adjusting the finished level of the manhole frame.

**Coal Tar Epoxy:** A chemically cured, two component coal tar coating which has been in use since the 1950's. In order to be successful as a coating, the surface preparation has to be of a very high order that is difficult, if not impossible, to achieve in the context of sewer conduits.

**Connection:** A sewer tap including break-in/hammer tap or saddle connection, of lateral sewer to another sewer.

**Construction Exit:** A stone-stabilized pad located at any point where traffic will be leaving a construction site to a public right-of-way, street, alley, sidewalk, or parking area.

**Corbel or Cone:** That portion of a manhole structure that slopes upward and inward from the barrel of the manhole to the frame diameter or required chimney (access shaft). Corbel refers to the oversailing brickwork that supports the cover and frame. Cone refers to a precast section.

**Critical Path Method (CPM):** A planning and scheduling technique involving the charting of all events and operations to be encountered in completing a given process, rendered in a form permitting determination of the relative significance of each event and establishing the optimum sequence and duration of operations.

**Crown:** The external elevation at the top of the sewer conduit (see also **Invert**, **Soffit**).

**Cured-in-Place (CIPP):** A pipe rehabilitation system in which the flexible lining (either epoxy resin or polyester resin) impregnated felt is water or air inverted or winched and inverted into an existing sewer and subsequently heat cured. The reformed pipe fits snugly into, and follows closely, the contours of the existing (host) pipe. The work also involves the reconnection of the existing sewer service property connections and television inspection of the lined pipeline.

**Designated Manhole (s):** Manholes identified by Engineer to be assessed.

**Drop Pipe:** The pipe that vertically connects the upstream sewer conduit to the invert of the through flow channel in a manhole. The drop pipe is strapped to the inside of the manhole, or surrounded in concrete if immediately outside the manhole.

**Float:** Float or slack time associated with one chain of activities is defined as the amount of time between earliest start date and latest start date or between earliest finish date and latest finish date for such activities, as calculated as part of the accepted Schedule Submittal.

**Flow bypass:** The transfer of flow from an upstream section or segment of sewer to the same sewer downstream (generally downstream of the section being rehabilitated) via temporary piping. Generally flow bypass and diversion pumping may be described as the efficient and effective installation and operation of bulkheads, plugs, hoses, piping, and pumps to maintain sewage flow and prevent backup, spillage, flooding or overflow.

**Flow diversion:** The transfer of sewage from an upstream section or segment of the originating sewer to another sewer. The flow is generally not returned to the originating sewer but may in some cases be transferred to another service area. Generally flow bypass and diversion pumping may be described as the efficient and effective installation and operation of bulkheads, plugs, hoses, piping, and pumps to maintain sewage flow and prevent backup, spillage, flooding or overflow.

**Fold and Form Pipe:** A pipe rehabilitation system in which the plastic pipe (either PVC or HDPE) is manufactured in folded shape of reduced cross-sectional area and is pulled into an existing sewer and subsequently expanded with pressure and heat. The reformed pipe fits snugly into and follows closely the contours of the existing (host) pipe.

**HDPE Liner:** The high density polyethylene (HDPE) pipe or sheeting that is used to renovate sewer conduits subject to structural and corrosive defects.

**Hobas Pipe:** Proprietary Glass Fiber Pipe used for sewer conduit renovation purposes.

**Invert:** The internal elevation at the bottom of the sewer (see also **Soffit, Crown**).

**Joints:** The means of connecting sectional lengths of sewer pipe into a continuous (flexible jointed or articulated) sewer line using various types of jointing materials. The number of joints depends on the lengths of the pipe sections used in the specific sewer construction work. See pipe manufactures catalogue.

**Junction:** A factory-made tap.

**Junction Box:** A subsurface structure normally constructed in reinforced concrete in which two or more sewer conduits meet.

**Lateral:** Building or house service connection to sewer or sewer to sewer connection.

**Lining:** (n) Also termed "insitu lining," is an internal lining material applied to the wall of an existing sewer for structural and/or protective reasons. (v) Active renovation (i.e., by insertion) of a prefabricated lining into an existing sewer.

**Manhole:** A subsurface structure in which two or more pipes meet, with person access from the ground surface.

**Manhole Structure:** Reference to and all activities relevant to manhole structures throughout the text shall also be taken to include junction boxes, inspection chambers, drop shafts, sumps, and all other auxiliary structures appurtenant to the sewerage system.

**Mapped Manhole:** A manhole that appears on the City's sewer system map. A mapped manhole may or may not be designated for assessment.

**Cured-In-Place Pipe (CIPP):** A system by which a burster unit splits the existing pipe while simultaneously installing a new polyethylene pipe. The new pipe may be of the same size or larger size. The work also involves the reconnection of the existing sewer service property connections and television inspection of the polyethylene pipe.

**Raised manhole:** *A manhole in which the cover and frame are above normal levels above ground, i.e., more than 30-inches above ground level. A raised manhole may or may not be designated for assessment.*

**Schedule of Record:** The Schedule of Record will be the Official Project Schedule for this Contract. All updates and/or revisions relating to coordinating the Work, scheduling the Work, monitoring the Work, reviewing the progress payment requests, evaluating time extension requests, and all other objectives shall be made to this Schedule. No other schedule will be recognized for this Contract.

**Sewer Inspection:** Viewing the sewer pre- or post preconditioning and/or pre-or post rehabilitation with the aid of CCTV and/or sonar equipment, and/or manually, to assess overall condition. No data logging is required.

**Sewer Survey:** Viewing the sewer with the aid of CCTV and/or sonar equipment, and/or manually, to assess internal structural and/or service condition as well as assess the structural and/or service condition of laterals. Data logging is required.

**Soffit:** The internal elevation at the top of the sewer (see also **Crown, Invert**).

**Stream crossing:** A temporary structure installed across a perennial or nonperennial stream or watercourse for use by construction equipment. Stream crossing shall be in accordance to detail in the Contract Drawings and the Georgia Erosion and Sedimentation Act of 1975 and its amendments.

**Tap (Connection):** Factory tap, break-in/hammer tap or saddle connection of lateral sewer to another sewer.

**Through Flow Channel:** The channel that passes sewage directly through the (concrete) manhole base from the upstream sewer to the downstream sewer, also called the manhole invert.

**T-Lock:** HDPE sheeting used specifically for protecting sewer conduits against corrosion.

**Unburied Manhole:** *A manhole on a sewer to be assessed formerly buried below ground surface. An unburied manhole may or may not be designated for assessment*

**Unmapped Manhole:** A manhole not included on the City's sewer system map. An unmapped manhole is also known as an uncharted manhole.

**Wet Well:** The wet side or inlet side of a wastewater pumping station.

## **Sewers - General**

**Abrasion:** Hydraulic wear or scour on the wall of a sewer, through-flow channel or manhole wall.

**Above Ground Sewer (Aerial Sewer):** An unburied sewer (generally a sanitary sewer), supported on piers, pedestals or bents to provide a suitable grade line.

**Aggressive:** A property of the sewage conveyed that results in accelerated corrosion of the conveying sewer conduit.

**Building Sewer:** The conduit that connects building wastewater sources to the public or street sewer, including lines serving homes, public buildings, commercial establishments and industry structures. Referred to also as house sewer, building connection, service connection or lateral connection.

**Cleaning:** Techniques used to clean sewer lines either hydraulically or mechanically. *Hydraulic cleaning* involves using water, such as water pumped at a high velocity spray and water flowing by gravity or head pressure. Devices include high-velocity jet cleaners, cleaning balls (or pigs) and hinged-disc cleaners. *Mechanical cleaning* includes methods utilizing rodding machines, bucket machines, kites, winch-pulled brushes and wheelbarrows with spades.

**Collector Sewer:** A sewer located in the public way that collects wastewater discharges through building sewers, and conducts such flows to larger interceptor sewers, lift stations and treatment works.

**Combined Sewer:** A sewer that is designed to serve as both a sanitary sewer and a storm sewer.

**Conduit:** A pipe or other opening, buried or above ground, for conveying hydraulic traffic, pipelines, cables or other utilities.

**Core Area:** That essential part of a sewer network containing critical sewers and other sewers where hydraulic problems are likely to be most severe, and that require detailed definition within a flow simulation model.

**Corrosion Rate:** The rate (usually an average) at which corrosion of a component of the wastewater network progresses; expressed as though it were linear in units of mdd (millimeters per square decimeter day) for weight change, or mpy (millimeters per year) for thickness changes.

**Corrosion Resistance:** Ability of a material to withstand corrosion within the wastewater network.



**Creep:** The dimensional change, with time, of a sewer renovation material (lining) under continuously applied stress after the initial elastic deformation.

**Critical Sewers:** The major sewers in a wastewater network that would exhibit the most significant consequences in the event of structural collapse.

**Critical Soils:** Appraisal of the nature of soils surrounding sewers. Soils of *High-Criticality* are composed of silts and sands. Those of *Medium-Criticality* consist of low plasticity clays and gravel. Soils of *Low-Criticality* consist of medium to high plasticity clays and all clays where the sewer was constructed in tunnel.

**Deflection:** Reduction in vertical diameter and/or distortion in shape of a conduit as a result of self-weight or external forces.

**Degradation:** Breakdown in chemical resilience of a plastic product.

**Effluent:** Outflow or discharge from a sewer or wastewater treatment product.

**Elastic Modulus:** Characteristic of the stress build-up associated with a given strain in a conduit or lining (see also **Flexural Modulus**). Typically a feature of the strength characteristics of lining materials in sewers.

**Elongation:** The increase in length of a material stressed in tension.

**Embrittlement:** Loss of ductility of a material, resulting from a chemical or physical change.

**Environmental Stress Crackling:** The visible manifestation of a material's susceptibility to crack under the influence of specific chemical or mechanical stresses.

**Epoxy:** Resin formed by the reaction of bisphenol and epichlorohydrin.

**Erosion:** Deterioration of the surface of a component of the wastewater system resulting from the action of harder material suspended in sewage on the wastewater component.

**Exfiltration:** The leakage or egress of sewage from the wastewater system into the surrounding area, usually the ground, through leaks in pipes, joints, manholes, or other sewer system structures and components; the reverse of infiltration.

**External Structural Condition:** Appraisal of a length of sewer between manholes in to identified external forces (e.g., from traffic load if less than 4 feet below highway; ground water pressure if below the water table, etc.) and nature of ground (e.g., soil criticality, chemical inertness, etc.).

**Flexural Modulus:** The slope of the elastic strain curve defined by flexural load versus resultant strain. A high flexural modulus indicates a stiffer material.

**Flexural Strength:** The strength of a material in bending expressed as the tensile stress of the outermost fibers at the instant of failure.

**Flow Attenuation:** The process of reducing the peak flow rate in a sewer system by redistributing the same volume of flow over a longer period.

**General Corrosion:** Uniform corrosion, usually a phenomenon observed above the flow line in the sewer.

**Ground Water Table (Level):** Upper surface of the zone of saturation in permeable strata. Of special relevance to sewer survey or inspection if immediately above or below the sewer. The sewer is more susceptible to ground water infiltration if above the sewer. (See also **Ground Water Infiltration**).

**Grout:** (1) A fluid mixture typically consisting of cement, water and sand that can be poured or pumped easily. (2) Chemical mixtures that have the capability of stopping water infiltration through small holes and cracks in sewers and manholes.

**Grouting:** (1) The joining together of loose particles of soil in such manner that the soil so joined becomes a solid mass impervious to water. (2) The process of introducing (typically by pumping) a cement and water grout into the annular space between a host pipe and a slipline pipe.

**Header:** All reference data at the head of the coding sheet, other than sewer condition data, attaching to the sewer being inspected.

**Hydraulic Gradient:** An imaginary line through the points to which water would arise in a series of vertical tubes connected to the sewer.

**Hydrogen Sulfide Corrosion:** Hydrogen sulfide corrosion is the attack of cementitious materials caused by the microbiological conversion of sulfates within sewage to gaseous sulfides and then to sulfuric acid. The corrosion causes a reduction in the sewer wall thickness and a loss of structural integrity.

**Infiltration:** See **Ground Water Infiltration**.

**Infiltration/Inflow (I/I):** Pertaining to the study and understanding of the undesirable ingress of infiltration and inflow into the wastewater system.

**Inflow:** The rain-induced water entering the sewerage or wastewater system from areas not intended to drain to the sewerage or wastewater system. Inflow is thus distinguished from infiltration. (See also **Ground Water Infiltration**).

**Interceptor Sewer:** A sewer that receives flow from collector sewers and conveys the wastewater to treatment facilities.

**Internal Condition Grade (ICG):** The relative state of the internal service or structural performance of the sewer in relation to specified criteria. In broad structural terms, it is a measure of the sewer's probability to collapse.

**Internal Sewer Service Condition:** The ability of a length of sewer between manholes to perform its intended function of conveying sewage, determined by the degree of non-structural defects within the sewer.

**Man Entry Sewers:** Those sewers considered to be large enough for safe manual (physical) inspection, survey and work activities (e.g., manual renovation and repair). Generally considered to be greater than 1,000 millimeters (around 40 inches) in size. Safety considerations are important before contemplating and undertaking such a survey.

**Manholes Length, Section or Segment:** The length of sewer between two adjacent manholes.

**Non-Man Entry Sewers:** Those sewers considered to be too small for manual inspection, survey and work activities (e.g., renovation and repair). Generally considered to be less than 1,000 millimeters (around 40 inches) in size. Normally, these sewers are inspected and surveyed using CCTV, and repairs are carried out robotically.

**Non-uniform Corrosion:** Corrosion that attacks small, localized areas of the sewer, usually resulting in material loss. Characteristic of poorly made non-uniform concrete.

**Overflow:** (a) The excess water that flows over the ordinary limits of the sewer, manhole, or containment structure. (v) An outlet, pipe, or receptacle for excess water.

**Oxidation:** Loss of electrons, as when metal goes from the metallic state to the corroded state.

**pH:** A measure of the acidity or alkalinity of sewage, expressed as the logarithm, base 10, of the inverse of the hydrogen ion concentration (the weight of the hydrogen ions multiplied by the activity coefficient, which is close to unity in most fresh waters and in other waters of relatively low ionic strength). Most aqueous solutions have pH values in the range 0-14, with pure water (which is neutral) having a pH value of 7. Values above or below 7 indicate alkalinity or acidity, respectively.

**Pipeline:** An alternative definition of a length of sewer that exists as a single branch within the wastewater network. It consists of many pipes and extends from manhole to manhole.

**Pipe Sealing:** Sealing of existing circumferential pipe crack or pipe joint using grouting materials under air pressure.

**Pipe Repair:** Repair of fracture, break or longitudinal crack or fracture in a pipeline by manual (in Man entry sewers) or robotic (in Non-man entry sewers) structural repair techniques.

**Pitting**: Localized corrosion resulting in deeper penetration of the concrete surface in only a few spots.

**Pitting Factor**: Depth of the deepest pit divided by the average penetration calculated from weight loss.

**Sanitary Sewer**: A sewer intended to carry only sanitary or sanitary and industrial wastewater from residences, commercial buildings, industrial parks, and institutions.

**Scaling**: Thin layer of deposit or remnant of sewer material observed during the course of inspection/ survey.

**Serviceability of the Sewer or Sewer System**: Continued service life with high degree of confidence that failure will not occur during its long-term service.

**Sewer**: An underground conduit designed to carry wastewater. A sewer can take the form of a pipe or tunnel and can be of many shapes (e.g., circular, ovoid, u-shaped, rectangular, oval, etc.) and materials (e.g., concrete, asbestos cement, truss, clayware, brick, steel, cast iron, etc.). Sewers convey either storm water or wastewater.

**Sewer Infiltration**: See **Infiltration**.

**Sewer Inflow**: See **Inflow**.

**Sewer Inspection**: Viewing the sewer primarily with the aid of sewer CCTV equipment, and or manually, to assess overall condition. No data logging is required. Inspection is normally carried out as an adjunct to other activities in the sewer such as preparatory cleaning or pre/post renovation measures. (See also **Sewer Survey**).

**Sewer Structural Condition**: Assessment of the structural integrity of the sewer.

**Sewer Service Condition**: Assessment of the service condition of the sewer, reflecting the sewer conduit's capacity, potential for blockage, and water tightness.

**Sewer Springings**: The imaginary points on the wall of the sewer at the ends of the horizontal diameter. Normally considered to be the position where the arch, or top half, of the sewer commences.

**Sewer Survey**: Viewing and appraising the sewer with the aid of:

Internally:

- *Sewer CCTV equipment*, and/or manually to assess internal structural and/or service condition of the sewer (as well as assess the structural and/or service condition and location of laterals). Data logging is required and the depth of flow is not more than 25 percent of the vertical dimension of the sewer;

- *Sewer profiling equipment*, to establish the dimensional configuration of the sewer (including percentage deformation). Flow is normally bypassed;
- *Sonar equipment*, when the sewer is flooded or partially flooded to assess internal structural and/or service condition of the sewer (as well as assess the structural and/or service condition and location of laterals). Data logging is required, though not with the same resolution as with CCTV;
- *A combination of sonar and CCTV equipment*, when the depth of flow is between 25 percent and 75 percent in sewers larger than 18 inches; and/or
- *Thermographic sensor-equipment*, to determine the position of laterals in lined sewers.

Externally:

- Ground probing radar antennae, to assess external conditions (e.g., voids) immediately relating to the sewer;
- Seismic resonance testing equipment, to assess stratification and nature of the ground between the ground surface and the sewer; and/or
- Such other equipment that provides insights into the nature of the sewer and its surrounding conditions.

A sewer survey normally forms the basis of an engineering interpretation of the internal condition of the sewer (see also **Sewer Inspection**).

**Springing:** See also **Sewer Springing**.

**Standard Dimension Ratio (SDR):** Ratio of the pipe diameter to wall thickness.

**Surcharge:** Occurs and is witnessed when the sewer flow exceeds the hydraulic capacity of the sewer line.

**Uniform Corrosion:** Corrosion that results in an equal amount of material loss over an entire sewer surface

## **ATTACHMENT B**

# **INTERNAL SEWER CONDITION ASSESSMENT SAMPLE REPORTS**

**(For use with City of Atlanta Database)**

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Terrell Creek Trunk System Sewer Improvements  
Section 02752 – Internal Sewer Condition Assessment

< SURVEY REPORT >		Page Number : 167 >	
Date : 02 05 2000		Time : 10:28	
Contractor	Contract No	Job No	Drainage Area
ASI/DG	ASG/0001	0	0
Div Dist	Pipe L. Ref		
0 000	23250201501X		
Location		Place Name	
BERKELE STREET		MCDANIEL BASIN	
Start Manhole No. :	23250201001	Depth :	08.0
Finish Manhole No. :	23250201501	Depth :	09.0
Total Length :	365.0		
Suved Length :	280.7		
Use	Direction	Size	Shape
COMBINED	UPSTREAM	8in	CIRC.
Material	Lining	Yr Laid	Pipe L
U. CLAY		2	3.00
CD-ROM No	U. Model	Comments	
00016		-	
Purpose	Weather	Location	Further Information
	DRY		-

< DETAIL >		Page Number : 167 >	
Digit Ph.	Dist CD Code	Other Details	

0136	0.0	ST	Start of Survey	[0065]
0280	0.0	MH	Manhole 23250201001	
0560	0.0	WL	Water Level is now 05%	
0163	30.2	JN	Junction. 6in at 03o/c	FW
0180	41.6	JDM	Joint Displaced Medium	
0186	43.3	JN	Junction. 6in at 09o/c	SW
0200	54.6	OJM	Open Joint Medium	
0203	56.3	JN	Junction. 6in at 09o/c	SW
0226	79.0	JN	Junction. 6in at 03o/c	FW?
0236	83.2	JN	Junction. 6in at 09o/c	FW
0260	106.5	JN	Junction. 6in at 02o/c	FW?
0270	108.5	JN	Junction. 6in at 09o/c	FW
0286	120.9	CNI	Conn. Intruding by 1in. 6in Dia at 12o/c	FW
0303	135.4	CL	Longitudinal Crack at 12o/c	
0310	136.0	CNI	Conn. Intruding by 1in. 6in Dia at 12o/c	FW?
0326	147.2	JN	Junction. 6in at 03o/c	FW
0333	149.8	JN	Junction. 6in at 09o/c	SW
0346	157.5	JN	Junction. 6in at 03o/c	SW
0366	175.9	JN	Junction. 6in at 10o/c	SW
0376	181.0	JN	Junction. 6in at 02o/c	FW?
0386	184.9	JN	Junction. 6in at 10o/c	SW
0780	184.9	S1 DES	Debris Silt. 05% loss	
0416	209.3	JN	Junction. 6in at 10o/c	FW?
0840	209.3	F1 DES	Debris Silt. 05% loss	
0433	218.9	JN	Junction. 6in at 02o/c	SW
0453	234.2	JN	Junction. 6in at 10o/c	SW
0470	244.8	FCJ	Circumferential Fracture at Joint at 03 to 05o/c	
0483	254.7	JN	Junction. 6in at 02o/c	FW?
0970	254.7	S2 DES	Debris Silt. 05% loss	
1940	254.7	S3 RF	Fine Roots	
0490	257.5	JN	Junction. 6in at 09o/c	SW
0513	279.5	C2 DES	Debris Silt. 50% loss	
0520	280.6	JN	Junction. 6in at 02o/c	SW

DETAIL CONTINUED ON NEXT PAGE	For Page Number : 167
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< CONTINUATION PAGE >		Page Number : 167 >
Location BERKELE STREET	Place Name MCDANIEL BASIN	
Start Manhole No. : 23250201001	Depth : 08.0	Total Length : 365.0
Finish Manhole No. : 23250201501	Depth : 09.0	Suyed Length : 280.7

< DETAIL CONTINUED >		Page Number : 167 >
Digit Ph.	Dist CD	Code Other Details

0523      280.7 F2 DES Debris Silt. 50% loss  
 1050      280.7 F3 RF Fine Roots  
 0523      280.7 SA Survey Abandoned DUE TO SURVEY OVERLAP

< SUMMARY >		Page Number : 167 >										
St Mh No. : 23250201001	Fh Mh No. : 23250201501	Suyed Length : 280.7										
SOME MAJOR defects in this length : Deformations : NO												
<table border="0" style="width: 100%;"> <tr> <td colspan="2" style="text-align: center;">Mult/Long/Circ Heavy/Medium Gusher/Runner Mass</td> </tr> <tr> <td>Breaks/Holes</td> <td>Fractures</td> </tr> <tr> <td>NO</td> <td>NO</td> </tr> <tr> <td colspan="2" style="text-align: center;">CIRC</td> </tr> <tr> <td colspan="2">Faulty Junctions/Connections : YES</td> </tr> </table>			Mult/Long/Circ Heavy/Medium Gusher/Runner Mass		Breaks/Holes	Fractures	NO	NO	CIRC		Faulty Junctions/Connections : YES	
Mult/Long/Circ Heavy/Medium Gusher/Runner Mass												
Breaks/Holes	Fractures											
NO	NO											
CIRC												
Faulty Junctions/Connections : YES												
< END OF SUMMARY >												

Terrell Creek Trunk System Sewer Improvements  
Section 02752 – Internal Sewer Condition Assessment

< SURVEY REPORT > < Page Number : 170 >						
Date : 02 05 2000				Time : 17:20		
Contractor	Contract No	Job No	Drainage Area	Div Dist	Pipe L. Ref	
ASI/DG	ASG/0001	0	0	0 000	23250200401X	
Location			Place Name			
MCDANIEL STREET			MCDANIEL BASIN			
Start Manhole No. :		23250201901	Depth :	09.6	Total Length :	085.8
Finish Manhole No. :		23250200401	Depth :	08.0	Suyed Length :	085.8
Use	Direction	Size	Shape	Material	Lining Yr Laid	Pipe L
COMBINED	UPSTREAM	12in	CIRC.	U. CLAY	2	3.00
CD-ROM No	U. Model	Comments				
00016		-				
Purpose	Weather	Location	Further Information			
	DRY		-			

< DETAIL > < Page Number : 170 >			
Digit Ph.	Dist	CD Code	Other Details

0683	0.0	ST	Start of Survey	[0341]
1370	0.0	MH	Manhole 23250201901	
1940	0.0	WL	Water Level is now 05%	
0683	0.0	S1 DEG	Debris Grease at 07o/c to 05o/c. 05% loss	
0693	13.9	JDM	Joint Displaced Medium	
0700	18.3	OB	Obstruction. 05% loss STONE	
0710	26.3	S2 DES	Debris Silt. 05% loss	
0720	35.4	CXI	Conn Defect/Intr. by 3in. 6in Dia. At 10o/c SW	
1440	35.4	JN	Junction. 6in at 02o/c CAPPED OFF	
0736	40.5	JN	Junction. 6in at 02o/c CAPPED OFF	
0750	46.6	C2 DES	Debris Silt. 15% loss	
0766	60.9	JN	Junction. 6in at 10o/c CAPPED OFF	
0783	73.7	JX	Junction. Defective. 6in Dia at 02o/c SW	
1570	73.7	B	Break. From 11o/c to 01o/c	
0796	81.1	JN	Junction. 6in at 10o/c	
0800	85.8	F1 DEG	Debris Grease at 07o/c to 05o/c. 05% loss	
1600	85.8	F2 DES	Debris Silt. 15% loss	
2400	85.8	MH	Manhole 23250200401	
0800	85.8	FH	Finish of Survey.	

< SUMMARY > < Page Number : 170 >		
St Mh No. :	23250201901	Fh Mh No. : 23250200401 Suyed Length : 085.8
SOME MAJOR defects in this length : Deformations : NO		
Mult/Long/Circ Heavy/Medium Gusher/Runner Mass		
Breaks/Holes	Fractures	Encrustation Infiltration Roots Obstructions
YES	NO	NO NO NO YES
Faulty Junctions/Connections : YES		
< END OF SUMMARY >		

Terrell Creek Trunk System Sewer Improvements  
Section 02752 – Internal Sewer Condition Assessment

< SURVEY REPORT >						Page Number : 184 >
Date : 02 07 2000				Time : 14:52		
Contractor	Contract No	Job No	Drainage Area	Div Dist	Pipe L. Ref	
ASI/DG	ASG/0001	0	0	0 000	23350305601X	
Location			Place Name			
GAULT STREET			BOULEVARD BASIN			
Start Manhole No. :	23350305601	Depth :	22.0	Total Length :	501.2	
Finish Manhole No. :	23350315501	Depth :	00.0	Suved Length :	501.2	
Use	Direction	Size	Shape	Material	Lining Yr Laid	Pipe L
COMBINED	D/STREAM	12in	CIRC.	U. CLAY	2	3.00
CD-ROM No	U. Model	Comments				
00017		-				
Purpose	Weather	Location	Further Information			
	DRY		-			

< DETAIL >				Page Number : 184 >
Digit Ph.	Dist	CD Code	Other Details	

0786	0.0	ST	Start of Survey	[0392]
1580	0.0	MM	Manhole 23350305601	
2360	0.0	WL	Water Level is now 05%	
0790	6.0	S1 EMJ	Encrust Med at Jnt. 15% loss at 07o/c to 05o/c CLOCKS VARY	
0800	12.9	EHJ	Encrust Heavy at Jnt. 25% loss at 12o/c to 05o/c	
0810	15.3	IDJ	Infiltration Dripping at Joint at 11o/c to 12o/c	
0816	18.6	EHJ	Encrust Heavy at Jnt. 25% loss at 01o/c to 05o/c	
0823	24.7	CL	Longitudinal Crack at 12o/c	
0830	31.5	FL	Longitudinal Fracture at 12o/c	
0840	43.2	EHJ	Encrust Heavy at Jnt. 30% loss at 07o/c to 05o/c	
0846	46.3	EHJ	Encrust Heavy at Jnt. 25% loss at 07o/c to 05o/c	
1700	46.3	S2 IDJ	Infiltration Dripping at Joint at 12o/c	
2600	46.3	RFJ	Fine Roots at Joint	
0856	50.9	EHJ	Encrust Heavy at Jnt. 50% loss at 09o/c to 03o/c OBSCURING VISION	
0920	87.5	F2 IDJ	Infiltration Dripping at Joint at 12o/c	
0956	147.1	IDJ	Infiltration Dripping at Joint at 12o/c	
0966	161.0	EHJ	Encrust Heavy at Jnt. 25% loss at 09o/c to 03o/c	
1940	161.0	IDJ	Infiltration Dripping at Joint at 11o/c	
3080	161.0	RFJ	Fine Roots at Joint	
0973	166.5	EHJ	Encrust Heavy at Jnt. 25% loss at 08o/c to 12o/c	
0983	171.1	IDJ	Infiltration Dripping at Joint at 11o/c	
0996	194.7	IDJ	Infiltration Dripping at Joint at 11o/c	
1003	202.4	IDJ	Infiltration Dripping at Joint at 01o/c	
1016	213.7	BJ	Break at Joint. From 06o/c to 08o/c	
1026	217.6	IDJ	Infiltration Dripping at Joint at 11o/c to 12o/c	
1033	225.2	IDJ	Infiltration Dripping at Joint at 01o/c	
1050	252.9	F1 EMJ	Encrust Med at Jnt. 15% loss at 07o/c to 05o/c CLOCKS VARY	
1300	252.9	S3 ELJ	Encrust Light at Joint at 07o/c to 05o/c CLOCKS VARY	
1066	286.4	IDJ	Infiltration Dripping at Joint at 12o/c	
1073	296.2	RMJ	Mass Roots at Joint. 30% loss	
1350	296.2	IDJ	Infiltration Dripping at Joint at 02o/c	

DETAIL CONTINUED ON NEXT PAGE	For Page Number : 184
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Terrell Creek Trunk System Sewer Improvements  
Section 02752 – Internal Sewer Condition Assessment

< CONTINUATION PAGE >			< Page Number : 184 >	
Location	Place Name			
GAULT STREET	BOULEVARD BASIN			
Start Manhole No. : 23350305601	Depth : 22.0	Total Length : 501.2		
Finish Manhole No. : 23350315501	Depth : 00.0	Suved Length : 501.2		

< DETAIL CONTINUED >			< Page Number : 184 >	
Digit Ph.	Dist	CD Code	Other Details	

1086	304.2	RMJ	Mass Roots at Joint. 10% loss
1113	349.6	RMJ	Mass Roots at Joint. 65% loss
1130	367.7	RMJ	Mass Roots at Joint. 05% loss
1133	370.7	RMJ	Mass Roots at Joint. 60% loss
1146	375.8	RMJ	Mass Roots at Joint. 05% loss
1150	377.8 S4	RFJ	Fine Roots at Joint
1186	441.6	BJ	Break at Joint. From 09o/c to 12o/c
1193	442.7	B	Break. From 11o/c to 01o/c
1200	444.8	B	Break. From 11o/c to 01o/c
			REPAIRED
1206	446.3	CCJ	Circumferential Crack at Joint at 07o/c to 09o/c
1213	448.5	B	Break. From 10o/c to 01o/c
			REPAIRED
1220	451.8	B	Break. From 11o/c to 01o/c
			REPAIRED
1230	454.7	B	Break. From 10o/c to 12o/c
			REPAIRED
1240	457.2	B	Break. From 10o/c to 12o/c
			REPAIRED
1250	460.3	B	Break. From 09o/c to 01o/c
			REPAIRED
1256	462.1	B	Break. From 10o/c to 01o/c
			REPAIRED
1266	471.9	B	Break. From 11o/c to 02o/c
			REPAIRED
1273	478.5	RMJ	Mass Roots at Joint. 25% loss
1750	478.5	RTJ	Tap Roots at Joint
1346	485.1	RMJ	Mass Roots at Joint. 25% loss
1360	492.7 S5	DES	Debris Silt. 10% loss
1370	501.2 F3	ELJ	Encrust Light at Joint at 07o/c to 05o/c
			CLOCKS VARY
1940	501.2 F4	RFJ	Fine Roots at Joint
3080	501.2 F5	DES	Debris Silt. 10% loss
3760	501.2	MH	Manhole 23350315501
1370	501.2	FH	Finish of Survey.

< SUMMARY >		< Page Number : 184 >		
St Mh No. : 23350305601	Fh Mh No. : 23350315501	Suyed Length : 501.2		
SOME MAJOR defects in this length : Deformations : NO				
Breaks/Holes	Mult/Long/Circ	Heavy/Medium	Gusher/Runner	Mass
YES	LONG	HEAVY	NO	MASS
		MEDIUM		NO
Faulty Junctions/Connections : NO				
< END OF SUMMARY >				

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## **ATTACHMENT C**

### **DEFECT, MATERIAL, SHAPE, AND LINING CODES**

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## DEFECT CODES SORTED ALPHABETICALLY

CONT. DEFECT	CODE	DEFINITION	DIAMETER	CLOCK AT	CLOCK TO	PERCENT / INTRUSION	REMARKS
Optional	<b>B</b>	Broken pipe	N/A	Req'd	Optional	N/A	Optional
N/A	<b>BR</b>	Branch major	Req'd	Optional	N/A	N/A	Optional
Optional	<b>CC</b>	Crack circumferential	N/A	Req'd	Req'd	N/A	Optional
Optional	<b>CL</b>	Crack longitudinal	N/A	Req'd	N/A	N/A	Optional
Optional	<b>CM</b>	Cracks multiple	N/A	Req'd	Req'd	N/A	Optional
N/A	<b>CN</b>	Connection	Req'd	Req'd	N/A	N/A	Enter Connection Material
N/A	<b>CNA</b>	Connection abandoned	Req'd	Req'd	N/A	N/A	Optional
N/A	<b>CNI</b>	Connection, intruding	Req'd	Req'd	N/A	Intr inches	- Enter Connection Material
N/A	<b>CXA</b>	Connection, defective abandoned	Req'd	Req'd	N/A	Intr inches	- Enter Connection Material
Optional	<b>CU</b>	Camera underwater	N/A	N/A	N/A	%	Optional
N/A	<b>CX</b>	Connection defective	Req'd	Req'd	N/A	N/A	Enter Connection Material
N/A	<b>CXI</b>	Connection defective, intruding	Req'd	Req'd	N/A	Intr inches	- Enter Connection Material
Optional	<b>D</b>	Deformed sewer	N/A	N/A	N/A	%	Optional
Optional	<b>DB</b>	Displaced bricks	N/A	Req'd	Optional	N/A	Optional
N/A	<b>DC</b>	Dimension of sewer changes	Req'd	N/A	N/A	N/A	Optional
Optional	<b>DE(J)</b>	Debris (non-silt/grease)	N/A	N/A	N/A	%	Optional
Optional	<b>DEG(J)</b>	Debris grease	N/A	Req'd	Req'd	%	Optional
Optional	<b>DES(J)</b>	Debris silt	N/A	N/A	N/A	%	Optional
Optional	<b>DH</b>	Deformed sewer, horizontal (brick sewers only)	N/A	N/A	N/A	%	Optional
Optional	<b>DI</b>	Dropped invert (brick sewer only)	N/A	N/A	N/A	N/A	Gap ... inches
Optional	<b>DV</b>	Deformed sewer, vertical	N/A	N/A	N/A	%	Optional
Optional	<b>EH(J)</b>	Encrustation heavy	N/A	Req'd	Req'd	%	Optional
Optional	<b>EL(J)</b>	Encrustation light	N/A	Req'd	Req'd	%	Optional
Optional	<b>EM(J)</b>	Encrustation medium	N/A	Req'd	Req'd	%	Optional
Optional	<b>ESH</b>	Scale heavy	N/A	Req'd	Req'd	%	Optional
Optional	<b>ESL</b>	Scale light	N/A	Req'd	Req'd	%	Optional
Optional	<b>ESM</b>	Scale medium	N/A	Req'd	Req'd	%	Optional



Terrell Creek Trunk System Sewer Improvements  
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Optional	<b>FC</b>	Fracture circumferential	N/A	Req'd	Req'd	N/A	Optional
N/A	<b>FH</b>	Finish Survey	N/A	N/A	N/A	N/A	Enter Finish MH Label
Optional	<b>FL</b>	Fracture longitudinal	N/A	Req'd	N/A	N/A	Optional
Optional	<b>FM</b>	Fractures multiple	N/A	Req'd	Req'd	N/A	Optional
N/A	<b>GO</b>	General observation at this point	N/A	N/A	N/A	N/A	Enter reason for general observation
N/A	<b>GOA</b>	General observation Abandonment of a Service Line Survey/Inspection	N/A	N/A	N/A	N/A	Enter reason for general abandonment and "D="
N/A	<b>GP</b>	General photograph number	N/A	N/A	N/A	N/A	Enter reason for general photograph
N/A	<b>H</b>	Hole in sewer	N/A	Req'd	Req'd	N/A	Indicate size of hole
Optional	<b>ID(J)</b>	Infiltration dripper	N/A	Req'd	Optional	N/A	Optional
Optional	<b>IG(J)</b>	Infiltration gusher	N/A	Req'd	Optional	N/A	Optional
Optional	<b>IR(J)</b>	Infiltration runner	N/A	Req'd	Optional	N/A	Optional
Optional	<b>IS(J)</b>	Infiltration seep	N/A	Req'd	Optional	N/A	Optional
Optional	<b>JDL</b>	Joint displaced large	N/A	N/A	N/A	N/A	Optional
Optional	<b>JDM</b>	Joint displaced medium	N/A	N/A	N/A	N/A	Optional
N/A	<b>JN</b>	Junction	Req'd	Req'd	N/A	N/A	Enter Junction Material
N/A	<b>JNA</b>	Junction, abandoned	Req'd	Req'd	N/A	N/A	Optional
N/A	<b>JX</b>	Junction defective	Req'd	Req'd	N/A	N/A	Enter Junction Material and Defect Type
N/A	<b>JXA</b>	Junction defective abandoned	Req'd	Req'd	N/A	N/A	Enter Junction Material and Defect Type
N/A	<b>LC</b>	Lining of sewer changes/starts/finish es	N/A	N/A	N/A	N/A	Enter new lining or material code
N/A	<b>LD</b>	Line of sewer deviates down	N/A	N/A	N/A	N/A	Optional
Optional	<b>LL</b>	Line of sewer deviates left	N/A	N/A	N/A	N/A	Optional
Optional	<b>LN</b>	Lining defect	N/A	Req'd	Req'd	N/A	Optional
Optional	<b>LR</b>	Line of sewer deviates right	N/A	N/A	N/A	N/A	Optional
N/A	<b>LU</b>	Line of sewer deviates up	N/A	N/A	N/A	N/A	Optional
Optional	<b>MB</b>	Missing bricks	N/A	Req'd	Req'd	N/A	Indicate size of hole
N/A	<b>MC</b>	Material of sewer changes at this point	N/A	N/A	N/A	N/A	Enter new material
N/A	<b>MH</b>	Manhole/node	N/A	N/A	N/A	N/A	Enter the Start or Finish MH Label
Optional	<b>MM</b>	Mortar missing medium	N/A	Req'd	Req'd	N/A	Optional

Terrell Creek Trunk System Sewer Improvements  
Section 02752 – Internal Sewer Condition Assessment

Optional	<b>MS</b>	Mortar surface missing	N/A	Req'd	Req'd	N/A	Optional
Optional	<b>MT</b>	Mortar missing total	N/A	Req'd	Req'd	N/A	Optional
Optional	<b>OB(J)</b>	Obstruction	N/A	N/A	N/A	%	Enter the type of obstruction
Optional	<b>OJL</b>	Open joint large	N/A	N/A	N/A	N/A	Optional
Optional	<b>OJM</b>	Open joint medium	N/A	N/A	N/A	N/A	Optional
N/A	<b>PC</b>	Pipe Joint Length changes	N/A	N/A	N/A	N/A	Enter new pipe joint length, in feet
Optional	<b>RF(J)</b>	Roots fine (at joint)	N/A	Req'd	Req'd	N/A	Optional
Optional	<b>RM(J)</b>	Roots mass (at joint)	N/A	Req'd	Req'd	%	Optional
Optional	<b>RT(J)</b>	Roots tap (at joint)	N/A	Req'd	Req'd	N/A	Optional
N/A	<b>SA</b>	Survey abandoned	N/A	N/A	N/A	N/A	Enter Reason for abandoned survey
N/A	<b>SC</b>	Shape of sewer changes at this point	N/A	N/A	N/A	N/A	Enter code for new shape / other pertinent comments
Optional	<b>SSL</b>	Surface damage, spalling large	N/A	Req'd	Req'd	N/A	Optional
Optional	<b>SSM</b>	Surface damage, spalling medium	N/A	Req'd	Req'd	N/A	Optional
Optional	<b>SSS</b>	Surface damage, spalling slight	N/A	Req'd	Req'd	N/A	Optional
N/A	<b>ST</b>	Start of survey	N/A	N/A	N/A	N/A	Optional
Optional	<b>SWL</b>	Surface damage, wear large	N/A	Req'd	Req'd	N/A	Optional
Optional	<b>SWM</b>	Surface damage, wear medium	N/A	Req'd	Req'd	N/A	Optional
Optional	<b>SWS</b>	Surface damage, wear slight at	N/A	Req'd	Req'd	N/A	Optional
Optional	<b>V</b>	Vermin	N/A	N/A	N/A	N/A	Optional
Optional	<b>WL</b>	Water level	N/A	N/A	N/A	%	Optional
Optional	<b>X</b>	Sewer collapsed	N/A	N/A	N/A	%	Optional

## DEFECT CODES SORTED BY TYPE

### Pipe Material Codes:

AK	Alkathene
AC	Asbestos Cement
BR	Brick
CI	Cast Iron
SI	Spun Grey Iron
CMP	Corrugated Metal Pipe
CSB	Concrete Segment Bolted
CSU	Concrete Segment Unbolted
CO	Concrete
CC	Box Culvert
DI	Ductile Iron
GRC	Glass Reinforced Concrete
GRP	Fiberglass
PSC	Plastic / Steel Composition
PE	Polyethylene
PLP	PVC Fold & Form
PVC	PVC
RCP	Reinforced Concrete
RPM	Reinforced Plastic Matrix (Truss)
ST	Steel
VC	Vitrified Clay
PP	Polypropylene
WOD	Wood
PF	Pitch Fiber (Orangeburg)
MA	Masonry
XXX	Other (Comment)
ZZZ	Not Known

### Pipe Shape Codes:

A	Arched,
B	Barrel (Beer Barrel)
C	Circular
E	Egg Shape
H	Horseshoe
O	Oval
R	Rectangular
S	Square
T	Trapezoidal
U	U Shape w/ Flat Top
X	Other (Comments)

**Pipe Liner Codes:**

BL	Bitumin,
CPP	Cure In Place
CL	Cement,
IS	Soft Inversion,
PL	Plastic,
RL	Resin Liner,
XXX	Other,
ZZZ	Not Known

**Pipe Use Codes:**

C	Combined
F	Foul (Sanitary)
S	Surface Water
T	Trade Effluent
W	Watercourse (Culvert)
X	Other (Comment)
Z	Not Known

**Purpose Codes:**

A	Specific problems on sewer system related to structural or service condition
B	Specific problems on sewer system related to infiltration
C	Assessment of complete remedial or renovation works
D	Pre-adoption - normally new sewers for adoption
E	Pre-acceptance - new sewers (direct contract) constructed by sewerage undertakers
F	Sample survey to determine asset condition
G	Associated with future capital scheme including Drainage Area Planning
H	Resurvey for any reason
X	Other (state in Comments)
Z	Not Known

**Location:**

A	Main Road Urban
B	Main Road Rural
C	Lightly Traveled Road
D	Foot Path / Road Shoulder
E	Field
F	Garden
G	Woodlands
X	Difficult Access

**Weather Codes:**

1	Dry
2	Heavy Rain
3	Light Rain
4	Showers
5	Snow

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## **ATTACHMENT D**

### **GENERAL INSPECTION LOGGING REQUIREMENTS**

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### General reporting notes – Header Information

(to be read in conjunction with other related documentation, i.e. Clients Instructions or the Manual of Sewer Condition Classification):

- The Inspection company and the Inspectors name must be entered on the Header.
- The Date and accurate time of the inspection must also be recorded.
- Pipe sizes and shapes must also be recorded.
- **Recheck the accuracy of the Manhole Numbers and Road Names (for Road Names, i.e. 4711 Peachtree Street NE) as these are the “keys” to the whole inspection.**
- The Depth of the Start and Finish Manhole must be entered, but as a minimum, the Start Manhole depth is essential.
- A Total Length from center to center of manholes (Total Length Field) must be entered, either derived from the footage to the finish manhole (when the inspection successfully reaches the finish manhole) or estimated either from the Plan or by striding the length. It is fully understood that, in the case of an SA, the Total Footage is an estimate, **but it must not be the same as the Inspected length if SA.**

If the Finish manhole cannot be found then enter a sensible footage (nominally 300 feet as an example) and NOT the footage of the abandonment. If the Total Length is estimated then just enter the text “Tot Length?” in Comments.

- If a Buried or Unmapped manhole is encountered then the Inspection report MUST finish with the MH / FH codes, and a new Inspection must be started. In the case of an unnumbered manhole being found, the numbering of the Manhole MUST be as advised by the client prior to the start of the Inspection/Contract.

**Do not just make up a number. Update the map by marking the position of the Unmapped Manhole in red and writing its number in red.**

- If the inspection is abandoned from one direction and inspected from the other direction then the inspection from the first direction must be finished using SA **(plus a reason for the Inspection being Abandoned, SA)** and a new Header must be started for the “Reverse Inspection”. Note the reverse inspection by entering a “Y” in the proper field on line 1.
- If the inspection is not going to be carried out from the other Manhole, in the case of an SA, then a Header sheet MUST still be completed as if the inspection was to take place, with the reason for failing to carry out the inspection. **See the separate “No Access Instructions” appended to these guidelines.**
- Determine, prior to starting the contract, from Specification Section 02752, what text (data) must be displayed on the monitor (hence recorded). At the start of each inspection as much information as possibly needs to be recorded.
- **If using VHS tape, the video recorder MUST be set to SP and NOT EP or LP for the best quality** to be achieved especially if the Video is going to be encoded onto CD-ROM



### General reporting notes – Detail Information

- The first three lines of each set of inspection details **must** have the codes ST, MH, and WL. **The Manhole Number must be entered in the Remarks column against the MH code** (this is essential as a number of Data Interrogation packages stores the Header and Detail records separately which are “connected” by an Index. To ensure data integrity, a QC check can be run against the Detail information to confirm that the correct Details are against the relevant Header).

i.e.: **V Digit Dist Code Remarks**  
**02305 0.0 ST**  
**0.0 MH SJ34255521**  
**0.0 WL 10**

- Each line of Detail must have the video digit (V Digit) entered against each code, presented in the following way:
  - The video digits must conform to the National elapsed time based standards (time into the tape) for Video Tape recorders:
    - Always have digits (hmmss).
    - Always right justified and zero filled.
    - The following elapsed time format **MUST** be adhered to, i.e.:  
**02305** is:  
**0** = Number of hours (Zero hours).  
**23** = Number of minutes (23 minutes).  
**0** = Units of 10 seconds each (0 seconds)  
**5** = Units of seconds (5 seconds).
  - Other examples:  
00324 = 3 minutes and 24 seconds into the tape.  
15039 = 1 hour, 50 minutes and 39 seconds into the tape.  
24516 = 2 hours, 45minutes and 16 seconds into the tape.

This method locates the position of the defect/feature into the tape to within a few seconds, which is more than adequate.

- The final detail line for each inspection **MUST** end with a Termination code, either SA (Survey Abandoned) or FH (Survey Finished).

i.e. **24511 76.0F1FL 12**  
**24511 76.0 RMJ 30**  
**24511 76.0 SA DUE TO ROOTS MASS (or DUE TO RMJ)**  
**----- or -----**  
**14956 97.3 D 10**  
**15032 102.9 MH SJ35513464**  
**15032 102.9 FH**

***Each Inspection Report MUST only contain one Inspection hence, in the case of a Survey Abandonment or a buried or unmapped manhole being encountered, a new Header and Detail must be completed.***

***The above are essential for the Validation of the data to take place and to tie the data in with Mapping systems.***

## General reporting notes – Detail Information (Cont'd)

When a defect or feature is encountered, the camera must be stopped just prior to the defect/feature so that it can be clearly seen.

- The defect/feature must be recorded for a sufficient time to enable the engineer to assess the observation without recourse to using the “pause” facility.
- A video digit must be entered against the defect/feature in the format of time elapsed into video tape. The format is :h:mm:ss (explained above).
- If the defect spans for more than 3 feet or is repetitive over a number of joints (i.e. ELJ, Encrustation Light at Joint) then a Start Flag (S1, S2 etc, sequentially up to S9 then SA, SB --- SZ! can be used) can be entered against the code at the start footage. When the defect finishes the appropriate Finish Flag is inserted against the defect at the finish footage and the same Flag number is used to finish the defect off (S1 MUST finish with an F1 and so on). This aids the Rig Manager in reporting repeating defects without having to enter the code at every joint footage or every 3 feet.

**Note: The defect that has the start flag against it can change its position (i.e. a FL or CL) but not its magnitude (i.e. you cannot start with a CL and finish with a FL. You must “close”, or finish, the defect with the appropriate Finish Flag and then start the new defect with an UNUSED (in the current inspection) Start Flag.**

- If the inspection was abandoned (SA), then a reason for the abandonment MUST be entered in the Remarks column against the SA code. The description of the reason for the SA should contain the appropriate defect code that has caused the abandonment (i.e. If due to an intruding connection then the end of the report would read:

```
11025    342.8  CNI  04 11    02
11025    342.8  SA           DUE TO CNI
```

- If you are unsure of the defect magnitude (an FL or CL, for instance) then enter the worst code of the two, with its support information, and then in Remarks enter: CL ??

```
i.e. 00327    301.2  FL      11      CL??
```

- All defects and features MUST have the relevant support data (i.e. JN/CN must have sizes and positions. See Defect Code list for details)

## General Inspection Logging Requirements

(to be read in conjunction with other related documentation, i.e. Manual of Sewer Condition Classification):

The first three lines of each set of survey details **must** have the codes ST, MH, and WL (WL is optional but is important to the City of Atlanta as it directly relates to the sewer flow level at a certain time of day).

The Manhole Number must be entered in the Remarks column against the MH code (this is essential as a number of Data Interrogation packages stores the Header and Detail records separately which are “connected” by an Index. To ensure data integrity, a QC check can be run against the Detail information to confirm that the correct Details are against the relevant Header).

i. e.:

```
0D10230    0.0 ST
0D1        0.0 MH        SJ34255521
0D1        0.0 WL        10
```

Each line of Detail (or as a minimum the first and last Detail lines) must have the video digit entered against each code, presented in the following way:

– The video digits must conform to the National elapsed time based standards (time into the tape) for Video Tape recorders:

- Always four digits (hmms, where s = units of 10 seconds).
- Always right justified and zero filled.
- The following elapsed time format **MUST** be adhered to, i.e.:

0230

0 = Number of hours (Zero hours).

23 = Number of minutes (23 minutes).

0 = Units of 10 seconds each (0 seconds).

Other examples:

0032 = 3 minutes and 20 seconds into the tape.

0244 = 24 minutes and 40 seconds into the tape.

1503 = 1 hour, 50 minutes and 30 seconds into the tape.

2451 = 2 hours, 45minutes and 10 seconds into the tape.

**The final detail line for each survey must end with a Termination code, either SA or FH.**

i.e.

```
0D1    89.0 RMJ    30
0D1    89.0F1JDS
0D10410 89.0 SA    DUE TO ROOTS MASS
----- or -----
0D1    33.0 D      10
0D1    34.9 MH     SJ35513464
0D10670 34.9 FH
```

**Each Survey Report MUST only contain one survey hence, in the case of Survey Abandonment or a buried or uncharted manhole being encountered, a new Header and Detail must be completed. The above are essential for the Validation of the data to take place**

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**DRAFT**  
**CITY OF ATLANTA – INTERNAL CONDITION ASSESSMENT LOG**

CD Volume Label	Contractor/Inspector	Basin Number	Sub Basin Number	Reverse	Spare	PLR		
Date (mmddyy)	Time	Address ( Street Number, NSEW, Name, Type, NSEW, Apt #)					Outfall / Trunk Name	
Start Manhole	Start Depth	Start Cover	Start Invert	Finish Manhole	Finish Depth	Finish Cover	Finish Invert	
Use	Direction	Size 1 Dia/Hght	Size 2 Width	Shape	Material / Lining	Pipe Length	Total Length	Year Laid
Video Name	Spare	Comments						
Purpose	Weather	Location	Location Details				Category Code	Pre-Cleaned

Video No.	Photo.No./S VC.No	Distance	Cont. Defect	Code	Diameter	Circumferential		Percent / Intrusion	Remarks
						Clock At	Clock To		

CD Volume Label

Contractor/Inspector

Date

Time

PLR

Video No.	Photo No.	Distance	Cont. Defect	Code	Diameter	<u>Circumferential</u> Clock At    Clock To		Percent / Intrusion	Remarks

## **ATTACHMENT E**

### **SERVICE LATERAL DOCUMENTATION**



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## Launch From Main:

<b>CD Volume Label</b>	<b>Contractor/Inspector</b>	<b>Basin Number</b>	<b>Sub Basin Number</b>	<b>Reverse</b>	<b>Spare</b>	<b>PLR</b>
PTO1XXAGCT01	AG CT	PTC	01			23260112301

<b>Date (mmddyy)</b>	<b>Time</b>	<b>Address ( Street Number, NSEW, Name, Type, NSEW, Apt #)</b>				<b>Outfall / Trunk Name</b>	
90502	1245	1234		PEACHTREE	RD	NE	

<b>Start Manhole</b>	<b>Start Depth</b>	<b>Start Cover</b>	<b>Start Invert</b>	<b>Finish Manhole</b>	<b>Finish Depth</b>	<b>Finish Cover</b>	<b>Finish Invert</b>
23260112301	6.00			23260123401	6.00		

<b>Use</b>	<b>Direction</b>	<b>Size 1 Dia/Hght</b>	<b>Size 2 Width</b>	<b>Shape</b>	<b>Material / Lining</b>	<b>Pipe Length</b>	<b>Total Length</b>	<b>Year Laid</b>
F	D	8		C	CO	3	70.3	

<b>Video Name</b>	<b>Spare</b>	<b>Comments</b>
00000		

<b>Purpose</b>	<b>Weather</b>	<b>Location</b>	<b>Location Details</b>	<b>Category Code</b>	<b>Pre-Cleaned</b>
B	1	B			N

Video No.	Photo/Svc No.	Distance	Cont.		Diameter	Circumferential		Percent / Intrusion	Remarks
			Defect	Code		Clock At	Clock To		
10020		0.0		ST					
10020		0.0		MH					23260112301
10110	01	22.1		JN	4	12			INSPECTION FROM CLEANOUT
10202	02	35.2		CN	4	11			SVC INSPECT
11030	03	50.6		CN	4	09			SVC INSPECT
11655		70.3		MH					23260123401
11655		70.3		FH					

From Clean Out:

<b>CD Volume Label</b>	<b>Contractor/Inspector</b>	<b>Basin Number</b>	<b>Sub Basin Number</b>	<b>Reverse</b>	<b>Spare</b>	<b>PLR</b>
CCO1XXCECN01	CE CN	CMC	01			23260112301

<b>Date (mmddyy)</b>	<b>Time</b>	<b>Address ( Street Number, NSEW, Name, Type, NSEW, Apt #)</b>					<b>Outfall / Trunk Name</b>
90502	1245	1268		PEACHTREE	RD	NE	

<b>Start Manhole</b>	<b>Start Depth</b>	<b>Start Cover</b>	<b>Start Invert</b>	<b>Finish Manhole</b>	<b>Finish Depth</b>	<b>Finish Cover</b>	<b>Finish Invert</b>
23260112301_01	6.00			23260123401	6.00		

<b>Use</b>	<b>Direction</b>	<b>Size 1 Dia/Hght</b>	<b>Size 2 Width</b>	<b>Shape</b>	<b>Material / Lining</b>	<b>Pipe Length</b>	<b>Total Length</b>	<b>Year Laid</b>
F	D	4		C	VC	3	55	

<b>Video Name</b>	<b>Spare</b>	<b>Comments</b>
00001		

<b>Purpose</b>	<b>Weather</b>	<b>Location</b>	<b>Location Details</b>	<b>Category Code</b>	<b>Pre-Cleaned</b>
B	1	F	=SERVICE LINE=		N

Video No.	Photo/Svc No.	Distance	Cont. Defect	Code	Diameter	Circumferential		Percent / Intrusion	Remarks
						Clock At	Clock To		
10020		0.0		ST					
10020		0.0		MH					23260112301_01 (CO)
10320		55		FH					MAIN LINE REACHED

## **ATTACHMENT F**

### **SEWER1.DAT DATA SPECIFICATION AND EXAMPLE OF SEWER1.DAT DATA FILE**

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## **CCTV data transfer: *Sewer1.Dat* Description and Inspection Guidelines**

### Overview:

*The Sewer1.dat Inspection data transfer format has been in existence since 1984. Sewer1.dat has been developed because the technology available now means that longer lengths are being inspected resulting in the need for higher “numbers” being achieved and longer manhole identifiers are becoming the “norm”. Sewer1.dat reflects these needs.*

*Sewer1.dat is an “open architecture” format and was devised by a UK Government body called WRc to ensure that inspection data could be transferred between many applications and that no one contractor or software supplier had monopoly on inspection data input/interrogation software.*

*Sewer1.dat format basis is derived from the site data input form found in the Manual of Sewer Condition Classification Ver. 2 and 3. without the guideline boxes. Copies of the Manual are easily available. The form has been further customized for the City of Atlanta’s specific needs following the same general format.*

*There are at least 15 specialist software programs around worldwide that accepts this format, and can be imported into ACCESS, Dbase V (with the Sewer1.dat fields properly defined within such applications) and Geographical Information Systems. The specification for the format is “free issue” and devoid of “control characters” that can be found in some bespoke applications/data transfer specs.*

*A number of companies offer a free service to Contractors who wish to export to the Sewer1.dat format from their data handling software to test the correctness of the format and offer advice when necessary.*

To ensure that the data transfer file format is correct the following points are to be adhered to:

- Some Field labels are available for the Contractor’s use for their own purpose. These are labeled “Spare”.
- The file is to be in a standard ASCII text format (i.e. no control characters) therefore each line in the file should be terminated by an ASCII carriage return/linefeed combination i.e. ASCII code 13 followed by ASCII code 10 (the default termination on most text generating programs).
- The maximum line length must not exceed 81 characters including the ASCII termination code, except for Line 1 where the contractor can have their own reference after the 80<sup>th</sup> character. Other information could be added after the last character in each line (except for Line 1) if the software that the data is going into is set up to import this extra data. Line 2, for instance, the position from character 64 to 81 is unused.

- Decimal points must not be in any header field. The Format describes the mask of the field; the Actual Format shows how it should have been originally recorded/reported.
- Each Header line must start with a three character identifier "1Hn", *n* being between 1 and 6. The "1" before the "H" denotes that it is a **Sewer1.dat** specification.
- Each Detail line must start with a three character identifier "1D1". The "1" before the "D" denotes that it is a **Sewer1.dat** specification.
- Decimal points must be in Detail footage.
- N = Numeric ONLY field. If the Format is unspecified then Alpha Numeric characters are acceptable.

## **DATA TRANSFER SPECIFICATION**

		<b>Start Position</b>	<b>Number of Characters</b>	<b>Format/Actual Format -----Or Notes-----</b>
-				
<b>Line 1</b>	"1H1"	1	3	Line Identifier
	CD Volume Label	4	12	As per City Guidelines
	Contractor/Inspector	16	8	*-----Ditto-----
	Basin Number	24	10	*i.e. PTC or PTC-PRC
	Sub Basin Number	34	10	*i.e. 32/33/34
	Reverse		44	1 Indicate Y if reverse setup
	Spare	45	3	For Contractors Use
	PLR	48	17	Upstream Mh No. + X or
	Y			

**\* Specific format and Information supplied by City of Atlanta**

<b>Line 2</b>	"1H2"	1	3	Line Identifier
	Date	4	8	MMDDYYYY
	Time	12	4	hhmm
	Road Name	16	30	Where Upstream Mh
is.**	Place Name	46	20	Local name

**\*\* Specific format and Instructions for completion to be supplied by City of Atlanta**

<b>Line 3</b>	"1H3"	1	3	Line Identifier
	Start Manhole	4	16	
	Start Depth	20	5	(NNNNN) (nnn.nn)
	Start Cover	25	6	(NNNNNN)(nnnn.nn)
	Start Invert	31	6	(NNNNNN)(nnnn.nn)
	Finish Manhole	37 (was 38)	16	
	Finish Depth	53	5	(NNNNN)(nnn.nn)
	Finish Cover	58	6	(NNNNNN)(nnnn.nn)
	Finish Invert	64	6	(NNNNNN)(nnnn.nn)
<b>Line 4</b>	"1H4"	1	3	Line Identifier
	Use	4	1	
	Direction	5	1	Direction of inspection
U/D	Size 1	6	4	(NNNN)(nnnn)
	Size 2	10	4	(NNNN)(nnnn)
	Shape	14	1	
	Material	15	3	
	Lining	18	3	
	Pipe Length	21	4	(NNNN)(nnn.n)
	Total Length	25	5	(NNNNN)*** (nnnn.n)
	Year Laid	30	4	

**\*\*\* Distance between the St. and Fh. Manholes, NOT inspected length unless the inspection was completed where it would be the same as the Inspected length.**

<b>Line 5</b>	"1H5"	1	3	Line Identifier
---------------	-------	---	---	-----------------



	Video Name	4	5	e.g. 00000, 00001, etc.
	Spare	9	10	
	Comments	19	40	
<b>Line 6</b>	"1H6"	1	3	Line Identifier
	Purpose	4	1	
	Weather	5	1	
	Location	6	1	
	Location Details	7	50	
	Category Code	57	1	
	Pre-Cleaned	58	1	
<b>Details</b>	"1D1"	1	3	Line Identifier
	Video Digit.	4	5	(NNNNN)(nnnnn)
	Photo/Svc No. (see Note 2.)	9	4	(NNNN)(nnnn)
	Distance	13	6	(NNNN.N)(nnnn.n)
	CD	19	2	Cont. Defect column
	Code	21	5	
	Diameter	26	4	(NNNN)(nnnn)
	Clock At	30	2	(NN)(nn)
	Clock To	32	2	(NN)(nn)
	<b>*Percentage %</b>	34	2	(NN)(nn)
	<b>*Intrusion</b>	34	4	(NNNN)(nnnn)
	Remarks	38	30	

**\*Note:** The position from character 29 to 32 is a shared field in that there is no defect or feature that would have both Percentage and Intrusion, hence if a Percentage the Start position would be 29 for two characters (99% max), and if an Intrusion the Start position would also be 29 but zero filled (20 inches would be 0020, for instance).

Note 2. In addition to the standard use as described in the Manual of Sewer Condition Classification, this field will also be used to number service connections/junctions in accordance with the attached clarification on CCTV Inspection of Private Service Connections and Junctions.

## Example of Sewer1.Dat Data File on Diskette

```
1H1CC02BXCECN02CECN CMC 02B 13930201601
1H20829200209162731 BLACK FOREST TR SW
1H313930201601 00915 13930201701 01427
1H4FD0008 CCO 004001881
1H5C0003
1H6B1B N
1D100027 0000.0 ST
1D100057 0000.0 MH MANHOLE 13930201601
1D100113 0000.0 WL 05
1D100532 0002.3 JN 000603 MATERIAL CO
1D100942 0005.1 JN 000609 MATERIAL CO
1D101253 0046.0 ELJ 070805
1D101427 0049.6 B 0304
1D101511 0051.4 JN 000603 MATERIAL CO
1D101619 0052.7 JDM 0105
1D101759 0068.5 FL 12
1D101924 0076.2 ELJ 010205
1D102056 0095.9 ELJ 030505
1D102214 0098.8 CX 000611 MATERIAL CO
1D102345 0105.1 JNA 000609 MATERIAL CO
1D102607 0138.3 FL 12
1D102713 0148.3 FL 12
1D102816 0159.6 JN 000603 MATERIAL CO
1D103002 0182.2 JX 000609 MATERIAL CO
1D103127 0188.1 MH MANHOLE 13930201701
1D103151 0188.1 FH
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END OF SECTION

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**SECTION 02757****Point Repair of Sanitary Sewers****PART 1 – GENERAL****1.01 SCOPE**

- A. This Section describes repairs to sections of existing sanitary sewers that require correction of isolated major defects, misalignments or collapses.
- B. External Point repairs include necessary external corrective action by means of open cut trench pipe replacement/renewal construction, both as an independent solution to a specific problem or to facilitate other rehabilitation methods such as pipe-bursting or lining.
- C. Internal Point Repairs include necessary internal corrective action using a short length tightly fitting cured-in-place (CIPP) liner for the local repair of an isolated defect or several adjacent defects that can be encompassed within the material length of an internal CIPP point repair within a sanitary sewer pipeline. The liner shall be smooth, hard, strong, chemically inert and free from blemishes.
- D. Furnish all products and perform all labor necessary to fulfill the requirements of these Specifications.

**1.02 APPLICABLE REHABILITATION METHODS**

- A. This specification applies to the following repair methods, varying only in length and purpose of repair as described below.
  - 1. Pipe Blockage External Point Repair - This rehabilitation method is for correcting a major offset, blockage or other type of restriction of a pipeline that would reasonably impede or prohibit pipe-bursting or push-bursting operations. Pipe Blockage Repair includes excavation, maintaining the trench until the new HDPE piping is in place after pipe-bursting, backfill and site restoration.
  - 2. Sanitary Sewer Sag External Point Repair - This rehabilitation method is for correcting a sag in a mainline so that pipe-bursting, horizontal directional drilling or push-bursting may proceed to line and grade. A Sag Repair means correcting a sag in a segment of pipeline where the lowest point of the "Sag" is subject to ponding that is greater than 25% of the diameter of the pipeline. Sag Repair includes excavation, maintaining the trench until the new piping is installed, backfill and site restoration including disposal of all excavated waste material.

3. External Point Repair - This rehabilitation method is for correcting a defect on a mainline that requires excavation. Pipe defect(s) may include collapsed pipe (>10% deformation), severely broken pipe, major dropped joint, major offset joint, or a severely defective service line connection. This type of repair shall include excavation, replacing a section of pipe up to sixteen (16) linear feet in length; replacing up to one (1) service connection, installation of flexible repair couplings or boots as applicable, backfill, disposal and site restoration

All pipe and fittings furnished for this work must comply with the requirements of Section 02730 of the Contract Documents. The replacement pipe section shall be the same size and material as the existing pipe unless the existing pipe is vitrified clay. In such case, PVC shall be used as the pipe section material unless otherwise directed by the Engineer.

It is the Contractor's sole responsibility to establish elevation and/or survey controls necessary to attain true line and grade for the replacement pipe section for all External Point Repairs. No abrupt deflections in line or grade will be allowed.

4. Internal CIPP Point Repair - This rehabilitation method is for correcting a defect on a mainline that can be rectified internally. Pipe defect(s) may include multiple cracks, fractures, deformed pipe (<10% deformation), minor dropped joint, minor offset joint, or a minor defective service line connection. This type of repair shall include lining a limited section of pipe up to seven (7) linear feet in length. Several internal point repairs may be installed in a single segment (length of sewer between manholes) to be determined by the Engineer.

All pipe and fittings furnished for this work shall comply with the requirements of Section 02730 of the Contract Documents.

- B. Point repairs are made at specific locations and involve relatively short lengths of sewer. Isolation of affected reaches of sewer, by plugging and/or bypass pumping if required, shall be performed in accordance with Section 02750 of the Contract Documents.
- C. After each designated Point Repair has been made, the Contractor will perform a CCTV inspection in accordance with Section 02752. The CCTV video and inspection report will be submitted to the City for review. The cost of the CCTV inspection shall be included in the unit price for the Point Repair. If a repaired joint or section should subsequently prove to be defective, the Contractor shall re-perform the work at no additional cost to

the City and shall also be responsible for the costs of any re-inspection required by the City to document the success of the re-work.

- D. Excavation, backfill, resolution of conflicts with other utilities, and miscellaneous work shall conform to the requirements of Sections 02730 and 02200 of the Contract Documents as appropriate.

### 1.03 SUBMITTALS

- A. The Contractor shall submit shop drawings for external point repair pipe material, couplings, CIPP point repair material and delineate staging, traffic control, and access arrangement when the complexity of the repair warrants, as determined by the Engineer and in accordance with Section 01340 of the Contract Documents **(30 Calendar Days before the Point Repair)**.
- B. All internal CIPP point repair submittals shall comply with the related requirements of Section 02520.
- C. Pre installation CCTV inspection reports and videos. Pre installation reports and videos shall be provided no later than 30 calendar days before the point repair installation **(30 Calendar Days before the Point Repair)**.
- D. Post installation CCTV inspection reports and videos. Post installation reports and videos shall be provided within 10 calendar days after the point repair and reinstatement of all laterals **(Within 10 Calendar Days of the Point Repair)**.

## PART 2 – PRODUCTS

### 2.01 PIPE AND PIPE FITTINGS

- A. All pipe and fittings for external point repairs shall be PVC, reinforced concrete pipe (RCP) or ductile iron pipe (DIP) as specified in Section 02730.
- B. All related sections for internal CIPP point repairs, materials, specifications, trial tests, warranty and standards for CIPP point repairs shall comply with the requirements of Section 02520, where applicable with the exception that only epoxy resins shall be used with internal CIPP point repairs.

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- A. The Contractor shall furnish all labor, tools, materials, and equipment necessary for installation and jointing of the pipe. All piping and lining shall be installed in accordance with the Contract Documents in a neat workmanlike manner and shall be set for accurate line and elevation. All piping shall be thoroughly cleaned before installation, and care shall be taken to keep the piping clean throughout the installation.

### **3.02 PREPARATION**

- A. Flow Control: Flow control shall be exercised as required to ensure that no flowing sewage comes into contact with sections of the sewer under repair or replacement in accordance with Section 02750 of the Contract Documents.
- B. Preconditioning and Cleaning (Manholes and) Sewer – Prior to installation of the CIPP point repair the entire sewer shall be preconditioned and cleaned in accordance with the requirements of Section 02511. Installation of CIPP point repair shall not proceed without the Engineers written permission.
- C. The engineers permission to proceed will be contingent on the acceptance of an internal condition assessment video of the prepared sewer to confirm that the sewer is free from all debris and inherent conditions that may adversely affect the smooth introduction of the CIPP point repair into the sewer to be repaired. The internal condition assessment shall accurately portray the position of defects and laterals affected by the proposed remediation. Any lateral introduced into the sewer being treated at the location of the CIPP point repair shall be introduced within the middle third of the repair. Internal condition assessment prior and post lining shall be included in the cost of the repair.

### **REQUIREMENTS SPECIFIC FOR THE CONSTRUCTION OF EXTERNAL POINT REPAIRS.**

### **3.03 REMOVAL AND REPLACEMENT OF SEWER**

- A. After the limits of a particular portion of the existing sewer have been established on the ground, operations shall progress generally as follows:

1. Carefully remove or protect surface features in work area. Expose a full section of existing pipe, including the joints at each end. Take adequate precautions not to disturb any other existing underground facilities. Handle all excavated materials as described in Section 02200 of the Contract Documents.
2. That section of pipe to be replaced shall be isolated by plugging and/or bypass pumping as described in Sections 02750 of the Contract Documents, or by any other method proposed by the Contractor and acceptable by the City.
3. After the defect is located and exposed, the defective pipe or fitting shall be removed by cutting each side along lines perpendicular to longitudinal axis of pipe so as to leave "spigot ends" to be connected to replacement pipe and dispose of the existing pipe and concrete encasement, if any.
4. Excavate the trench to a minimum of 8-inches below the proposed pipe bottom, place bedding material in the trench and shape to form continuous uniform support for the pipe barrel.
5. Pipe shall be installed and jointed, normally beginning at its low or outlet end and proceeding upstream, with the bell ends facing upstream toward the direction of flow. Make connections to existing manholes or existing pipe remaining in place. Install wyes or tees, with branches temporarily plugged, to make reconnections to existing service laterals, if any. Complete bedding or encasement and place compacted backfill as necessary to avoid flotation if water should enter the trench. Encasement will only be allowed if the Engineer confirms that future pipe-bursting will not be required.
6. Complete placement and compaction of backfill. For purposes of the external point repair, the material excavated is considered suitable backfill, provided the excavated material meets the requirements of section 02200 for suitable backfill.
7. Restore surface features to at least as good condition as existed before construction began, including landscaping, grass, roadways, driveways and walks.
8. For External Point Repairs only, perform leakage test in accordance with Section 02730.

### **3.04 EXCAVATION AND BACKFILL**

- A. The Contractor shall excavate and backfill in accordance with Section 02200 of the Contract Documents. Under no circumstances shall the Contractor be allowed to remove concrete or asphalt without prior saw



cutting. The saw cutting shall be deep enough to produce an even, straight cut.

### **3.05 LAYING PIPE**

- A. Proper and suitable tools and appliances for the safe convenient handling and laying of pipe shall be used and shall, in general, agree with manufacturer's recommendations. At the time of laying, the pipe shall be examined carefully for defects, and should any pipe be discovered to be defective after being laid, it shall be removed and replaced with sound pipe by the Contractor at his expense.
- B. Upon satisfactory completion of the pipe bedding, a continuous trough for the pipe barrel and recesses for the pipe bells, or couplings, shall be excavated by hand digging. When the pipe is laid in the prepared trench, true to line and grade, the pipe barrel shall receive continuous, uniform support and no pressure shall be exerted on the pipe joints from the trench bottom.
- C. Pipe shall be installed in accordance with the manufacturer's recommendation. Before being lowered into the trench, the pipes and accessories shall be carefully examined and the interior of the pipes shall be thoroughly cleaned of all foreign matter and other methods acceptable to the City.
- D. Lines shall be laid straight and depth of cover shall be maintained uniform with respect to finish grade, whether grading is completed or proposed at time of pipe installation. No abrupt changes in direction or grade will be allowed.
- E. After pipe has been laid, reviewed and found satisfactory, sufficient backfill shall be placed along the pipe barrel to hold the pipe securely in place during the test. No backfill shall be placed over the joints until the test is satisfactorily completed, leaving the exposed joints to view for the detection of visible leaks. Upon satisfactory completion of the test, backfilling of the trench shall be completed.

### **3.06 INSTALLATION OF PIPE**

- A. PVC, RCP and DIP shall be installed in accordance with Section 02730.

### **3.07 PIPE-TO-PIPE CONNECTIONS**

- A. Pipe-to-pipe connections shall be made in accordance with Section 02730 by using flexible banded couplings or adapters, couplings with compression joints in compliance with ASTM C 425.

### **3.08 PIPE-TO-MANHOLE CONNECTIONS**

- A. When a sound pipe stub-out exists from a manhole to which connection is to be made, a pipe-to-pipe connection shall be made as described above. If one is not present or is faulty, an opening shall be cut in the manhole wall and the connection, consisting of a pipe stub-out with an EPDM rubber boot assembly grouted into the opening with non-shrink grout shall be made to form a corrosion resistant, watertight seal. The invert, benches and floor inside the manhole shall be cut and reshaped as necessary.

### **3.09 TELEVISION INSPECTION**

- A. Post Construction CCTV inspection in accordance with Section 02752 of the Contract Documents is required for all Internal and External Point Repairs on sanitary sewers. The post-installation CCTV inspection shall take place as shortly after completion of each section as is feasible, but in no case more than ten (10) calendar days thereafter. The contractor is required to submit the post-installation CCTV videos within ten (10) calendar days of completing the rehabilitation of a segment of the sewer. The repairs shall demonstrate the full and effective rectification of the extant defect and/or obstruction, including infiltration etc., to the complete satisfaction of the Engineer. The Post Construction CCTV inspection is not required for Pipe Blockage Repairs or Sanitary Sewer Sag Repairs performed prior to pipe-bursting or pipe replacement.

### **3.10 TRAFFIC CONTROL**

- A. Refer to Specification Section 01500: Temporary Control of Construction Operations for requirements.

END OF SECTION

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## SECTION 02900

### Landscaping

#### PART 1 – GENERAL

##### 1.01 SCOPE

- A. The Contractor shall provide landscaping and appurtenant work, complete and in place, in accordance with the Contract Documents. All existing landscaping features and products removed or damaged in the performance of the Work shall be restored to original condition or better.
- B. Trees and shrubs removed or damaged in the performance of the Work shall be replaced with plantings of the same species and equivalent diameter-inch.

##### 1.02 DEFINITIONS

- A. The terms "plant material" or "plants" refer to all vegetation, whether trees, shrubs, ground cover, or herbaceous vegetation.
- B. "Quality" refers to structure and form, as evidenced by density and number of canes and branches, compactness, symmetry, and general development without consideration of size or condition. "Standard quality" indicates the least acceptable quality. "Standard quality" plants shall be typical of the species and variety of good average uniform growth, shall be well formed and uniformly branched, and shall have the minimum number of canes indicated, free from irregularities, or shall conform to minimum quality index. Where the number of canes is not specifically stated in describing this grade, the "Horticultural Standards" as adopted by the American Association of Nurserymen shall apply. In such a case, the number of canes and other factors for the appropriate classification under "quality definition" in the Horticultural Standards shall be the Quality Index. Plant material below this standard will be considered "culls" and are not acceptable. Plants shall be nursery grown.
- C. "Specimen" means an exceptionally heavy, symmetrical, tightly-knit plant, so trained or favored in its development and appearance as to be outstanding, superior in form, number of branches, compactness, and symmetry.
- D. "Size" is the factor controlled by dimensions representing height or spread, or both, without consideration of quality or conditions. For

standard quality, a dimension is given for height or container size, or a dimension is given for height as well as container size.

- E. "Height" is usually indicated with a tolerance. The smaller dimension is the minimum acceptable. The larger dimension represents the maximum permissible. The average dimension of all plants shall equal the average of the tolerance figures for each item.
- F. "Condition" is the factor controlled by vitality and ability to survive, thrive, and be comparable with normal plants of the same species and variety in the vicinity at the same season of the year. Plants shall be free from physical damage or adverse conditions that would prevent thriving. "Condition" also sometimes refers to state of growth, i.e., whether "dormant condition" or "growing condition," and this state shall be comparable to plants of similar species in the vicinity for leaves, formation of buds, and the like.
- G. "Cane" means a primary stem which starts from the ground, or close to the ground, at a point not higher than 1/4 the height of the plant.
- H. "Caliper" shall be measured 12 inches above the finish grade or ground, as a guide, or where the trunk appears to form the head of the tree.
- I. "Foliage line" is maximum dimension in case of specimen plants. It measures from ground to lowest part of body of plant.

### **1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS**

A. Federal Specifications:

- 1. FS O-F-241D Fertilizer, Mixed, Commercial

B. Commercial Standards:

- 1. ASTM D 422 Method for Particle-Size Analysis of Soils
- 2. ANSI Z60.1 Nursery Stock
- 3. American Association of Nurserymen, Inc.
- 4. Rules and Grading Provisions

### **1.04 CONTRACTOR SUBMITTALS**

- A. General: Submittals shall be furnished in accordance with General Conditions, Section 28.

B. Product Information:

1. Manufacturer's product information on fertilizer, peat moss, mulch, seed mixtures, sod, and tree paint.
2. Topsoil Analysis Report: A report certified by an analytical laboratory that shows results of analyzing representative samples of topsoil proposed for use. Approval of the report does not constitute final acceptance of the topsoil.

C. Certificate:

1. Certificates shall accompany each delivery stating source, quantity, and type of material. All certificates shall be submitted at the time of delivery.
2. Certificates of inspection of plant material, as may be required by federal, state, or other authorities having jurisdiction, which accompany the shipment, shall be submitted at delivery.

## 1.05 QUALITY ASSURANCE

- A. General: All plants shall be true to type or name as indicated in the Contract Documents and shall be tagged in accordance with standard practice; however, determination of plant species or variety will be made by the Engineer.
- B. All plants shall comply with federal and state laws requiring inspection for plant diseases and infestations.
- C. Inspections will be made by the Engineer or its representative. The Contractor shall request inspection at least 24 hours in advance of the time inspection is required. Inspection is required on the following stages of the Work:
1. During preliminary grading, soil preparation, and initial weeding.
  2. When trees are spotted for planting, but before planting holes have been excavated.
  3. When finish grading has been completed.
  4. When all Work except the maintenance period has been completed.
  5. Final inspection at the completion of the maintenance period.

- D. Plants shall be subject to inspection and approval or rejection by the Engineer at place of growth and upon delivery to the Site at any time before or during progress of the Work based on:
  - 1. Quantity, quality, size, and variety;
  - 2. Ball and root condition; and
  - 3. Latent defects and injuries resulting from handling, disease, and insects.
- E. Plants approved at pre-planting inspection are subject to rejection during planting if found to be defective.
- F. Rejected plants shall be identified as such in an obvious manner, shall be removed from the Site, and be replaced with acceptable plants.

#### **1.06 CLEAN-UP**

- A. Upon completion of all planting operations, the portion of the Site used for a work or storage area by the Contractor shall be cleaned of all debris, superfluous materials, and equipment. All such materials and equipment shall be entirely removed from the Site.
- B. All walks or pavement shall be swept or washed clean upon completion of the Work of this Section.
- C. During the entire Contract period, plant containers that have been cut or removed from plant materials shall be removed from the Site daily.

#### **1.07 MAINTENANCE OF LANDSCAPING PLANTING PRIOR TO ACCEPTANCE OF PROJECT**

- A. General: The Contractor shall be responsible for protecting, watering, and maintaining all planting and irrigation systems until final acceptance of all Work under the Contract.
- B. At time of acceptance of the complete project, the lawn shall be totally established with no bare spots, have been mowed a minimum of 4 times, and the grass shall be at least 1-1/4 to 2 inches in height.
- C. Watering: Trees and shrubs shall be thoroughly soaked after planting and provided with additional water at intervals as necessary to provide for good health and growth of the planting.
- D. Upon completion of lawn seeding, the entire area shall be soaked to saturation by a fine spray. The new planting shall be kept watered by the

sprinkling system existing on the Site during dry weather or whenever necessary for proper establishment of the lawn. Care shall be taken to avoid excessive washing or puddling on the surface and any such damage caused thereby shall be repaired.

- E. Protection: The Contractor shall provide adequate protection to all newly seeded areas, including the installation of approved temporary fences to prevent trespassing and damage, as well as erosion control, until the end of the correction of defects period.
- F. The Contractor shall replace any materials or equipment or which its employees or Subcontractors have damaged.
- G. Partial utilization of the project shall not relieve the Contractor of any of the requirements contained in the Contract Documents.
- H. Mowing of Lawn Areas: First mowing of lawn areas shall begin as soon as the grass has reached a height of 3 inches and subsequent mowing shall be at least once a week, or as often as necessary to maintain all lawn areas at a uniform height of 1-1/2 to 2 inches.
- I. All lawns shall be fertilized every 3 weeks with 6 lb of 16-16-8 commercial fertilizer per 1000 sq ft for the first 7 weeks and be fertilized thereafter once each 5 months prior to acceptance.
- J. Plants shall be maintained in a vigorous, thriving condition by watering, cultivating, weeding, pruning, spraying, and other operations necessary. No trees or shrubs will be accepted unless they are healthy and show satisfactory foliage conditions.
- K. All planted areas shall be cultivated at least every 2 weeks and be raked smooth to present a neat appearance, and additional mulch shall be added where necessary.
- L. Maintenance shall include, in addition to the foregoing, cleaning, edging, repairs to stakes, wire, and wrappings, the repair of erosion, and all other necessary work of maintenance. Sidewalks and other paved areas shall be kept clean while planting and maintenance are in progress.
- M. Any existing sprinkler lines broken or disrupted shall be replaced to proper working order prior to work under this Contract and shall be acceptable to the City.

#### **1.08 FINAL INSPECTION AND GUARANTEE**

- A. Inspection of lawns and planting will be part of final inspection under the Contract.



- B. Written notice requesting inspection shall be submitted to the Engineer at least 10 days prior to the anticipated inspection date.
- C. Final acceptance prior to start of the guarantee period of the Contract will be on written approval by the Engineer, on the satisfactory completion of all Work, including maintenance, but exclusive of the replacement of plant material.
- D. Any delay in the completion of any item of work in the planting operation that extends the planting into more than one season shall extend the correction period in accordance with the date of completion given above.
- E. The Contractor shall replace, as soon as weather conditions permit, all dead plants and all plants not in a vigorous, thriving condition, which are noted at the end of the one-year correction period.
- F. Plants used for replacement shall be of the same size and variety as existing plants. Replacement plants shall be furnished, planted, staked, and mulched as indicated for new plants.
- G. All Work under this Section shall be left in good order to the satisfaction of the City and the Engineer, and the Contractor shall, without additional expense to the City, replace any trees, shrubs, etc., which develop defects or die during the one-year correction period.

#### **1.09 MAINTENANCE FOLLOWING ACCEPTANCE OF PROJECT**

- A. Begin maintenance of plantings immediately after each area is planted and continue for the periods required to establish acceptable vegetation, but no less than the following:
  - 1. Seeded lawns: at least 60 days, after date of substantial completion. If seeded in fall and not given full 60 days of maintenance, or if not considered acceptable at that time, continue maintenance during following spring until acceptable lawn is established.
  - 2. Sodded lawns: at least 30 days after date of substantial completion.
  - 3. Trees and shrubs: at least 60 days after date of substantial completion.
- B. Maintain lawns by watering, fertilizing, weeding, mowing, trimming and other operations such as rolling, re-grading, replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.

- C. Re-mulch with new mulch in areas where mulch has been disturbed by wind or maintenance operations sufficiently to nullify its purpose. Anchor as required to prevent displacement.
- D. Replant bare areas with same materials specified for lawns.
- E. Watering: Provide and maintain temporary piping, hoses, and watering equipment to convey water from sources and to keep planted areas uniformly moist as required for proper growth.
- F. Lay out temporary watering system and arrange watering schedule to prevent puddling, water erosion, and displacement of seed or mulch (if any). Lay out temporary watering system to avoid necessity of walking over muddy or newly seeded areas.
- G. Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height. Remove no more than 40 percent of grass leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Time initial and subsequent mowings to maintain following grass height:  
  
Mow grass from 1-1/2 inches to 2 inches high. Do not mow to less than 1-1/2 inches.
- H. Apply second fertilizer application after first mowing and when grass is dry. Use fertilizer that will provide at least 1.0 lb. of actual nitrogen per 1,000 sq. ft. of lawn area.

## **PART 2 – PRODUCTS**

### **2.01 GENERAL**

- A. All landscaping materials for soil conditioning, weed abatement, or planting shall be first-grade, commercial quality and shall have certificates indicating the source of material, analysis, quantity, or weight attached to each sack or container or furnished with each delivery. Delivery certificates shall be given to the Engineer as each shipment of material is delivered. A list of the materials used, together with typical certificates of each material, shall be submitted to the Engineer prior to final acceptance.

## 2.02 TOPSOIL

- A. Topsoil shall be obtained from naturally drained areas and shall be fertile, friable loam suitable for plant growth. Topsoil shall be subject to inspection and approval at the source of supply and upon delivery.
- B. The topsoil shall be of uniform quality, free from subsoil, stiff or lumpy clay, hard clods, hardpan, rocks, disintegrated debris, plants, roots, seeds, and any other materials that would be toxic or harmful to plant growth. Topsoil shall contain no noxious weeds or noxious weed seeds.
- C. The topsoil shall contain at least 6 percent organic matter as determined by loss of weight after ignition of moisture-free samples in accordance with current methods of the Association of Official Agricultural Chemists.
- D. The acidity of the topsoil shall result in soil pH between 5.5 and 7.5. The salinity level shall be less than 3 millimhos/cm.
- E. Clay, as determined by the Bouyoucous hydrometer or by the decantation method, shall not exceed 60 percent of the topsoil material.
- F. Mechanical analysis shall be performed and shall conform to ASTM D 422.
- G. Soil mix for interior plants shall be sphagnum moss or a soil mix furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. The soil mix shall be a mix designed specifically for interior container or potted planting.

## 2.03 FERTILIZER AND ADDITIVES

- A. Fertilizer shall be furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon.
- B. Chemical fertilizers shall be a mixed commercial fertilizer conforming to FS O-F-241D, Type I, with percentages of nitrogen, phosphoric acid, and potash at 5-10-5 or 6-10-4. Fertilizers shall be uniform in composition, dry, and free flowing.
- C. Animal fertilizer shall be well-rotted cattle manure, free from sawdust, shaving, or refuse of any kind, and shall contain not more than 25 percent straw by volume.
- D. Tablets shall be 12 grams each 20-10-5 "**Agriform**," "**Lesslie**," or equal.

- E. Lime shall be dolomitic limestone containing not less than 85 percent of total carbonates. Limestone shall be ground to such fineness that 100 percent will pass a No. 200 sieve.
- F. Agricultural gypsum shall be standard brand agricultural calcium sulfate intended for soil application and shall contain 19 percent combined sulfur.

#### **2.04 PEAT MOSS**

- A. Peat shall be a domestic product conforming to FS Q-P-166E and may be reed peat, sedge peat, moss peat, reed muck, or sedge muck. Moss shall be of horticultural grade (fine shreds).
- B. Sphagnum peat moss shall be good quality baled peatmoss free from injurious materials.

#### **2.05 MULCH**

- A. Mulching material shall be well-rotted sawdust a minimum of 2 years old, pine bark or tan bark, all free of sticks, stones, clay, or other foreign materials. Bark mulch shall be medium chunk size, fortified with 1 percent nitrogen. [Mulch shall consist of 1/3 cattle manure and 2/3 coarse granular sawdust. Mulch shall be composted at least 90 days with added nitrogen and shall be free of weed seed and roots, sticks, lumps, and other foreign matter].
- B. "Silva-fiber" mulch material shall be equal to "Silva-fiber" as manufactured by the Weyerhaeuser Company, Silva Products Department, Tacoma, Washington.
- C. Wood chip mulch in planting beds shall be clean, inexpensive, pulverized shavings, 2-inch minimum to 4-inch maximum length as produced by chipping tree branches or similar means, placed to a depth of 4 inches.
- D. Straw mulch or native hay for a soil/seed stabilizer shall be clean hay or straw applied at a rate of 3 tons per acre. Mulch is to be crimped into soil with a mulch crimper. Spacing on the blades of the mulch crimper shall be 6 inches minimum and 9 inches maximum. Blades shall be sufficiently weighted to penetrate the ground 3 inches.

#### **2.06 PLANT MATERIALS**

- A. Plants shall meet requirements of the Contract Documents and shall be in accordance with the botanical names and applicable standards of quality, size, condition, and type. Plants shall be true to name, genera, species, and variety in accordance with reference publications.

- B. Plant names are defined in "Standardized Plant Names" and "Bailey's Encyclopedia of Horticulture." When a name is not found in either reference, the accepted name used in the nursery trade shall apply.
- C. Plants shall be marked for identification. Each bundle of plants and at least 25 percent of each species and variety of separate plants in any one shipment shall have legible labels securely attached before delivery to the Site.
- D. Trees and shrubs shall be measured while their branches are in their normal position. Height and spread dimensions refer to the main body of the plant and not from branch or root tip to tip. No trees will be accepted with leaders cut or so damaged that cutting is necessary.
- E. All plants shall be symmetrical and shall conform to the size, age, and condition on the Plant List. Exceptions are as follows:
  - 1. Plants larger than indicated on the plant list may be used if approved by the Engineer, but approval of such plants shall not increase the Contract Price. If the use of larger plants is approved, the spread of roots or ball earth shall be increased in proportion to the size of the plant. Bare root plants furnished in size greater than indicated shall be balled and burlapped when required by the Engineer.
  - 2. Where caliper or other dimensions of any plant materials are omitted from the Plant List, it shall be understood that such plant materials shall be normal stock for type listed.
- F. Plants shall be of sound health, vigorous, and free from plant disease and shall be well-branched, shall have full foliage when in leaf, and shall have a healthy well-developed normal root system. Cold storage plants will not be accepted. Plants that are sensitive to shock from elevation change shall be grown for at least 2 years at elevations close enough to the Site to alleviate any plant damage due to such change.
- G. Bare rooted (BR) plants shall have well-developed branch systems and vigorous root systems. They shall be dug to sufficient depth to insure full recovery and development of the plants. Roots of these plants shall be covered with a uniformly thick coating of mud puddled immediately after they are dug.
- H. Balled and burlapped (BB) plants shall have firm, natural balls of earth of diameter not less than that indicated and be of sufficient depth to include all the fibrous and feeding roots. No plant moved with a ball will be

accepted if the ball is cracked or broken before or during plant operations, except on approval of the Engineer.

- I. Roots or balls of all plants shall be adequately protected at all times from sun and drying winds.
- J. Plants indicated to be in marked cans, pots, or other containers on the Plant List shall have been grown in the containers for a minimum of 6 months and a maximum of 2 years. Roots shall fill the containers but show no evidence of being or having been root bound.
- K. Trees shall have straight trunks and all old abrasions and cuts shall be completely callused over. In no case shall trees be topped before delivery.
- L. Plants shall have been transplanted or root-pruned at least once in the 2 years prior to delivery, but plants shall not be pruned immediately prior to delivery except as authorized by the Engineer.

## **2.07 SEED MIXTURES**

- A. Seed shall conform to applicable City, county, state, and federal regulations. Seed shall be mixed by dealer. The Contractor shall furnish dealer's guaranteed germination figure for each variety
- B. Grass seed shall be fresh, clean, new-crop seed, composed of the following varieties mixed in the proportions by weight. Purity and germination percentage shall be the results of testing.

<u>Common Names</u>	<u>Proportion by Weight (percent)</u>	<u>Purity (percent)</u>	<u>Germination (percent)</u>
<b>Type 1:</b>			
Baron Kentucky Blue Grass	100	90	90
<b>Type 2</b>			
Buffalo Grass	33	90	90
Creeping Red Fescue	25	90	90
Fuccinellia	25	90	90
Penn Fine Rye Grass	17	90	90
<b>Type 3:</b>			
Western Wheat Grass	33	90	90
Fairway Crested Wheat Grass	33	90	90
Buffalo Grass	34	90	90

## 2.08 SOD GRASS

- A. Sod shall contain at least 85 percent permanent grass suitable to the climate in which it is to be placed; shall not contain more than 25 percent nursing grass; shall not contain more than 10 percent weed and undesirable grasses, and shall be of good texture, free from obnoxious roots, stones, and foreign materials. The sod shall be cut in 16-inch squares, 16-inch wide strips, 4-ft wide strips, or 4-ft wide squares, uniformly 1-1/2 inches thick with clean cut edges.
- B. The sod shall be nursery grown Kentucky Bluegrass sod. It shall be uniformly cut approximately 3/4-inch or more thick and shall be well rooted, 2-year old growth of permanent and desirable grasses indigenous to this general location. The sod shall be practically free from weeds and undesirable grasses.

## 2.09 WOOD EDGING

- A. Wood edging shall be 2-inch x 4-inch redwood construction heart stock.

## 2.10 STAKING MATERIALS

- A. Stakes for supporting trees shall be sound No. 2 redwood of uniform size not less than 2-inch x 2-inch or 2-1/2-inch min diameter wood posts of lengths on the staking details. All knots shall be solid. Alternatively,

stakes may be galvanized iron pipe, 1-inch (ID) diameter with 2 coats of olive green flat enamel paint

- B. Hose for covering wire shall be new or used black or green 2-ply fiber-bearing garden hose, not less than 1/2-inch inside diameter.
- C. Wire for tree bracing and guying shall be double strand pliable No. 10-gage galvanized steel wire or vinyl-coated steel wire.
- D. Tree ties of other materials may be used with prior approval of Engineer.

## **2.11 MISCELLANEOUS MATERIALS**

- A. Wrapping material for trees, 2-inch diameter or larger, shall be 2 thicknesses of crinkled paper cemented together with bituminous material in strips 4-inch wide. Twine for tying shall be medium or coarse sisal yarn with a light impregnation of oil condensate from asphalt or tar.
- B. Soil mix for interior plants shall be sphagnum moss or an approved soil mix furnished in bags or other standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. The soil mix shall be a mix designed specifically for interior container or potted planting.

## **PART 3 – EXECUTION**

### **3.01 GENERAL**

- A. The landscape work shall not be performed at any time when it may be subject to damage by climatic conditions.
- B. Dimensions and plant locations shall be coordinated with Engineer and final location shall be Site-oriented by the planter and Engineer. Any discrepancies or inconsistencies shall be brought to the attention of the Engineer.
- C. Delivery of materials may begin only after samples and tests have been approved by the Engineer. Materials provided shall be not less quality than the approved sample.
- D. The Contractor shall provide temporary fencing, barricades, covering, or other protections to preserve existing landscaping items indicated to remain and to protect the adjacent properties and other structures when they may be damaged by the landscape work.



- E. The Contractor shall retain the services of a tree surgeon approved by the Engineer to repair damage to existing trees. Existing trees, which are to be saved, and which cannot be restored to full growth, as determined by tree surgeon, shall be removed and replaced with a new similar tree of 24-inch box size, unless otherwise approved by the Engineer.
- F. The Contractor shall remove and/or relocate landscape items such as trees, shrubs, grass, other vegetation, improvements, and obstructions as indicated.
- G. Waste materials shall be removed and disposed of off the Site, unless otherwise indicated.
- H. It shall be the responsibility of the Contractor to obtain information regarding utilities in the area of work and to prevent damage to the same. The Contractor shall protect the utilities as necessary.
- I. Burning of combustible materials on the Site shall not be permitted.
- J. The Contractor shall protect structures, sidewalks, pavements, and other facilities that are subject to damage during landscape work. Open excavations shall be provided with barricades and warning lights which conform to the requirements of governing authorities and the state's OSHA safety requirements from dusk to dawn each day and when needed for safety.
- K. Planting areas include all areas to be landscaped, unless indicated otherwise.

### **3.02 SOIL PREPARATION**

- A. The landscape work shall not begin until all other trades have repaired all areas of settlement, erosion, rutting, etc., and the soils have been re-established, re-compacted, and refinished to finish grades. The Engineer shall be notified of all areas that prevent the landscape work from being executed.
- B. Areas requiring grading by the landscaper, including adjacent transition areas, shall be uniformly level or sloping between finish elevations to within 0.10-ft above or below required finish elevations.
- C. The landscape work shall not proceed until after walks, curbs, pavings, edging, and irrigation systems are in place. Work under the Contract shall be completed to a point where the landscape areas will not be disturbed. The subgrade shall be free of waste materials of all kinds.

- D. During grading, waste materials in the planting areas, such as weeds, rocks 2 inches and larger, building materials, rubble, wires, cans, glass, lumber, sticks, etc., shall be removed from the Site. Weeds shall be dug out by the roots.
- E. Fertilizers, additives, seed, peat, etc., subject to moisture damage shall be kept dry in a weatherproof storage place.
- F. After removal of waste materials, the planting area subgrade shall be scarified and pulverized to a depth of not less than 6 inches, and all surface irregularities below the cover of topsoil shall be removed.
- G. Finish grading shall consist of:
  - 1. Final contouring of the planting areas
  - 2. Placing 4 inches of topsoil over all areas to be planted, unless indicated otherwise
  - 3. Placing all soil additives and fertilizers
  - 4. Tilling of planting areas
  - 5. After tilling, bringing areas to uniform grades by floating and/or hand raking
  - 6. Making minor adjustment of finish grades as directed by the Engineer
  - 7. Removing waste materials such as stones, roots, or other undesirable foreign material and raking, disking, dragging, and smoothing soil ready for planting
- H. Any unusual subsoil condition that will require special treatment shall be reported to the Engineer.
- I. Topsoil shall be uniformly distributed over all areas where required. Subgrade and topsoil shall be damp and free from frost.
- J. Surface drainage shall be provided as indicated by shaping the surfaces to facilitate the natural run-off of water. Low spots and pockets shall be filled with topsoil and graded to drain properly.
- K. Finish grade of all planting areas shall be 1½ inches below finish grade of adjacent pavement of any kind.

- L. In all shrub planting areas, 1½ inches of peat moss or soil-aid shall be raked into the top 3 inches of soil.

### **3.03 DELIVERY, STORAGE, AND HANDLING OF PLANT MATERIALS**

- A. No plants other than the required samples shall be dug or delivered to the Site until the required inspections have been made and the plant samples are approved.
- B. Plants shall not be pruned prior to delivery except upon approval by the Engineer.
- C. Plant material shall be planted on the day of delivery if possible. The Contractor shall protect the stock in a temporary nursery at the Site where it shall be protected from sun and drying winds and shall be shaded, kept moist, and protected with damp soil, moss, or other acceptable material. Plants shall be planted within 2 days after delivery.
- D. All balled and burlapped plants which cannot be planted immediately after delivery shall be set on the ground and be well protected with soil, wet moss, or other acceptable material. Bare rooted plants, which cannot be planted immediately, shall be planted in heeled-in trenches immediately upon delivery. No material heeled-in for more than one week may be used. Bundles of plants shall be opened and the plants separated before the roots are covered. Care shall be taken to prevent air pockets among the roots.
- E. During planting operations, bare roots shall be covered with canvas, wet straw, or other suitable materials. No plants shall be bound with wire or rope at any time so as to damage the bark or break branches.
- F. Plants shall not be picked up or moved by stem or branches, but shall be lifted and handled from the sides of the containers.
- G. Plants shall be lifted and handled from the bottom of the ball or container. Plants with balls cracked or broken before or during planting operations will not be accepted and shall be immediately removed from the Site.

### **3.04 TREE AND PLANT LOCATIONS**

- A. The Contractor shall locate and stake all tree and shrub locations and have the locations approved by the Engineer before starting excavation for same. The plant locations shall be observed, and their locations shall be adjusted as directed by Engineer before final approval.

- B. No trees shall be located closer than 72 inches to structures unless otherwise indicated. Ground covers and shrubs may be planted up to structures or curbs.

### **3.05 PLANT PITS**

- A. Plant pits, centered on location stakes, shall be excavated circular pits with vertical sides and flat or saucer shape bottom in accordance with the following sizes, unless indicated otherwise:
  - 1. Tree pits shall be at least 2 feet greater in diameter than the specific diameter of ball or spread of roots, and at least 6 inches below depth of ball or roots. A 3-inch layer of manure shall be worked thoroughly to a depth of 6 inches below the pit bottom.
  - 2. Shrubs shall be planted in pits or holes of soil 24 inches deep below finished grade, or deep enough to properly set the plant at finished grade with a minimum of 6 inches of planting soil under balls of all plants. Shrubs with balls shall be planted in pits that are at least 24 inches greater in diameter than the bottom of ball. Bare root shrubs shall be planted in pits at least 12 inches below the roots of the plant.

### **3.06 PREPARED BACKFILL**

- A. Tree and shrub pit backfilling soil shall consist of 3 parts topsoil, and 1 part peat or soil-aid by volume. Commercial fertilizer shall be sparingly mixed with the prepared topsoil, using 5 lb/cu yd or as required by manufacturer's printed recommendations.
- B. Materials shall be thoroughly rotary-mixed on the Site before placement. Mixing of materials in pits, bins, trenches or beds will not be permitted.
- C. Tree and shrub pits shall be provided with fertilizer tablets as follows:
  - 1. 1 per one-gallon can plant
  - 2. 3 per 5-gallon can plant
  - 3. 5 per 15-gallon can plant

### **3.07 ROCKS OR UNDERGROUND OBSTRUCTIONS**

- A. In the event that rock or underground obstructions are encountered in the excavation of plant pits, alternative locations will be selected by the

Engineer. Moving of trees to alternative locations shall not entail additional costs to the City.

### **3.08 SETTING PLANT MATERIALS**

- A. The soil shall not be worked when the moisture content is so great that excessive compaction will occur, or when it is so dry that a dust will form in the air or clods will not break readily. Water shall be applied if necessary to provide ideal moisture for filling and for planting.
- B. Plants shall be set plumb and straight in center of pits, and at such a level that after settlement that the crown of the plant will be 2 inches above the finished grade.
- C. Balled and burlapped trees shall have planting soil placed and compacted around base of ball to fill all voids. All burlap ropes or wires shall be removed from the sides and tops of balls.
- D. Roots of bare root plants shall be properly spread out and planting soil carefully worked in among them. All broken or frayed roots shall be cut off clean.
- E. Vines shall be removed from stakes, untied, and securely fastened in an approved manner to wall or fence next to which they are planted.
- F. Ground cover plants shall be evenly spaced, staggered in rows, and set at intervals indicated, so as to produce a uniform effect. Plants shall be watered immediately after planting operations have been completed.
- G. Shrubs and vines shall be pruned to remove damaged branches. All bare root shrubs shall be pruned and shaped to compensate for transplant root loss.
- H. Planting soil around roots or balls shall be thoroughly compacted and watered. After planting, the soil in the shrub beds shall be cultivated between shrubs, raked smooth, and neatly outlined. Muddy soil shall not be used for backfilling. All broken or frayed roots shall be properly cut off.
- I. Trees and shrubs on slopes steeper than 6 to 1 shall be provided with watering dams or berms at least 6 inches high and 8 inches wider than planting pit unless indicated otherwise.
- J. Trees shall be thoroughly watered immediately after planting.
- K. Remove all tags and labels when directed by Engineer.

- L. Trees shall have trunks wrapped in acceptable tree wrap material from base up to and above at least the second scaffold branch.

### **3.09 STAKING**

- A. Staking of trees shall be done immediately after planting. Plants shall stand plumb after staking. Staking shall be as indicated.
- B. No balled and burlapped specimen "tree-like" shrubs shall be staked.
- C. Trees of 2-inch caliper and larger shall be guyed at points of branching with 3 wires spaced equally around and outside the perimeter of the ball. Guy wires shall be covered with rubber hose at the bark, protected by approved material at points of contact. Each guy shall be positioned below crotches and fastened to a 4-inch diameter by 18-inch wood deadman, 12 inches below grade. One turnbuckle shall be provided for each guy.
- D. Trees less than 2-inch caliper shall be supported by 2 stakes placed diametrically opposite at perimeter line of ball and to sufficient depth to hold tree rigid. Stakes shall be driven vertically and not twisted or pulled. Trees shall be wired to each stake as indicated on staking details. Trees shall be protected with rubber hose over wires at points of contact. Evergreen trees shall be guyed.

### **3.10 PRUNING AND MULCHING**

- A. Each tree and shrub shall be pruned in accordance with standard horticultural practice to preserve the natural character of the plant in the manner fitting its use in the landscape design, as approved by the Engineer.
- B. All dead wood or suckers and all broken or badly bruised branches shall be removed by thinning out and shortening branches. Deciduous bare-rooted plants shall have not less than 1/3 of their respective leaf surfaces removed. All cuts shall be made just above a healthy bud. Pruning shall be done with clean, sharp tools.
- C. Cuts over 3/4-inch diameter shall be painted with approved tree paint. Paint shall cover all exposed cambium as well as other living tissue. Paint shall be waterproof, adhesive, and elastic antiseptic; shall be free from kerosene, coal tar, creosote, or other materials injurious to the life of the tree; and shall be approved before it is used.
- D. Plants shall be mulched after planting and cultivating have been completed. A layer of mulch materials shall be spread on finished

landscaping grade within all planting areas to a depth of 2 inches. The mulch around isolated plants shall be 6 inches greater in diameter than the planting hole. All shrub and ground cover beds shall be completely covered with the mulch.

- E. All deciduous tree trunks shall be thoroughly sprayed with a methoxychlor or similar insecticide, and wrapped immediately after planting, with wrapping material overlapping 1-1/2 inches, wound from ground line to the second branch, and securely taped in at least 5 places, including the top, middle, and bottom.

### **3.11 SODDING**

- A. Grass sod shall be provided where indicated and shall be maintained.
- B. The soil shall be prepared and fertilized before sodding. The Contractor shall prepare only enough ground that can be planted within 24 hours thereafter.
- C. Soil preparation shall consist of the following:
  - 1. Preparation of sub-grade grading shall be per the paragraphs titled "General" and "Soil Preparation" above.
  - 2. Finish grading shall be per the paragraph entitled "Soil Preparation," above. Topsoil required at areas to be sodded shall be 1-1/2 inches. The soil additives and fertilizer for finish grading shall consist of mulch at 5 cu yd/1000 sq ft and commercial fertilizer at 20 lb/1000 sq ft.
- D. Sod shall be cut and laid on Site the same day.
- E. The sod shall be placed over leveled, compacted, and prepared finish graded soil. The topsoil and sub-base shall be moist enough to resist shifting.
- F. Sod may be placed at any time when the ground is not frozen. The surface on which the sod is to be laid should be firm and free from footprints or other depressions. A string or line of boards may be used as a guide for setting the first line of sod across the area. Sods of the next course shall be matched against the edge of this first line in such a way the joints between the individual sod pieces in the 2 courses do not coincide. Successive courses shall be matched against the last line laid, in the same manner.

- G. Sod joints shall be closely laid and filled with a mixture of grass seed and screened topsoil at the rate of 2 lbs of seed to each cu yd of topsoil. Sod fill soil shall be thoroughly tamped to a true and even surface at the required finished grade.
- H. Sod on slopes should be staked down by driving a wooden peg through the sod. Wire stakes shall not be used for pegging sod.
- I. Sod shall always be laid across slopes.
- J. All new sod shall be rolled or firmly but lightly tamped with a suitable wooden or metal tamper, sufficiently to set or press sod into underlying soil.
- K. After sodding has been completed, the sodded area shall be cleaned up and thoroughly moistened by sprinklers.

### **3.12 SEEDING-GENERAL**

- A. Grass seeds shall be provided where lawn is indicated and shall be maintained.
- B. The soil shall be prepared and fertilized before seeding or shall be prepared per hydro-seeding instructions. The Contractor shall prepare only enough ground that can be planted within 24 hours thereafter.
- C. Soil preparation shall consist of the following:
  - 1. Preparation of sub-grade grading shall be per paragraphs titled "General" and "Soil Preparation," respectively, above.
  - 2. Finish grading of soil per paragraph entitled "Soil Preparation," above. The soil additives and fertilizer for finish grading shall consist of mulch at 5 cu yd/1000 sq. ft. and commercial fertilizer at 20 lb/1000 sq. ft.
- D. Sow seed at the rate of 2 lbs to 1000 sq ft of area. Equal quantities of seed shall be sown in the directions at right angles to each other to produce an even distribution of seed over the entire area.
- E. No seeding shall be done when wind velocity exceeds 4 mph, within 24 hours after rain, or if the surface has been compacted without first loosening the ground.
- F. The seed shall then be covered with a fine layer of soil to a depth not greater than 1/4-inch.



- G. All lawn areas shall be covered with sphagnum peat moss or clean straw uniformly at a rate of 1-1/2 standard bales per 1000 sq ft.
- H. After covering the seeds with soil and peat or straw, the planted area shall be rolled in 2 directions with a 200-lb roller or other roller designed for lawn seeding.
- I. All lawn slopes greater than 5 percent or places where erosion is a problem shall be mulched with straw at a rate of 2 bales per 1000 sq ft.
- J. Mechanical application (hydroseeding) is acceptable. The Contractor shall notify the Engineer of proposed method, mulch, and type of equipment to be used and shall receive approval before beginning this operation.

### **3.13 HYDRO-SEEDING**

- A. One-step hydro-seeding may be utilized. This method consists of preparing the seed bed; combining seed mixture at the rate of 6 lb per 1000 sq ft for Lawn Mix; fertilizer at the rate of 15 lb per 1000 sq ft; "Silva-fiber" or equal at the rate of 1400 lb per acre of area and water in tanks; agitating these compounds into a well-mixed slurry suspension; and spraying the mixture under pressure onto the prepared areas to be seeded.
- B. Two-step hydro-seeding may be utilized. This method consists of preparing the seed bed; sowing seed mixture at the rate of 6 lb per 1000 sq ft for Lawn Mix in two directions with an approved mechanical seeder; incorporating fertilizers; and spraying under pressure a mixture of water and "Silva-fiber" or equal at the rate of 1400 lb per acre onto prepared, seeded, and fertilized areas. Fertilizer can be applied with the water and "Silva-fiber" or equal mixture if desired.

### **3.14 MISCELLANEOUS ITEMS**

- A. After all steel edging, plants, and sprinkler emitters are in place, and the existing sod in all wood mulch, cobble, and gravel areas has been removed to a depth of 4 inches, place filter fabric over the entire area to receive wood mulch, cobble, or gravel.
- B. Wood chip mulch shall be placed in all shrub areas where indicated, spread carefully and evenly to a minimum depth of 4 inches, or to match existing, over planted areas.

- C. Gravel shall be placed in the planting areas as indicated, spread carefully and evenly to a minimum depth of 4 inches, or to match existing, over the entire area.
- D. Cobble shall be hand placed where indicated. Care shall be taken to fill all spaces, placing small cobble in the voids between the large cobble. When complete, Contractor shall fill all voids with sand and water thoroughly to ensure solid settlement of sand into all cracks and voids. Repeat as necessary to secure cobble from shifting.
- E. Boulders shall be placed in field as directed by Engineer.

END OF SECTION

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**SECTION 02910**

**TREES, PLANTS AND GROUND COVERS**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. The Contractor shall furnish and plant trees, plants and ground covers as shown on the Drawings and as specified herein.
- B. Under this section, the Contractor shall also replace trees, plants and ground covers damaged by his operations. Existing trees, plants and ground covers damaged by the Contractor's operations shall be replaced as directed by the Engineer, to the satisfaction of the Engineer and at no additional cost to the Owner.
- C. Work under this Section shall include, but not be limited to:
  - 1. Soil preparation.
  - 2. Planting mixes.
  - 3. Mulch and planting accessories.
  - 4. Furnishing and installing trees, plants and ground covers.
  - 5. Existing tree care.
  - 6. Filling around trees to remain.
  - 7. Maintenance.

**1.02 QUALITY ASSURANCE**

- A. Comply with requirements of Section 02000, Site Work
- B. Plant names shall comply with "Standardized Plant Names" as adopted by the latest edition of the American Joint Committee of Horticultural Nomenclature. Names of varieties shall conform generally with names accepted by the nursery trade. Provide stock true to botanical name and legibly tagged.
- C. Comply with sizing and grading standards of the latest edition of "American Standard for Nursery Stock". A plant shall be dimensioned as it stands in its

- natural position.
- D. All plants shall be nursery grown under climatic conditions similar to those in the locality of the project.
  - E. Stock furnished shall be at least the minimum size as stock to be replaced. Larger stock is acceptable, at no additional cost, and providing that the larger plants will not be cut back to the existing plant size.
  - F. Provide "specimen" plants with height, shape and character of growth. Tag specimen trees or shrubs at the source of supply. The Engineer will inspect specimen selections at the source of supply for suitability and adaptability to selected location. When specimen plants cannot be purchased locally, provide sufficient photographs of the proposed specimen plants for approval.
  - G. Plants may be inspected and approved at the place of growth, for compliance with specification requirements for quality, size, and variety. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of the work.
  - H. Contractor shall provide and pay for material testing. Testing agency shall be acceptable to the Engineer. Provide the following data:
    - 1. Test representative material samples proposed for use.
    - 2. Topsoil:
      - a. pH factor.
      - b. Mechanical analysis.
      - c. Percentage of organic content.
      - d. Recommendations on type and quantity of additives required to establish satisfactory pH factor and supply of nutrients to bring nutrients to satisfactory level for planting.
    - 3. Peat Moss:
      - a. Loss of weight by ignition.
      - b. Moisture absorption capacity.

### **1.03 SUBMITTALS**

- A. Submittals shall be made in accordance with the requirements of the General Conditions of the Contract Documents. In addition, the following specific information shall be provided:
  - 1. Mulch samples.

2. Planting accessories samples.
3. Certification for topsoil source and pH value; peat moss and plant fertilizer.
4. Material test reports.
5. Upon plant material acceptance, submit written instructions recommending procedures for maintenance of plant materials.

#### **1.04 DELIVERY, STORAGE AND HANDLING**

- A. Deliver fertilizer materials in original, unopened, and undamaged containers showing weight, analysis, and name of manufacturer. Store materials in a manner to prevent wetting and deterioration.
- B. Take all precautions customary in good trade practice in preparing plants for moving. Workmanship that fails to meet the highest standards will be rejected. Spray deciduous plants in foliage with an approved "Anti-Desiccant" immediately after digging to prevent dehydration. Dig, pack, transport, and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice or order to stock and on arrival, the certificate shall be submitted to the Engineer.
- C. Protect all plants from drying out. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss, or in a manner acceptable to the Engineer. Water heeled-in plantings daily. No plant shall be bound with rope or wire in a manner that could damage or break the branches.
- D. Cover plants transported on open vehicles with a protective covering to prevent wind burn.
- E. Provide dry, loose topsoil for planting bed mixes. Frozen or muddy topsoil is not acceptable.

#### **1.05 PROJECT CONDITIONS**

- A. Notify Engineer at least 7 working days prior to installation of plant material.
- B. Protect existing utilities, paving, and other facilities from damage caused by landscaping operations.
- C. Locate and protect existing irrigation system(s) during planting operations. Repair irrigation system components, damaged during planting operations, at Contractor's expense.

## **1.06 WARRANTY**

- A. Warrant plant material to remain alive and be in healthy condition for a period of 1 year after planting and acceptance. Inspection of plants will be made by the Engineer at completion of planting.
- B. Replace, in accordance with these specifications, all plants that are dead or, as determined by the Engineer, are in an unhealthy or unsightly condition, and have lost their natural shape due to dead branches, or other causes due to the Contractor's negligence. The cost of such replacement is at Contractor's expense. Warrant all replacement plants for 1 year after installation.
- C. Warranty shall not include damage or loss of trees, plants, or ground covers caused by fires, floods, freezing rains, lightning storms, or winds over 75 miles per hour, winter kill caused by extreme cold and severe winter conditions not typical of planting area; acts of vandalism or negligence on the part of the Owner.
- D. Remove and immediately replace all plants, as determined by the Engineer to be unsatisfactory during the initial planting installation.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Plants: Provide plants typical of their species or variety; with normal, densely-developed branches and vigorous, fibrous root systems. Provide only sound, healthy, vigorous plants free from defects, disfiguring knots, sunscald injuries, frost cracks, abrasions of the bark, plant diseases, insect eggs, borers, and all forms of infestation. All plants shall have a fully developed form without voids and open spaces. Plants held in storage will be rejected if they show signs of growth during storage.
  - 1. Dig balled and burlapped plants with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant. Provide ball sizes complying with the latest edition of the "American Standard for Nursery Stock". Cracked or mushroomed balls are not acceptable.
  - 2. Container-grown stock: Grown in a container for sufficient length of time for the root system to have developed to hold its soil together, firm and whole.
    - a. No plants shall be loose in the container.

- b. Container stock shall not be pot bound.
- 3. Provide new tree species to match existing tree species. New species shall be provided with a single main trunk. Trees that have the main trunk forming a "Y" shape are not acceptable.
- 4. Plants planted in rows shall be matched in form.
- 5. Plants larger than those existing may be used when acceptable to the Engineer. If the use of larger plants is acceptable, increase the spread of roots or root ball in proportion to the size of the plant.
- 6. No pruning wounds shall be present with a diameter of more than 1-inch and such wounds must show vigorous bark on all edges.
- 7. Shrubs and small plants shall meet the requirements for spread as follows:
  - a. The measurements for height shall be taken from the ground level to the height of the top of the plant and not the longest branch.
  - b. Single stemmed or thin plants will not be accepted.
  - c. Side branches shall be generous, well-twigged, and the plant as a whole well-bushy to the ground.
  - d. Plants shall be in a moist, vigorous condition, free from dead wood, bruises, or other root or branch injuries.

## **2.02 ACCESSORIES**

- A. Topsoil for Planting Beds and Tree Pits: Fertile, friable, natural topsoil of loamy character, without admixture of subsoil material, obtained from a well-drained arable site, reasonably free from clay, lumps, coarse sands, stones, plants, roots, sticks, and other foreign materials, with acidity range of between pH 6.0 and 6.8.
  - 1. Topsoil that has been stripped and stockpiled on site shall be the topsoil to be utilized on this project. Provide additional topsoil if necessary.
  - 2. Provide topsoil free of substances harmful to the plants which will be grown in the soil. Provide 12-inches of topsoil in all plant beds and tree pits.
  - 3. Planting mixture shall be composed of four (4) parts topsoil, two (2) parts peat moss, one (1) part sand and one (1) part well rotted manure, mixed together thoroughly, and worked into existing soil.



- B. Peat Moss: Brown to black in color, weed and seed free granulated raw peat or baled peat, containing not more than 9% mineral on a dry basis. Provide ASTM D2607 sphagnum peat moss with a pH below 6.0 for ericaceous plants.
- C. Fertilizer:
  - 1. Plant Fertilizer Type "A": Commercial type approved by the Engineer, containing 5% nitrogen, 10% phosphoric acid, and 5% potash by weight. 1/4 of nitrogen in the form of nitrates, 1/4 in form of ammonia salt, and 1/2 in form of organic nitrogen.
  - 2. Plant Fertilizer Type "B": Approved acid-base fertilizer.
- D. Anti-Desiccant: Protective film emulsion providing a protective film over plant surfaces; permeable to permit transpiration. Mixed and applied in accordance with manufacturer's instructions.
- E. Premium grade shredded pine bark 3/4-inch to 1-1/2-inch diameter. Furnish in 3 cubic feet bags or bulk.
- F. Water: Free of substances harmful to plant growth. Hoses or other methods of transportation shall be furnished by the Contractor.
- G. Stakes for Staking: Hardwood, 2-inch x 2-inch x 8-feet long.
- H. Stakes for Guying: Hardwood, 2-inch x 2-inch x 36-inches long.
- I. Guying/Staking/Wire: No. 10 or 12, gage galvanized wire.
  - 1. For large trees (4-inch caliper and greater) use turnbuckles and heavier gage wire as indicated below
    - a. Stakes for Staking: Hardwood, 4-inches x 4-inches x 8-feet long.
    - b. Guying/Staking/Wire: No. 6 or 8 gage galvanized wire.
  - 2. Turnbuckles: Galvanized steel of size and gage required to provide tensile strength equal to that of the wire. Turnbuckle openings shall be at least 3-inches.
- J. Staking and Guying Hose: Two ply, reinforced garden hose not less than 1/2-inch inside diameter.
- K. Tree Wrap: Standard waterproofed tree wrapping paper, 2-1/2-inches wide, made of 2 layers of crepe kraft paper weighing not less than 30 lbs. per

ream, cemented together with asphalt. Tree wrap shall be removed at 12 months after installation of plant material.

- L. Twine: Two-ply jute material.
- M. Soil Separator: Rot resistant polypropylene filter fabric, water permeable, and unaffected by freezing and thawing.
- N. Drainage Tile: ASTM F405 corrugated polyethylene drainage tubing, perforated.
- O. Drainage Fill: AASHTO M43 #6 (3/8-inch to 3/4-inch) clean uniformly graded stone or gravel.

## **PART 3 EXECUTION**

### **3.01 INSPECTION**

- A. Examine proposed planting areas and conditions of installation. Do not start planting work until unsatisfactory conditions are corrected.

### **3.02 CARE OF TREES TO REMAIN**

- A. Minor fills of 6-inches or less: Fill with topsoil; hand grade to required finish grade elevation.
- B. Moderate fills of 12-inches or less: Place layer of 3/4-inch to 1-1/2-inch stone or gravel on grade. Provide aggregate depth 1/2 of fill height, minimum of 3-inches. Cover drainage fill with polypropylene filter fabric or 1" thickness straw choke. Fill remaining depth with loose topsoil; hand grade to required finish grade elevations.
- C. Deep fills over 12-inches: Place layer of 3/4-inch to 1-1/2-inch stone or gravel on grade. Extend drainage fill to within 2-inch of required finish grade. Cover drainage fill with polypropylene filter fabric or 1-inch thickness straw choke. Fill remaining depth with loose topsoil; hand grade to required finish grade elevation. Provide tile drainage system and vents as indicated.
- D. Deep fills over 18-inches: Place 4-inch depth of 1-inch to 2-inches stone or gravel fill on grade, extending three (3) feet beyond the outer branch drip line around tree branch perimeter. Cover drainage fill with polypropylene filter fabric or 1-inch thickness straw choke. Place 1-inch to 2-inches stone or gravel fill around tree trunk, extending to within 2-inches of required finish grade elevation. Fill remaining depth with loose topsoil; hand grade to required finish grade elevation. Do not place earth fill in contact with tree trunk, maintain 18-inches diameter of drainage fill exposed at finish grade.

### **3.03 PREPARATION**

- A. Time of Planting:
  - 1. Evergreen material: Plant evergreen materials between September 1 and November 1 or in spring before new growth begins. If project requirements require planting at other times, plants shall be sprayed with anti-desiccant prior to planting operations.
  - 2. Deciduous material: Plant deciduous materials in a dormant condition. If deciduous trees are planted in-leaf, they shall be sprayed with an anti-desiccant prior to planting operation.
  - 3. Planting times other than those indicated shall be acceptable to the Engineer.
- B. Planting shall be performed only by experienced workmen familiar with planting procedures under the supervision of a qualified supervisor.
- C. Locate plants as indicated or as approved in the field after staking by the Contractor. If obstructions are encountered that are not shown on the drawings, do not proceed with planting operations until alternate plant locations have been selected.
- D. Excavate circular plant pits with vertical sides, except for plants specifically indicated to be planted in beds. Provide shrub pits at least 12-inches greater than the diameter of the root system and 24-inches greater for trees. Depth of pit shall accommodate the root system. Provide undisturbed tamped down topsoil to hold root ball at nursery grade as shown on the drawings. Remove excavated materials from the site.
- E. Provide pre-mixed planting mixture for use around the balls and roots of the plants consisting of planting topsoil and 1/2 lb. plant fertilizer Type "A" for each cu. yd. of mixture.
- F. Provide pre-mixed ground cover bed planting mixture consisting of 3 parts planting topsoil to 1 part peat moss and 1/2 lb. plant fertilizer Type "A" per cu. yd. Provide beds a minimum of 12-inches deep. If slopes are greater than 4 to 1 increase depth to 18-inches.
- G. Provide pre-mixed planting mixture for use around the balls and roots of ericaceous plants consisting of 2 part planting topsoil to 1 part sphagnum peat moss and 1/2 lb. plant fertilizer Type "B" per cu. yd. of mixture.

### **3.04 INSTALLATION**

- A. Set plant material in the planting pit to proper grade and alignment. Set plants upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structure. Set plant material 2-inches to 3-inches above the finish grade. No filling will be permitted around trunks or stems. Backfill the pit with planting mixture. Do not use frozen or muddy mixtures for backfilling. Form a ring of soil around the edge of each planting pit to retain water.
- B. After balled and burlapped plants are set, muddle planting soil mixture around bases of balls and fill all voids. Remove all burlap, ropes, and wires from the tops of balls of trees and remove entirely from all other plant material.
- C. Space ground cover plants in accordance with indicated dimensions. Adjust spacing as necessary to evenly fill planting bed with indicated quantity of plants. Plant to within 12-inches of the trunks of trees and shrubs within planting bed and to within 6-inches of edge of bed.
- D. Drain tile: The Contractor shall provide drainage tiles if he encounters standing water in planting pits or conditions warrant. Install drainage tile with perforations down and closed joints, firmly bedded in minimum 4-inch layer of granular fill material. Provide full bearing for each pipe section. Provide continuous slope in the direction of flow.
  - 1. Provide collars and couplings for all in-line joints and elbows for all corners and changes in direction.
  - 2. Provide unperforated run out pipe. Extend drainage tile to out fall indicated and make connection.
  - 3. Obtain required inspections and perform testing before backfilling. Remove obstructions, replace damaged components, and retest system as required. Provide a satisfactory free flowing drainage tile system.
  - 4. Place drainage fill over drain piping after satisfactory testing and acceptance. Compact drainage fill layers not exceeding 6" in loose depth. Exercise care to avoid damage or displacement of installed piping.
    - a. Completely cover drain lines to width of at least 6-inches each side of pipe and above top of pipe to within 18-inches of finish grade.
    - b. Provide soil separator over drainage fill prior to topsoil fill. Overlap a minimum of 6-inches.
  - 5. Install topsoil fill over compacted drainage fill. Compact topsoil fill in

layers not exceeding 6-inches in loose depth. Extend topsoil fill to indicated finish or existing grade elevations.

E. Mulching:

1. Mulch tree and shrub planting pits and shrub beds with required mulching material 3-inches deep immediately after planting. Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface.
2. Mulch ground cover beds with mulch 2-inches deep immediately after planting.

F. Wrapping, Guying and Staking:

1. Inspect trees for injury to trunks, evidence of insect infestation, and improper pruning before wrapping.
2. Wrap trunks of all trees spirally from bottom to top with specified tree wrap and secure in place.
  - a. Overlap 1/2 the width of the tree wrap strip and cover the trunk from the ground to the height of the second branch.
  - b. Secure tree wrap in place with twine wound spirally downward in opposite direction, tied around the tree in at least 3 places in addition to the top and bottom. Wrapping and twine to be removed 12 months after installation of plant material.
3. Staking/Guying:
  - a. Stake/guy all trees immediately after lawn seeding or sodding operations and prior to acceptance. When high winds or other conditions which may affect tree survival or appearance occur, the Engineer may require immediate staking/guying.
  - b. Stake deciduous trees under 3-inches in caliper. Stake evergreen trees under 8-feet tall.
  - c. Guy deciduous trees over 3-inches in caliper. Guy evergreen trees over 8-feet tall.
4. All work shall be acceptable to the Engineer.

G. Pruning:

1. Prune branches of deciduous stock, after planting, to balance the loss of roots and preserve the natural character appropriate to the particular

plant requirements. In general, remove 1/4 to 1/3 of the leaf bearing buds, proportion shall in all cases be acceptable to the Engineer. Remove or cut back broken, damaged, and unsymmetrical growth of new wood.

2. Multiple leader plants: Preserve the leader which will best promote the symmetry of the plant. Cut branches flush with the trunk or main branch, at a point beyond a lateral shoot or bud at a distance of not less than 1/2 the diameter of the supporting branch. Make cut on an angle.
3. Prune evergreens only to remove broken or damaged branches.

H. Care of Existing Trees:

1. Selectively prune existing trees in designated areas, under Engineer's direction. Remove sucker shoots, dead, rubbing, and damaged branching.
2. Fertilize designated existing trees with 2 to 3 lbs. of Type "A" plant fertilizer per inch of trunk diameter, for trees less than 6-inches in diameter and 3 to 5 lbs. for trees greater than 6-inches in diameter.
  - a. Fertilize in early spring before growth begins or in late October.
  - b. Fertilize at 2-feet to 3-feet on center in a triangular pattern to a depth of 18-inches within the dripline.
  - c. Injection or drilling fertilization methods, when used, shall be acceptable subject to Engineer's approval.
3. Water existing trees every 2 weeks until acceptance. Water thoroughly with a fine mist sprinkler head soaker hose or hose at a low flow rate over the entire drip line area as required to allow water to penetrate to a depth of 12-inches to 18-inches.

I. Tree Relocation:

1. Transplant trees designated for relocation to locations shown on the drawings. Prune, dig, ball and burlap, move and plant in accordance with specified tree planting requirements.

### 3.05 MAINTENANCE

- A. Maintain plantings until completion and acceptance of the entire project.
- B. Maintenance shall include pruning, cultivating, weeding, watering, and application of appropriate insecticides and fungicides necessary to maintain plants free of insects and disease.

1. Re-set settled plants to proper grade and position. Restore planting saucer and adjacent material and remove dead material.
2. Tighten and repair guy wires and stakes as required.
3. Remove tree wrapping and twine 12 months after installation of plant material.
4. Correct defective work as soon as possible after deficiencies become apparent and weather and season permit.
5. Water trees, plants, and ground cover beds within the first 24 hours of initial planting, and not less than twice per week until final acceptance.

### **3.06 ACCEPTANCE**

- A. Inspection to determine acceptance of planted areas will be made by the Engineer, upon Contractor's request. Provide notification at least 10 working days before requested inspection date. Planted areas will be accepted provided all requirements, including maintenance, have been complied with and plant materials are alive and in a healthy, vigorous condition.
- B. Upon acceptance, the Owner will assume plant maintenance.

### **3.07 CLEANING**

- A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, soils, debris, and equipment. Repair damage resulting from planting operations.

**+ + + END OF SECTION 02910 + + +**

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**SECTION 02920**

**Site Restoration**

**PART 1 GENERAL**

**1. 1.01 SCOPE**

- A. The Contractor shall provide all, labor, materials, equipment and incidentals required for all site restoration and related operations necessary shown on the Drawings or specified in these Specifications.
- B. This section includes disposition of materials and structures encountered in the Work, all cleanup and any other similar, incidental, or appurtenant operations which may be necessary to properly complete the Work.

**1.02 SUBMITTALS**

- A. Submittals shall be made in accordance with the requirements of the General Conditions of the Contract Documents. In addition, the following specific information shall be provided:
  - 1. The Contractor shall submit certificates of inspection as required by government authorities. The Contractor shall submit other data substantiating that materials comply with specified requirements.
  - 2. The Contractor shall submit instructions recommending procedures to be established by the City for maintenance of site restoration work for one (1) full year.

**1.03 QUALITY ASSURANCE**

- A. The Contractor shall ship site restoration materials with certificates of inspection required by authorities having jurisdiction. The Contractor shall comply with regulations applicable to site restoration materials.
- B. If specified site restoration materials are not obtainable, the Contractor shall submit proof of non-availability to the Engineer together with proposal for use of equivalent material.

**1.04 SAFETY REQUIREMENTS**

- A. Hazards Control:
  - 1. The Contractor shall store volatile wastes in covered metal containers, and



remove from the site of the Work daily.

2. The Contractor shall prevent accumulation of wastes that create hazardous conditions.
  3. The Contractor shall provide adequate ventilation during use of volatile or noxious substances.
- B. The Contractor shall conduct cleaning and disposal operations in compliance with local ordinances and environmental laws and regulations.
1. The Contractor shall not burn or bury rubbish and waste materials on the site of the Work without prior written permission from the Engineer.
  2. The Contractor shall not dispose of volatile wastes such as mineral spirits, oil, or fuel in open drainage ditches or storm or sanitary drains.

#### **1.05 DELIVERY**

- A. The Contractor shall deliver packaged materials in containers showing weight, analysis, and name of manufacturer. The Contractor shall protect materials from deterioration during delivery and while stored at the site of the Work.

### **PART 2 PRODUCTS**

**(NOT USED)**

### **PART 3 EXECUTION**

#### **3.01 DISPOSITION OF MATERIALS AND STRUCTURES ENCOUNTERED IN THE WORK**

- A. Existing materials or structures that may be encountered (within the lines, grades, or trenching sections established for completion of the Work), if unsuitable or unacceptable to the Engineer for use in the Work, and for which the disposition is not otherwise specified, shall either be disposed of by the Contractor or shall remain the property of the City as further provided in this section.
- B. At the option of the City, any existing materials or structures of "value" encountered in the Work shall remain the property of the City. The term "value" shall be defined by the City.
- C. Any existing materials or structures encountered in the Work, and determined not to be of "value" by the City, shall be disposed of by the Contractor, in an approved manner.

### **3.02 JOB CONDITIONS**

- A. The Contractor shall determine the locations of underground utilities and perform Work in a manner which will avoid possible damage. The Contractor shall hand excavate, as required. The Contractor shall maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- B. All bare earth areas within the limit of work shall be grassed, mulched, or covered with other plant material as shown on the Drawings.
- C. On a continuous basis, the Contractor shall maintain the site of the Work free from accumulations of waste, debris, and rubbish caused by his operations.
- D. At completion of the Work, the Contractor shall remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all sight-exposed surfaces. The Contractor shall leave the site of the Work clean and ready for occupancy or use.
- E. The Contractor shall proceed with the complete site restoration work as rapidly as portions of the site of the Work become available, working within seasonal limitations for each kind of site restoration work required. The Contractor will not be allowed to postpone cleanup and seeding or sodding until the end of the Work.
- F. When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, the Contractor shall notify the Engineer before planting.
- G. The Contractor shall install materials during normal planting seasons for each type of site restoration work.
- H. The Contractor shall plant or replace trees and shrubs after final grades are established and prior to planting of lawns, unless otherwise acceptable to the Engineer. If planting of trees and shrubs occurs after lawn work, the Contractor shall protect lawn areas and promptly repair damage to lawns resulting from planting operations. Refer to Section 02900, Trees, Plants and Ground Covers.
- I. The Contractor may, at his option, employ additional measures (other than those specified) to prevent loss of, or damage to the Work resulting from the effects of wind and/or water. No additional compensation will be made for the employment of such additional measures.

### **3.03 CLEANUP**

- A. During site restoration work, the Contractor shall keep pavements clean and the site of the Work in an orderly condition.

- B. The Contractor shall protect site restoration work and materials from damage due to site restoration operations, operations by other contractors, and trades and trespassers. The Contractor shall maintain protection during installation and maintenance periods. The Contractor shall treat, repair, or replace damaged site restoration work as directed by the Engineer.
- C. Immediately upon completion of any section of the Work and before payment therefore has been made, the Contractor shall remove from the site of the Work all construction equipment, temporary structures, and debris, and shall restore the site of the Work to a condition equal to or better than that which existed prior to construction. Waste materials shall be disposed of at locations satisfactory to the City or affected regulatory agencies.
- D. The Contractor shall not remove barricades and warning and direction signs until directed by the Engineer.
- E. After completion of all Work required by the Contract and before final payment has been made, the Contractor shall make a final cleanup of each separate part of the Work; shall restore all surfaces to a neat and orderly condition; and shall remove all construction equipment, tools, and supplies.

#### **3.04 INSPECTION AND ACCEPTANCE**

- A. When site restoration work is completed, including maintenance, the Engineer will, upon request, make an inspection to determine acceptability.
- B. Where inspected site restoration work does not comply with the requirements of the Engineer, the Contractor shall replace rejected work and continue specified maintenance until reinspected by the Engineer and found to be acceptable. The Contractor shall remove rejected plants and materials promptly from the site of the Work.

**+ + + END OF SECTION 02920 + + +**

**SECTION 02933  
SEEDING AND SODDING**

**PART 1 GENERAL**

**1.01 SCOPE**

- A. The work covered by this Section consists of furnishing all labor, equipment and material required to place topsoil, seed, commercial fertilizer, agricultural limestone and mulch material, including seedbed preparation, harrowing, compacting and other placement operations on graded earthen areas as described herein and/or shown on the Drawings.
- B. Seeding operations shall be conducted on all newly graded earthen areas not covered by structures, pavement or sidewalks; all cleared or grubbed areas which are to remain as finish grade surfaces; and on all existing turf areas which are disturbed by construction operations and which are to remain as finish grade surfaces. Areas disturbed by borrow activities shall also be seeded according to these Specifications.
- C. The Work shall also include temporary seeding operations to stabilize earthen surfaces during construction or inclement weather and to minimize stream siltation and erosion. Temporary seeding shall be performed at the times and locations as directed by the Engineer.

**1.02 SUBMITTALS**

- A. Submittals shall be made in accordance with the requirements of the General Conditions of the Contract Documents. In addition, the following information shall be submitted:
  - 1. Prior to seeding operations, labels or certified laboratory reports from an accredited commercial seed laboratory or a state seed laboratory showing the analysis and germination of the seed to be furnished. Acceptance of the seed test reports shall not relieve the Contractor of any responsibility or liability for furnishing seed meeting the requirements of this Section.
  - 2. Prior to topsoil operations, the Contractor shall obtain representative samples and furnish soil test certificates including textural, pH, and organic ignition analysis from the State University Agricultural Extension Services or other certified testing laboratory.

**PART 2 PRODUCTS**

**2.01 ACCEPTABLE MANUFACTURERS**

- A. Wood cellulose fiber mulch shall be manufactured by Weyerhaeuser Company or Conway Corporation.

## **2.02 MATERIALS AND CONSTRUCTION**

### **A. Topsoil**

1. Utilizing designated stockpiles or borrow areas on site, the Contractor shall place a minimum of 6-inches of topsoil over all graded earthen areas and over any other areas to be seeded. Sources of topsoil shall be approved by the Engineer prior to disturbance.
2. Topsoil shall be a friable loam containing a large amount of humus and shall be original surface soil of good, rich, uniform quality, free from any material such as hard clods, stiff clay, hardpan, partially disintegrated stone, pebbles larger than 1/2-inch in diameter, lime, cement, bricks, ashes, cinders, slag, concrete, bitumen or its residue, boards, sticks, chips or other undesirable material harmful or unnecessary to plant growth. Topsoil shall be reasonably free from perennial weeds and shall not contain objectionable plant material, toxic amounts of either acid or alkaline elements or vegetable debris undesirable or harmful to plant life.
3. Topsoil shall be natural topsoil without admixture of subsoil material, and shall be classifiable as loam, silt loam, clay loam, sandy loam or a combination thereof. The pH shall range from 5.5 to 7.0. Topsoil shall contain not less than 5 percent nor more than 20 percent, by weight, of organic matter as determined by loss on ignition of oven dried samples to 65 Degrees C.

### **B. Seed**

1. Seed shall be hulled common Bermuda (Cynodon Dactylon) guaranteed by the dealer to be 98% minimum purity and 90% minimum germination and certified free of giant strain Bermuda.
2. Seed shall be delivered in new bags or bags that are sound and labeled in accordance with the U.S. Department of Agriculture Federal Seed Act.
3. All seed shall be from the last crop available at time of purchase and shall not be moldy, wet or otherwise damaged in transit or storage.
4. Seed shall bear the growers analysis testing to 98 percent for purity and 90 percent for germination. At the discretion of the Engineer, samples of seed may be taken for check against the grower's analysis.
5. Species, rate of seeding, fertilization and other requirements are shown in

Table 02933-1 at the end of this Section.

C. Fertilizer and Liming Materials

1. Fertilizer and liming materials shall comply with applicable state, local and federal laws concerned with their production and use.
2. Commercial fertilizer shall be a ready mixed material and shall be equivalent to the grade or grades specified in Table 02933-1. Container bags shall have the name and address of the manufacturer, the brand name, net weight and chemical composition.
3. Agricultural limestone shall be a pulverized limestone having a calcium carbonate content of not less than 85 percent by weight.
4. Fertilizer shall be a complete fertilizer, the content of which shall meet the following minimum requirements: 10% nitrogen, 10% phosphoric acid, 10% potash, available materials. Fertilizer shall be uniform in composition, dry and free flowing, and shall be delivered to the site in original unopened containers bearing the manufacturer's statement of guarantee.
5. Ammonium Nitrate shall be a standard brand and shall be delivered to the site in original unopened containers. It shall contain not less than 33-1/3% Nitrogen.

D. Mulch Material

1. All mulch materials shall be air dried and reasonably free of noxious weeds and weed seeds or other materials detrimental to plant growth.
2. Mulch shall be composed of wood cellulose fiber, straw or stalks, as specified herein. Mulch shall be suitable for spreading with standard mulch blowing equipment.
3. Straw mulch shall be partially decomposed stalks of wheat, rye, oats or other approved grain crops.
4. Stalks shall be the partially decomposed, shredded residue of corn, cane, sorghum or other approved standing field crops.

E. Mulch Binder

1. Mulch on slopes exceeding 3 to 1 ratio shall be held in place by the use of an approved mulch binder. The mulch binder shall be non-toxic to plant life and shall be acceptable to the Engineer.
2. Emulsified asphalt binder shall be Grade SS-1, ASTM D977. Cutback

asphalt binder shall be Grade RC 70 or RC 250.

- F. Inoculants for Legumes: All leguminous seed shall be inoculated prior to seeding with a standard culture of nitrogen fixing bacteria that is adapted to the particular seed involved.
- G. Water: Water shall be clean, clear water free from any objectionable or harmful chemical qualities or organisms and shall be furnished by the Contractor.
- H. Sod
  - 1. Sod shall be living, growing sod of Bermuda hybrids "Tifway 419" or Tifgreen 328". This includes sod which is dormant during the cold or dry season and capable of renewing growth after the dormant period. All sod shall be obtained from approved sources. The presence of weeds or other noxious growth or any other foreign material which may be detrimental to the proposed planting will be cause of rejection. At least 85% of the plants in the sod shall be composed of the designated variety of Bermuda grass.
  - 2. The Engineer shall be notified of sources before it is harvested. Approval of such sources shall not be construed as an acceptance of the material. The sod will be subject to inspection while it is being planted and any material which has been permitted to dry out excessively or exposed to extreme heat, or which is not viable, will be rejected.
  - 3. In the harvesting of the sod, grass more than 3-inches tall shall be mowed to a height of 3-inches, raked and removed before sod cutting begins. The sod shall be cut into square or rectangular sections which may vary in length, but which shall be of uniform width and thickness, and shall have at least ½-inch of soil adhering firmly to the roots. Care shall be exercised at all times to retain the soil on the roots of the sod during the process of cutting, transporting and planting. Sod shall be transplanted within 24 hours from the time it is harvested. All sod stored shall be kept moist, shall be protected from exposure to the air and sun and from freezing, and shall not be stored for more than 10 days. Sod shall be cut and moved only when the soil moisture conditions are such that favorable results can be expected.

## **PART 3 EXECUTION**

### **3.01 SECURING AND PLACING TOPSOIL**

- A. Topsoil shall be secured from areas from which topsoil has not been previously removed, either by erosion or mechanical methods. Topsoil shall not be removed to a depth in excess of the depth approved by the Engineer.

- B. The area or areas from which topsoil is secured shall possess such uniformity of soil depth, color, texture, drainage and other characteristics as to offer assurance that, when removed the product will be homogeneous in nature and will conform to the requirements of these Specifications.
- C. All areas from which topsoil is to be secured, shall be cleaned of all sticks, boards, stones, lime, cement, ashes, cinders, slag, concrete, bitumen or its residue and any other refuse which will hinder or prevent growth.
- D. In securing topsoil from a designated pit, or elsewhere, should strata or seams of material occur which do not come under the requirements for topsoil, such material shall be removed from the topsoil or if required by the Engineer, the pit shall be abandoned.
- E. Before placing or depositing topsoil upon any areas, all improvement within the area shall be completed, unless otherwise approved by the Engineer.
- F. The areas in which topsoil is to be placed or incorporated shall be prepared before securing topsoil for use.

### **3.02 SEEDBED PREPARATION**

- A. Before liming, fertilizing and seeding, the topsoil surfaces shall be trimmed and worked to true line from unsightly variation, bumps, ridges and depressions and all detrimental material, roots and stones larger than 3-inches in any dimension shall be removed from the soil.
- B. Not earlier than 24 hours before the seed is to be sown, the soil surface to be seeded shall be thoroughly cultivated to a depth of not less than 2-inches with a weighted disc, tiller, pulvimixer or other equipment, until the surface is smooth and in a condition acceptable to the Engineer.
- C. If the prepared surface becomes eroded as a result of rain or for any other reason, or becomes crusted before the seed is sown, the surface shall again be cultivated for seeding.
- D. Ground preparation operations shall be performed only when the ground is in a tillable and workable condition, as determined by the Engineer.

### **3.03 FERTILIZATION AND LIMING**

- A. Following seedbed preparation, fertilizer shall be applied to all areas to be seeded so as to achieve the application rates shown in Table 02933-1 at the end of this Section.



- B. Fertilizer shall be spread evenly over the seedbed and shall be lightly harrowed, raked, or otherwise incorporated into the soil for a depth of 1/2-inch.
- C. Fertilizer need not be incorporated in the soil as specified above when mixed with seed in water and applied with power sprayer equipment. The seed shall not remain in water containing fertilizer for more than 30 minutes when a hydraulic seeder is used.
- D. Agricultural limestone shall be thoroughly mixed into the soil according to the rates in Table 02933-1. The specified rate of application of limestone may be reduced by the Engineer if pH tests indicate this to be desirable. It is the responsibility of the Contractor to obtain such tests and submit the results to the Engineer for adjustment in rates.
- E. It is the responsibility of the Contractor to make one application of a maintenance fertilizer according to the recommendations listed in Table 02933-1.
- F. On the approved grade, spread 20 lbs. per 1,000 sq. ft. of 10-10-10 fertilizer into top 3-inches, hand rake and smooth. The surface shall be brought to finish grade requirements, allowance being made for settlement. Finish grades shall be smooth and free from hollows or other inequalities.
- G. Three weeks after construction of lawns add ammonium nitrate at the rate of 5 lbs. per 1000 sq. ft. of lawn area, and thoroughly water in.

### **3.04 SEEDING**

- A. Seed of the specified group shall be sown as soon as preparation of the seedbed has been completed. No seed shall be sown during high winds, nor until the surface is suitable for working and is in a proper condition. Seeding shall be performed during the dates shown in Table 02933-1 unless otherwise approved by the Engineer. Seed mixtures may be sown together provided they are kept in a thoroughly mixed condition during the seeding operation.
- B. Seed shall be uniformly sown by any approved mechanical method suitable for the slope and size of the areas to be seeded, preferably with a broadcast type seeder, windmill hand seeder or approved mechanical power drawn seed drills. Hydro-seeding and hydro-mulching may be used on steep embankments, provided full coverage is obtained. Care shall be taken to adjust the seeder for seedings at the proper rate before seeding operations are started and to maintain their adjustment during seeding. Seed in hoppers shall be agitated to prevent segregation of the various seeds in a seeding mixture.
- C. Immediately after sowing, the seeds shall be covered and compacted to a depth of 1/8 to 3/8-inch by a cultipacker or suitable roller.

- D. Leguminous seeds shall be inoculated prior to seeding with an approved and compatible nitrogen-fixing inoculant in accordance with the manufacturer's mixing instructions.
- E. Italian rye grass (*Lolium Multiflorum*) shall be evenly seeded with a mechanical spreader at the rate of 5 lbs. per 1000 sq. ft. of area, lightly rake, suitably compact and thoroughly water. Before planting the permanent lawn, the rye shall be thoroughly scarified in a manner to incorporate it into the top three inches of the ground.
- F. The planting of bermuda grass shall be done only within the season extending from April 15 to August 1.

### 3.05 MULCHING

- A. All seeded areas shall be uniformly mulched in a continuous blanket immediately after seeding. The mulch shall be applied so as to permit some sunlight to penetrate and the air to circulate and at the same time shade the ground, reduce erosion and conserve soil moisture. Approximately 25 percent of the ground shall be visible through the mulch blanket.
- B. One of the following mulches shall be spread evenly over the seeded areas at the following application rates:

Wood Cellulose Fiber	1,400 pounds/acre
Straw	4,000 pounds/acre
Stalks	4,000 pounds/acre

- C. These rates may be adjusted at the discretion of the Engineer at no additional cost to the Owner, depending on the texture and condition of the mulch material and the characteristics of the seeded area.
- D. The Contractor shall cover structures, poles, fence and appurtenances if the mulch binder is applied in such a way that it would come in contact with or discolor the structures.
- E. Mulch and binder shall be applied by suitable blowing equipment at closely controlled application rates in a manner acceptable to the Engineer.

### 3.06 WATERING

- A. The Contractor shall be responsible for maintaining the proper moisture

content of the soil to insure adequate plant growth until a satisfactory stand is obtained. If necessary, watering shall be performed to maintain adequate water content in the soil.

- B. Watering shall be accomplished by hoses, tank truck or sprinklers in such a way to prevent erosion, excessive runoff and overwatered spots.

### **3.07 MAINTENANCE**

- A. Upon completion of seeding operations, the Contractor shall clear the area of all equipment, debris and excess material and the premises shall be left in a neat and orderly condition.
- B. The Contractor shall maintain all seeded areas without additional payment until final acceptance of the work by the Owner, and any regrading, refertilizing, reliming, reseeding or remulching shall be done at Contractor's own expense. Seeding work shall be repeated on defective areas until a satisfactory uniform stand is accomplished. Damage resulting from erosion, gulleys, washouts or other causes shall be repaired by filling with topsoil, compacting and repeating the seeding work at Contractor's expense.
- C. Contractor's guarantee of one (1) year shall also cover a fully rooted stand of grass.

**TABLE 02933-1**  
**SEEDING REQUIREMENTS**

Area	Sowing Season	Species	Seed	Rates per 1,000 Square Feet		
				Fertilizer	Limestone	Maintenance**
Flat to rolling terrain with slopes less than 3:1	3/1 to 4/15	Rebel II Turf-Type Tall Fescue	6-8 lbs.	30 lbs. 6-12-12	200 lbs.	10 lbs. 10-10-10
	9/1 to 11/15	Rebel II Turf-Type Tall Fescue	6-8 lbs.	30 lbs. 6-12-12	200 lbs.	15 lbs. 10-10-10
Embankments with slopes greater than 3:1	3/1 to 6/1	Crownvetch* Kentucky 31 Fescue Weeping Lovegrass	1 lb. 2 lbs. 1/4 lb.	30 lbs. 6-12-12	200 lbs.	10 lbs. 0-20-20
	8/1 to 11/1	Crownvetch* Kentucky 31 Fescue Annual Ryegrass	1 lb. 2 lb. 2 lb.	30 lbs. 6-12-12	200 lbs.	10 lbs. 0-20-20

\* Requires inoculation

\*\* Maintenance fertilizer shall be applied in early spring following initial establishment of cover

**+ + + END OF SECTION 02933 + + +**

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**SECTION 03300**

**Concrete Work**

**PART 1 – GENERAL**

**1.01 SCOPE**

- A. The extent of concrete work is shown on the Drawings and indicated in the Specifications.

**1.02 QUALITY ASSURANCE**

- A. Codes and Standards: Comply with the provisions of the following codes, specifications and standards, except as otherwise shown or specified:
1. ACI 301 "Specifications for Structural Concrete for Buildings"
  2. ACI 311.4R "Guide for Concrete Inspection"
  3. ACI 318 "Building Code Requirements for Reinforced Concrete"
  4. ACI 347 "Recommended Practice for Concrete Formwork"
  5. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete"
  6. Concrete Reinforcing Steel Institute, "Manual of Standard Practice"
  7. Where local building code requirements exist, comply with provisions of such codes that are more stringent than the preceding codes and standards.
- B. Workmanship: The Contractor is responsible for correction of concrete work that does not conform to the specified requirements, including strength, tolerances and finishes. Correct deficient concrete as approved by the Engineer.
- C. Construction Tolerances:
1. Variation from Plumb: For lines and surfaces of columns, piers, walls, and arises, do not exceed 1/4 inch in 10 feet nor more than one inch total; except for exposed corners, control joints and other conspicuous lines, do not exceed 1/4 inch in any story or 20 foot maximum, nor 1/2 inch in 40 feet or more.

2. Variation from Grade: For grades shown for slab soffits, ceilings, beam soffits, and in arises, do not exceed 1/4 inch in 10 feet, 3/8 inch in any bay or 20 foot maximum, nor 3/4 inch in 40 feet or more. For exposed lintels, sills, parapets, joints and other conspicuous lines, do not exceed 1/4 inch in any bay or 20 foot maximum, or 1/2 inch in 40 feet or more from horizontal or grade indicated.
3. Variation from Linear Building Line: For position shown in plan and related position of columns, walls, and partitions, do not exceed 1/2 inch in any bay or 20 foot maximum, nor one inch in 40 feet or more.
4. Variation in Cross-Sectional Dimensions: For columns and beams and thickness of slabs and walls, do not exceed minus 1/4 inch nor plus 1/2 inch.

### **1.03 CLASSES OF CONCRETE**

- A. Class "A" concrete 4,000 psi compressive strength at 28 days shall be steel reinforced and includes the following:
  1. Foundations
  2. Walls
  3. Slab on grade
  4. Beams
  5. Elevated concrete floors
  6. Columns
- B. Class "B" concrete 3,000 psi compressive strength at 28 days shall be placed without forms or with simple forms, with little or no reinforcing, and includes the following:
  1. Sidewalks
  2. Curbs
  3. Pavement patch
  4. Thrust blocking
  5. Fence post footing
  6. Mud slabs
  7. Fill concrete
  8. Concrete encasement of pipe

## 1.04 FACTORY TESTING AND MIX DESIGN

- A. Testing Before Construction: Employ concrete testing laboratory, acceptable to Engineer, at Contractor's expense to perform material evaluation tests and to design concrete mixes.
- D. Tests for Concrete Materials:
  - 1. Test aggregates by the methods of sampling and testing of ASTM C 33.
  - 2. For Portland cement, sample the cement and determine the properties by the methods of test of ASTM C 150.
  - 3. Certificates of material properties and compliance with specified requirements may be submitted in lieu of testing, when acceptable to the Engineer.
- C. Proportioning and Design of Mixes:
  - 1. Submit written mix design to the Engineer for review and approval at least 15 days prior to start of work. Do not begin concrete work until the mix design has been approved by the Engineer.
  - 2. Prepare design mixes for each type of concrete. Use an independent testing facility acceptable to the Engineer for preparing and reporting proposed mix designs.
  - 3. Proportion mixes by either laboratory trial batch or field experience methods, using materials to be employed on the project for each class of concrete required, complying with ACI 211.1.
  - 4. Submit written reports to the Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by the Engineer.
- D. Laboratory Trial Batches:
  - 1. When laboratory trial batches are used to select concrete proportions, prepare test specimens in accordance with ASTM C 192 and conduct strength tests in accordance with ASTM C 39, as specified in ACI 301.
  - 2. Establish a curve showing relationship between water-cement ratio (or cement content) and compressive strength with at least three

points representing batches that produce strengths above and below that required. Use not less than three specimens tested at 28-days, or an earlier age when acceptable to the Engineer, to establish each point on the curve.

E. Field Experience Method:

1. When field experience methods are used to select concrete proportions, establish proportions as specified in ACI 301.
2. Strength data for establishing standard deviation will be considered suitable if the concrete production facility has certified records consisting of at least thirty consecutive tests in one group or the statistical average for two groups totaling thirty or more tests, representing similar materials and projects conditions.

F. Standard Deviation:

1. If standard deviation exceeds 600 psi or if no suitable records are available, select proportions to produce an average strength of at least 1200-psi greater than the required compressive strength of concrete.
2. After sufficient experience and test data become available from the job, using ACI 214 methods of evaluation, the standard deviation may be reduced when the probable frequency of an average of three consecutive tests below required compressive strength will not exceed one in one hundred.

G. Adjustment to Concrete Mixes: Mix design adjustments may be requested by the Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to the City and as accepted by the Engineer. Laboratory test data for revised mix designs and strength results must be submitted to and accepted by the Engineer before using in the work.

H. Compressive Strength:

1. Design mixes for a specified strength of 3,500 psi at 28 days using a minimum of 5 1/4 bags of cement (94 pounds), and a maximum of 6 gallons of water per bag of cement, unless otherwise indicated.
2. Design mixes to provide concrete with the properties shown on the Drawings.



I. Admixtures:

1. Use air-entraining admixture in all concrete, unless otherwise shown or specified. Add air-entraining admixture at the manufacturer's prescribed rate to result in concrete at the point of placement having air content by volume within the following limits:
  - a. 6% to 9% for maximum aggregate 1/2 inch and under.
  - b. 4% to 6% for maximum aggregate over 1/2 inch through 1 1/2 inch.
  - c. 2.5% to 4.5% for maximum aggregate over 1 1/2 inch.

J. Slump Limits:

1. Proportion and design mixes to result in concrete slump at the point of placement as follows:
  - a. Ramps and Sloping Surfaces: Not more than 3 inches.
  - b. Reinforced Foundation Systems: Not less than 1 inch and not more than 3 inches.
  - c. All Other Concrete: Not less than 1 inch and not more than 4 inches.

**1.05 TESTING DURING CONSTRUCTION**

- A. All testing of samples will be done by a testing laboratory selected by the City in accordance with Section 01410. Testing shall be paid for separately by the City directly to the testing laboratory.

B. Testing During Construction:

1. Perform one slump test (ASTM C 143) for each concrete load at point of discharge, and prepare one set of three standard compressive strength cylinders (ASTM C 31) for each 50 cubic yards or fraction thereof of concrete placed in any one day. Store compressive strength cylinders in dampened protective material.

C. The following quality control testing is required during construction:

1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C94.

2. Slump: ASTM C 143; one test for each concrete load at point of discharge; and one for each set of compressive strength test specimens; additional tests when concrete consistency seems to have changed.

D. Compressive Strength:

1. ASTM C 39, one set of 6 standard cylinders (ASTM C 31) for each 50 cubic yards or fraction thereof, of each concrete class placed in any one day or for each 5,000 square feet of surface area placed; 2 specimens tested at 7 days, 3 specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
2. When the total quantity of a given class of concrete is less than 50 cubic yards, or the quantity of concrete or any single structure is less than 10 cubic yards, the Engineer may waive compressive strength testing, but such action shall not relieve the Contractor from responsibility for furnishing concrete of the required strength.
3. The strength level of concrete will be considered satisfactory if the averages of all sets of three consecutive strength test results equal or exceed the specified strength and no individual strength test result falls below the specified strength by more than 500 psi.

E. Air Content: ASTM C 231, pressure method or ASTM C 173; one for each set of compressive strength test specimens.

F. Additional Tests: When test results indicate specified concrete strengths and other characteristics have not been attained, perform additional testing to determine the extent to which deficiencies exist. Where cored cylinders are utilized to determine adequacy of concrete, comply with ASTM C42.

## 1.06 SUBMITTALS

- A. Manufacturer's Data: For information only, submit manufacturer's specifications with application and installation instructions for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds and others as requested by the Engineer.
- B. Shop Drawings: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with the ACI Special Publication No. 66 (SP-66) "ACI Detailing Manual" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangements of concrete

reinforcement. Include special reinforcement required at openings through concrete structures.

- C. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design test as specified.

## **PART 2 – PRODUCTS**

### **2.01 FORM MATERIALS**

- A. Forms for Exposed Finish Concrete:
1. Unless otherwise shown or specified, construct all formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood-faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on Drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.
  2. Where plywood is used in formwork, provide material complying with U.S. Product Standard PS-I "A-C or B-B High Density Overlaid Concrete Form", Class I, unless otherwise acceptable to Engineer.
- B. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Textured Finished Concrete: Form textured finish concrete surfaces with units of face design, size arrangement and configuration as shown on the Drawings. Provide solid backing and form supports to ensure stability of textured form liners.
- D. Cylindrical Columns and Supports: Form all round-section members with metal, fiberglass reinforced plastic, or paper or fiber tubes. Construct paper or fiber tubes of laminated plies using water-resistant type adhesive and wax-impregnated exterior for weather and moisture protection. Provide units with sufficient wall thickness to resist loads imposed by wet concrete without deformation.
- E. Curved Structures: Form round or curved surfaces to true arcs without flat planes unless otherwise indicated on the Drawings.

- F. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

## 2.02 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60 unless otherwise shown.
- B. Epoxy-Coated Reinforcing Bars: ASTM A 775.
- C. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- D. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
- E. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI recommendations, unless otherwise specified. Solid precast concrete block may be used for supporting footing and foundation mats against earth material. Wood, clay, brick and other non-standard devices will not be acceptable.
  - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base materials will not support chair legs.
  - 2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs that are plastic protected or stainless steel protected.

## 2.03 CONCRETE MATERIALS

- A. Portland Cement:
  - 1. ASTM C 150, Type I, unless otherwise acceptable to Engineer.
  - 2. Use only one brand of cement throughout the project, unless otherwise acceptable to Engineer.
- B. Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for all exposed concrete.
  - 1. Fine Aggregate: Clean, sharp, natural sand free from loam, clay, lumps or other deleterious substances.

2. Coarse Aggregate: Clean, uncoated, crushed granite or similar hard stone processed from natural rock or stone, and containing no clay, mud, loam or foreign matter.
3. Maximum Aggregate Size: Not larger than one-fifth of the narrowest dimension between sides of forms, one-third of the depth of slabs, nor three-fourths of the minimum clear spacing between individual reinforcing bars or bundles of bars. Size limitations may be waived if, in the judgment of the Engineer, workability and methods of consolidation are such that concrete can be placed without honeycomb or voids.
4. Water: Clean, fresh, and safely drinkable by humans.
5. Air-Entraining Admixture: ASTM C 260.

## **2.04 RELATED MATERIALS**

- A. Grout: Ready mixed Portland cement, sand and water mixture conforming with materials and mix design of highest strength project-required concrete except for deletion of coarse aggregate.
- B. Nonshrink Grout: Factory-premixed cementitious material containing no corrosive material, which is nonshrink from time of placement and shows no expansion after final set when tested under ASTM C 827, has an initial setting time of not less than 45 minutes, has a 24 hour compressive strength of not less than 3,000 psi under ASTM C 109 for a trowelable mix, and is selected and applied in conformance with manufacturer's recommendations.
- C. Compaction Grout:
  1. Compaction grouting of voids surrounding the exterior of sewers or manholes is accomplished with the constant placement of a stiff, mortar-type Portland cement based grout material at pressures not to exceed 100 psi at the pump, unless otherwise approved by the Engineer. Cement (if used) shall be Type I or Type II Portland Cement conforming to ASTM C150. Admixtures (if used) shall conform to ASTM C1017/C1017M, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete. Grout shall either be ready-mix transported to the site, or mixed on-site. For each batch of ready-mix delivered to the site, the ready-mix plant shall issue a ticket recording the mix components, time mixed, water added, etc. The slump of the grout mix shall not exceed 3 inches.

2. The injected grout mass shall occupy the void space. The grout mass shall be injected at pressures which are requisite for the conditions encountered and shall not exceed 10 psi at the point of injection, unless otherwise approved by the Engineer. The grout volume shall expand and densify targeted soils in-place. The grout pressure produces soil compaction by displacing soil at depth until resisted by the weight of overlying soils. The grouting treatment is applied on a grid pattern, to accomplish improved compaction of displaced soils and greater uniformity of the treated soil mass.
  3. Provide positive displacement pumping units with variable speed capabilities. The pumping system shall be capable of pumping the grout at pressures up to 100 psi at the pump.
  4. Use steel injection pipes of sufficient diameter and wall thickness to allow grout injection to the pressure specified. Injection pipes may be installed from the interior of manholes. Otherwise, injection pipes shall be installed from the ground surface. The end of each injection pipe shall be sealed to prevent soil strata from entering the pipe during installation.
- D. Waterstops (Plastic): Provide flat, dumbbell type or centerbulb type waterstops at construction joints and other joints as indicated. Size to suit joints. Use polyvinyl chloride (PVC) waterstops complying with Corps of Engineers Spec. CRD-C572.
- E. Waterstops (Copper): Provide formed-sheet, annealed copper waterstops as shown.
- F. Joint Sealing Compound: One component, non-sag, low modulus polyurethane or polysulfide sealant conforming to Federal Specification TT-S230C, Class A, Type II and ASTM C920, Type S, Class 25, Grade NS.
- G. Moisture Barrier: Polyethylene sheet not less than 8 mils thick.
- H. Liquid Chemical Floor Hardener: Colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent, containing not less than two pounds of fluosilicates per gallon.
- I. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately nine ounces per square yard, complying with AASHTO M182, Class 2.

- J. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
1. Waterproof Paper.
  2. Polyethylene Film.
  3. Polyethylene-coated burlap.
- K. Membrane-Forming Curing Compound: ASTM C 309, Type I unless other type acceptable to Engineer.

## 2.05 CONCRETE MIXING

A. Job-Site Mixing:

1. Mix materials for concrete in an acceptable drum type batch machine mixer. For mixers of one cubic yard, or smaller capacity, continue mixing at least 1 1/2 minutes, but not more than 5 minutes after all ingredients are in the mixer, before any part of the batch is released. For mixers of capacity larger than one cubic yard, increase the minimum 1 1/2 minutes of mixing time by 15 seconds for each additional cubic yard, or fraction thereof.
2. Provide a batch ticket for each batch discharged and used in the work, indicating the project identification name and number, date, mix time, quantity, and amount of water introduced.

B. Ready-Mix Concrete:

1. Comply with the requirements of ASTM C 94, and as herein specified.
2. Delete the references for allowing additional water to be added to the batch for material with insufficient slump. Addition of water to the batch will not be permitted.
3. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.
4. When the air temperature is between 85F and 90F, reduce the mixing and delivery time from 1 1/2 hours to 75 minutes, and when the air temperature is above 90F, reduce the mixing and delivery time to 60 minutes.

## **2.06 FLOWABLE FILL**

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

## **PART 3 – EXECUTION**

### **3.01 FORMS**

- A. Design, erect, support, brace and maintain:
  - 1. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by the concrete structure. Construct formwork so concrete members and structures are of correct size, shapes, alignment, elevation and position.
  - 2. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.
  - 3. Construct forms complying with ACI 347, to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
  - 4. Fabricate forms for easy removal without hammering or prying against the concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.



5. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
  6. Chamfer exposed corners and edges as shown, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- B. Form Ties:
1. Factory-fabricated, adjustable-length, metal form ties, designed to prevent form deflection, to prevent spalling concrete surfaces upon removal, and to prevent passage of water along tie surface through concrete.
  2. Provide ties so portion remaining within concrete is at least 1 inch inside concrete, and do not leave holes larger than one-inch diameter in concrete surface.
- C. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.
- D. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing after concrete placement if required to eliminate mortar leaks and maintain proper alignment.

### **3.02 PLACING REINFORCEMENT**

- A. Comply with the specified codes and standards, and Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
- C. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.

- D. Place reinforcement to obtain at least the minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Do not place reinforcing bars more than 2 inches beyond the last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
- F. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

### 3.03 JOINTS

- A. Construction Joints:
  - 1. Locate and install necessary construction joints, which are not shown on the Drawings, so as not to impair the strength and appearance of the structure, as acceptable to the Engineer.
  - 2. Provide keyways in all construction joints in walls, slabs and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs. Construct keyways 1 1/2 inches deep unless otherwise detailed.
  - 3. Place construction joints perpendicular to the main reinforcement. Continue all reinforcement across construction joints.
- B. Waterstops: Provide waterstops in construction joints as indicated. Install waterstops to form a continuous diaphragm in each joint. Make provisions to support and protect waterstops during the progress of the work. Fabricate field joints in waterstops in accordance with manufacturer's printed instructions. Protect waterstop material from damage where it protrudes from any point.
- C. Isolation Joints in Slabs-on-Ground: Construct isolation joints in slabs on ground at all points of contact between slabs on ground and vertical surfaces, such as column pedestals, foundation walls, grade beams and elsewhere as indicated.
- D. Control Joints in Slabs-on-Ground:

1. Construct control joints in slabs-on-ground to form panels of patterns as shown. Use inserts 1/8 to 1/4 inch wide x 1/4 of the slab depth, unless otherwise shown.
2. Form control joints by inserting a premolded plastic, hardboard or fiberboard strip into the fresh concrete until the top surface of the strip is flush with the slab surface. Tool slab edges round on each side of insert. After the concrete has cured, remove inserts and clean groove of loose debris.

### **3.04 INSTALLATION OF EMBEDDED ITEMS**

- A. General: Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of the items to be attached thereto.
- B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain the required elevations and contours in the finished slab surface. Provide and secure units sufficiently strong to support the types of screeds required. Align the concrete surface to the elevation of the screed strips by the use of strike-off templates or accepted compacting type screeds.

### **3.05 PREPARATION OF FORM SURFACES**

- A. Clean re-used forms of concrete matrix residue, repair, and patch as required to return forms to acceptable surface condition. Coat the contact surfaces of forms with a form-coating compound before reinforcement is placed.
- B. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of the form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in the forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
- C. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

### 3.06 CONCRETE PLACEMENT

A. Pre-Placement Inspection:

1. Before placing concrete, inspect and complete the formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit the installation of their work; cooperate with other trades in setting such work, as required. Moisten wood forms immediately before placing concrete, where form coatings are not used.
2. Coordinate the installation of joint materials and moisture barriers with placement of forms and reinforcing steel.

B. Construction Sequence: Before placing any concrete, complete blasting, heavy earthwork and other construction operations that might cause damage to concrete structures.

1. General:

- a. Comply with ACI 304, and as herein specified.
- b. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation due to rehandling or flowing.
- c. At all horizontal waterstops, place 1/2 inch of grout for each foot of wall pour height in bottom of forms immediately before pouring concrete walls.

2. Placing Concrete in Forms:

- a. Deposit concrete in forms in horizontal layers not deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
- b. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping. Use equipment and procedures for consolidation

of concrete in accordance with ACI 309 recommended practices.

- c. Do not use vibrators to transport concrete inside of forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate the placed layer of concrete and at least 6 inches into the preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit the duration of vibration to the time necessary to consolidate the concrete and complete embedment of reinforcement and other embedded items without causing segregation of the mix.

3. Placing Concrete Slabs:

- a. Deposit and consolidate concrete in a continuous operation, within the limits of construction joints, until the placing of a panel or section is completed.
- b. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
- c. Bring slab surfaces to the correct level with a straightedge and strikeoff. Use bull floats or darbies to smooth the surface, leaving it free of humps or hollows. Do not disturb the slab surfaces prior to beginning finishing operations.
- d. Maintain reinforcing in the proper position during concrete placement operations.

4. Cold Weather Placing:

- a. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306R and as herein specified.
- b. When air temperature has fallen to or is expected to fall below 40F, uniformly heat all water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50F, and not more than 80F at point of placement.

- c. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
- d. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in writing by the Engineer.

5. Hot Weather Placing:

- a. When hot weather conditions exist that would seriously impair the quality and strength of concrete, place concrete in compliance with ACI 305R and as herein specified.
- b. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90F. Mixing water may be chilled, or chopped ice may be used to control the concrete temperature, provided the water equivalent of the ice is calculated to the total amount of mixing water.
- c. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that the steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
- d. Fog spray forms, reinforcing steel and subgrade just before concrete is placed.
- e. Do not use retarding admixtures without the written acceptance of the Engineer.

### 3.07 FINISH OF FORMED SURFACES

- A. Concealed Surfaces: For formed concrete surfaces not exposed-to-view in the finished work, leave surface finish imparted by the form facing material used, with defective areas and form tie voids repaired and patched as specified, and fins and other projections exceeding 1/4 inch in height rubbed flush.
- B. Visible Surfaces: For formed concrete surfaces exposed-to-view, including those surfaces of water or other material holding structures visible when the structure is empty, or surfaces that are to be covered with a thin or flexible finish material bonded to the concrete, perform finish operations as specified above under "Concealed Surfaces," and in addition wet and rub entire surfaces with a carborundum stone of medium fineness until all form marks and other surface irregularities have been removed and a uniform

surface appearance achieved. Do not create a plaster coating on concrete.

- C. Unformed Visible Surfaces: At tops of walls, horizontal offsets and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces.

### **3.08 MONOLITHIC SLAB FINISHES**

A. Scratch Finish:

1. Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, Portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated.
2. After placing slabs, plane surface so that depressions between high spots do not exceed 1/2 inch under a 10-foot straightedge. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set, with stiff brushes, brooms or rakes.

B. Float Finish:

1. Apply float finish to monolithic slab surfaces that are to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated.
2. After screeding, consolidating and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of floats. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane so that depressions between high spots do not exceed 6/16 inch under a 10 foot straightedge. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

C. Trowel Finish:

1. Apply trowel finish to monolithic slab surfaces that are to be exposed-to-view, unless otherwise shown, and slab surfaces that are to be covered with resilient flooring, carpet, ceramic or quarry tile, paint or other thinfilm finish coating system.
2. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with a level surface plane so that depressions between high spots do not exceed 1/8 inch under a 10 foot straightedge. Grind smooth surface defects that would telegraph through applied floor covering system.

D. Chemical-Hardener Finish:

1. Apply chemical-hardener finish to interior concrete floors where indicated. Apply liquid chemical-hardener after complete curing and drying of the concrete surface. Dilute liquid hardener with water, and apply in three coats; first coat, 1/3 strength; second coat, 1/2 strength; third coat, 2/3 strength. Evenly apply each coat, and allow 24 hours for drying between coats.
2. Apply proprietary chemical hardeners, in accordance with manufacturer's printed instructions.
3. After final coat of chemical-hardener solution is applied and dried, remove surplus hardener by scrubbing and mopping with water.

E. Non-Slip Broom Finish:

1. Apply non-slip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated.
2. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with the Engineer before application.

F. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.



### 3.09 CONCRETE CURING AND PROTECTION

A. General:

1. Protect freshly placed concrete from premature drying, and excessive cold or hot temperature, and maintain without drying at a relatively constant temperature for a period of time necessary for hydration of cement and proper hardening.
2. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
3. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least seven days and in accordance with ACI 30I procedures. Avoid rapid drying at end of final curing period.

B. Curing Methods: Perform curing of concrete by one or more of the following methods as selected by the Contractor:

1. Provide moist curing: by covering concrete surfaces with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4 inch lap over adjacent absorptive cover.
2. Provide moisture-cover curing: by covering concrete surfaces with moisture-retaining cover, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. Provide membrane curing: by applying compound to damp concrete surfaces as soon as film has disappeared. Apply uniformly in continuous operation by power-spray or roller equipment in accordance with manufacturer's directions. Recoat areas that are subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
4. Do not use membrane curing compounds on surfaces which are to be covered with a coating material applied directly to concrete or with a covering material bonded to concrete, such as other concrete, liquid floor hardener, waterproofing, dampproofing,

membrane roofing, flooring, painting, and other coatings and finish materials, unless otherwise acceptable to the Engineer.

- C. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- D. Curing Unformed Surfaces: Initially cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by moist curing. Final cure unformed surfaces, unless otherwise specified, by methods specified above, as applicable.

### **3.10 FORM REMOVAL**

- A. In all cases, time and sequence of concrete form removal is at Contractor discretion. Formwork supporting weight of concrete, such as beams and slabs, must remain in place at least 14 days and until concrete has attained minimum design 28 day compressive strength. Formwork not supporting weight of concrete, such as sides of beams, walls and columns, may be removed no sooner than 48 hours after placement of concrete or when concrete is sufficiently hard as not to be damaged by form removal operations.

### **3.11 RE-USE OF FORMS**

- A. Clean and repair surfaces of forms to be re-used in the work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form coating compound as specified for new formwork.
- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joints to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Engineer.

### **3.12 MISCELLANEOUS CONCRETE ITEMS**

- A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on Drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment. Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads and landings and associated items. Cast-in safety inserts and accessories as shown on Drawings. Screed, tamp, and finish concrete surfaces as scheduled.
- E. Reinforced Masonry: Provide concrete grout for reinforced masonry lintels and bond beams where indicated on Drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.
- F. Compaction Grouting: The Contractor shall confirm the Engineer's approximate location of void areas around the suspect sewer or manhole prior to installation of the injection pipes. All costs associated with the void investigation shall be incidental to the compaction grouting work. If necessary, the grouting operation shall be delayed until the Contractor can perform point repairs or other rehabilitative measures to restore structural stability to the sewer. The grout injection rate shall not exceed 4.0 cubic feet per minute, unless authorized by the Engineer. Progress the grouting process in stages using the "bottom up" method. The "bottom up" method stages start at the bottom of the grouting pipe, at least 1 foot into the underlying dense soil strata, progressing upward at maximum intervals of 2 feet. The Contractor shall carefully control grout pumping rates and injection pressures. Injection holes lost during grouting operations shall be replaced by the Contractor at no additional cost to the Owner. For injection pipes installed from the interior of manholes, remove the injectors and patch the holes with quick setting hydraulic cement.

### **3.13 FLOWABLE FILL**

- A. Furnish and place flowable fill concrete as directed by the Engineer. Typical applications include bedding, encasement and closures for pipe and general backfill of trenches.
- B. Contractor shall flood the pipeline, sequence Flowable Fill placement, provide straps, soil anchors or other approved means of restraint to

prevent flotation or misalignment that may occur at no additional cost to the City.

- C. Flowable fill shall be protected from freezing for a period of 36 hours after placement.
- D. All flowable fill shall be furnished and installed in accordance with Georgia Department of Transportation Standard Specification Section 600 – Controlled Low Strength Flowable Fill and/or City of Atlanta Department of Public Works flowable fill requirements whichever is deemed appropriate by the Engineer.

### **3.14 CONCRETE SURFACE REPAIRS**

#### **A. Patching Defective Areas:**

- 1. Repair and patch defective areas with cement mortar immediately after removal of forms, but only when acceptable to Engineer.
- 2. Cut out honeycomb, rock pockets, voids over 1/8 inch in any dimension and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than one inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with neat cement grout. Proprietary patching compounds may be used when acceptable to Engineer.
- 3. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color of surrounding surface. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

#### **B. Repair of Formed Surfaces:**

- 1. Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Engineer. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets and holes left by tie rods and bolts; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement core plugs secured in place with bonding agent.

2. Repair concealed formed surfaces, where possible, that contain defects that adversely affect the durability of the concrete. If defects cannot be repaired, remove and replace the concrete.

C. Repair of Unformed Surfaces:

1. Test unformed surfaces, such as monolithic slabs, for smoothness and to verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.
2. Repair finished unformed surfaces that contain defects that adversely affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01 inch wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.
3. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
4. Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to the Engineer.
5. Repair defective areas, except random cracks and single holes not exceeding one-inch diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete, and brush with a neat cement grout coating or concrete bonding agent. Place patching concrete before grout takes its initial set. Mix patching concrete of same materials to provide concrete of the same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in the same manner as adjacent concrete.
6. Repair isolated random cracks and single holes not over one inch in diameter by dry-pack method. Groove top of cracks and cutout holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and brush with neat cement grout coating or concrete bonding agent. Place dry-pack before cement grout takes its initial set. Mix dry-pack, consisting of one

part Portland cement to 2 1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched areas continuously moist for not less than 72 hours.

7. Repair methods not specified above may be used, subject to acceptance of Engineer.
8. Agreement by the Engineer to permit repair or patching of concrete does not waive the Engineer's authority to require complete removal and replacement of defective concrete pours should the patch not prove satisfactory to the Engineer, due either to deficiency in strength, function or appearance.

END OF SECTION

Exhibit E  
Drawings- *See Attachment*

# Exhibit F

## City Security Policies



**EXHIBIT F**  
**CITY SECURITY POLICIES**

**SECTION 00001**

**PART 1 – GENERAL SCOPE**

- A. The Contractor shall be responsible for conducting all work in a safe manner and shall take reasonable precautions to ensure the safety and protection of workers, property and the general public.
- B. All Construction shall be conducted in accordance with the latest applicable requirements for part 1926 of the Occupational Safety and Health Regulations for Construction, as well as any other local, state or federal safety codes and regulations.
- C. The Contractor shall designate a trained and qualified employee who is to be responsible for ensuring that the work is performed safely and in conformance with all applicable regulations.
- D. The Contractor shall determine the safety hazards involved in prosecuting the work and the precautions necessary to conduct the work safely. If the Contractor is unsure as to any special hazards which may be unique to the various processes and facilities at the treatment plant or jobsite, it shall be the Contractor's responsibility to determine such information prior to beginning the work.

**SPECIAL REQUIREMENTS – Not Used**

**SECTION 00002**

**JOB SITE SECURITY PART 1 – GENERAL**

**BARRICADES, LIGHTS AND SIGNALS**

- A. The Contractor shall furnish and erect such barricades, fences, lights and danger signals and shall provide such other precautionary measures for the protection of persons or property and of the work as necessary. Barricades shall be painted in a color that will be visible at night. From sunset to sunrise, the Contractor shall furnish and maintain at least one light at each barricade and sufficient numbers of barricades shall be erected to keep vehicles from being driven on or into any work under construction. All barricades must the Manual of Uniform Traffic Control Devices (MUTCD) Standards.
- B. The Contractor will be held responsible for all damage to the work due to failure of barricades, signs and lights and whenever evidence is found of such damage. The Contractor shall

immediately remove the damaged portion and replace it at Contractor's cost and expense. The Contractor's responsibility for the maintenance of barricades, signs and lights shall no cease until the project has been accepted by the owner.

## **SECTION 00003**

### **STORAGE AND PROTECTION PART 1 – GENERAL**

#### **1.01 SCOPE**

The work under this section includes, but is not necessarily limited to the furnishing of all labor, tools and materials necessary to properly store and protect all materials, equipment, products and the like, as necessary for the proper and complete performance of the work.

#### **1.02 STORAGE AND PROTECTION**

##### **A. STORAGE**

1. Maintain ample way for foot traffic at all times, except as otherwise approved by the city representative.
2. All property damaged by reason of storing of material shall be properly replaced at no additional cost to the city.
3. Packaged material shall be delivered in original unopened containers and so stored until ready for use.
4. All material shall meet the requirements of these specifications at the time that they are used in the work.

##### **5. Store products in accordance with manufacturer's instructions. B. PROTECTION**

1. Use all means necessary to protect the materials, equipment and products of every section before, during and after installation and to protect the installed foreign material and damage by water, breakage, vandalism or other causes.
2. Substantially constructed weather tight storage sheds, with raised floors, shall be provided and maintained as may be required to adequately protect those materials and products stored on the site which may require protection from damage by the elements.
3. Replacements: In the event of damage, immediately make all repairs and replacements necessary for the approval of the city representative and at no additional cost to the owner.

4. Equipment and products stored outdoors shall be supported above the ground on suitable wooden blocks or braces arranged to prevent excessive deflection or bending shall be stored with one end elevated to facilitate drainage.

5. Tarps and other coverings shall be supported above the stored equipment or materials on wooden strips to provide ventilation under the cover and minimize condensation. Tarps and covers shall be arranged to prevent ponding of water.

#### 1.03 EXTENDED STORAGE

In the event that certain items of major equipment such as air compressors, pumps, e.g., have to be stored for an extended period of time, the Contractor shall provide satisfactory long-term storage facilities which are acceptable to the Owner.

### **SECTION 00004**

#### PART 1 – GENERAL

##### 1.01 PROTECTION OF THE ENVIRONMENT

A. The Contractor shall be responsible for taking all measures required to minimize all types of pollution associated with the undertaking of the proposed work, and shall abide by the requirements of all governmental agencies having jurisdiction over the work or Contractor's project operations.

B. The Contractor shall protect all work including but not limited to excavation and trenches, from rain water, surface water and back-up of drains and sewers. The Contractor shall furnish all labor, pumps, shoring, enclosures and equipment necessary to protect and keep the work free of water. Completed work and stored products shall be suitably protected during unseasonable weather to allow work to proceed in a timely fashion. Work planned, or in progress, should be performed to minimize impact of adverse weather conditions.

C. Any area used or involved in the project that is disturbed by the Contractor, shall be restored to the original or better condition, even though such area is outside the limits of that specified for grading, grassing or landscaping.

# Appendix A

## OCC Requirements



## CITY OF ATLANTA

SUITE 1700

55 TRINITY AVENUE, SW

ATLANTA, GA 30303

(404) 330-6010 Fax: (404) 658-7359

Internet Home Page: [www.atlantaga.gov](http://www.atlantaga.gov)

Keisha Lance Bottoms  
Mayor

OFFICE OF CONTRACT COMPLIANCE

Larry Scott

Director

[lscott@atlantaga.gov](mailto:lscott@atlantaga.gov)

### MEMORANDUM

TO: Susan M. Garrett, Interim Chief Procurement Officer  
Department of Procurement

FROM: Larry Scott, Director *L. S.*  
Mayor's Office of Contract Compliance

RE: **EBO Documents for Project No.: FC-10337– Terrell Creek Trunk System  
Sewer Improvements**

DATE: **February 28, 2018**

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The EBO bid documents with project specific availability for Project No.: **FC-10337 – Terrell Creek Trunk System Sewer Improvements** are enclosed.

The entire OCC package, including both the standard and project specific EBO/EEO sections must be included in the bid documents. Please note that the enclosed package is solely for this project.

If there are questions, please contact me at (404) 330-6013, or **Bruce T. Bell** at (404) 330-6009.

cc: File  
**Sam Lipkins, OCC**  
**Arkeshia Hamlett, DOP**



## CITY OF ATLANTA

SUITE 1700

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Keisha Lance Bottoms  
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OFFICE OF CONTRACT COMPLIANCE

Larry Scott

Director

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February 28, 2018

**RE: Project No.: FC-10337 – Terrell Creek Trunk System Sewer Improvements**

Dear Prospective City of Atlanta Bidder:

The Office of Contract Compliance (OCC) information is an integral part of every eligible City of Atlanta bid. All Bidders are required to make efforts to ensure that businesses are not discriminated against on the basis of their race, ethnicity or gender, and to demonstrate compliance with these program requirements at or prior to the time of Bid opening, or upon request by OCC. Bidders are required to ensure that prospective subcontractors, vendors, suppliers and other potential participants are not denied opportunities to compete for work on a City contract on the basis of their race, ethnicity, or gender, and must afford all firms, including those owned by racial or ethnic minorities and women, opportunities to participate in the performance of the business of the City to the extent of their availability, capacity and willingness to compete. Please read all of the information very carefully. Pay close attention to the specific goals for minority and female business enterprise participation for this project and the EBO program reminders listed on page 6.

If you have any questions about the information included in this section of the solicitation, please contact the City of Atlanta Office of Contract Compliance at (404) 330-6010.

**The City of Atlanta looks forward to the opportunity to do business with your company.**

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**CITY OF ATLANTA**  
**EQUAL BUSINESS OPPORTUNITY (EBO)**  
**POLICY STATEMENT**

It is the policy of the City of Atlanta to promote full and equal business opportunity for all persons doing business with the City. The City must ensure that firms seeking to participate in contracting and procurement activities with the City are not prevented from doing so on the basis of the race or gender of their owners. The City is committed to ensuring that it is not a passive participant in any private scheme of discrimination. To ensure that businesses are not discriminated against with regard to prime contracting, subcontracting or other partnering opportunities with the City, the City has developed an Equal Business Opportunity (EBO) Program. It is also the policy of the City of Atlanta to actively promote equal employment opportunities for minority and female workers and prohibit discrimination based upon race, religion, color, sex, national origin, marital status, physical handicap or sexual orientation through the City's Equal Employment Opportunity (EEO) Program. The purpose of the Equal Business Opportunity and Equal Employment Opportunity Programs is to mitigate the present and ongoing effects of the past and present discrimination against women and minority owned businesses and women and minority workers so that opportunity, regardless of race or gender, will become institutionalized in the Atlanta marketplace. It is important to note that all bidders, without exception, including minority and female owned business enterprises, must comply with the City of Atlanta's EBO and EEO Program requirements. Goals for minority and female business enterprises are set for this project on page 6.



## **Implementation of EBO Policy**

The Office of Contract Compliance will review information submitted by Bidders pertaining to efforts to promote opportunities for diverse businesses, including M/FBEs, to compete for business as subcontractors and/or Suppliers. A Bidder is eligible to be further considered for award of a City contract upon a finding by OCC that the Bidder has engaged in, and provided with its bid submission documentation of efforts to ensure that its process of soliciting, evaluating and awarding subcontracts, placing orders, and partnering with other companies has been non-discriminatory. To assist prime contractors in this effort, the Office of Contract Compliance has set forth in this solicitation document the M/FBE goals within the relevant NAICS Codes, for this Project.

For subcontracting, the Subcontractor Project Plan must include **all** subcontractors (majority and minority owned) to be utilized on the project, detail the services to be performed, the dollar value of the work to be performed by each subcontractor, and the City of Atlanta M/FBE certification number and supplier id number as applicable.

For suppliers, the Subcontractor Project Plan must include **all** subcontractors (majority and minority owned), the supplies to be provided, including the dollar value of the supplies being provided and the City of Atlanta M/FBE certification number and supplier id number as applicable.

## **Determination of Non-discrimination During Bid Process**

No Bidder shall be awarded a contract on an Eligible Project unless the Office of Contract Compliance determines that the Bidder has satisfied the non-discrimination requirements of section 2-1448 on such Eligible Project. Accordingly, each Bidder shall submit with each Bid the following

1. Covenant of Non Discrimination. Each Bidder shall submit with her/his Bid a Covenant of Non-Discrimination which is set forth herein as Exhibit EBO1.
2. Outreach efforts documentation. Each bidder shall submit with her/his bid written documentation demonstrating the bidder's outreach efforts to identify, contact, contract with, or utilize businesses, including certified M/FBEs as subcontractors or suppliers on the contract. This information shall be set forth on Exhibit EBO2, which is included herein.
3. Subcontractor project plan. Each bidder shall submit with her/his bid a completed and signed subcontractor project plan, in a form approved and provided by the office of contract compliance, which lists the name, address, telephone number and contact person of each subcontractor or other business to be used in the contract, the NAICS Code and the type of work or service each business will perform, the dollar value of the work and the scope of work, the ownership of each business by race and gender, if applicable the AABE, APABE, HABE, or FBE certification number of each business, and any other information requested by the office of contract compliance. In order for the office of contract compliance to officially consider a firm to be an M/FBE, the M/FBE firm must be certified by or have a certification application pending with the office of contract compliance prior to the bidder's submission of the bid. The subcontractor project plan shall not be changed or altered after approval of the plan and award of the contract without the written approval of the director of the office of contract compliance. A written letter to the director of the office of contract compliance requesting approval to change the subcontractor project plan must be submitted prior to any change in the plan or termination of an M/FBE's contract.

## **OCC Review of Bidder Submissions**

The Office of Contract Compliance shall determine whether a Bidder has satisfied the non-discrimination requirements of section 2-1448 based on its review of the Covenant of Non Discrimination, the Outreach Efforts Documentation, the Subcontractor Project Plan, and its review of other relevant facts and circumstances, including complaints received as part of the bid process. In reviewing the documents submitted by a Bidder to determine whether the Bidder has satisfied the non-discriminatory practices requirement of this section, the Office of Contract Compliance will consider, among other things, the total project dollars subcontracted to or expended for services performed by other businesses, including certified M/FBEs, whether such businesses perform Commercially Useful Functions in the work of the contract based upon standard industry trade practices, whether any amounts paid to Supplier businesses are for goods customarily and ordinarily used based upon standard industry trade practices, and the availability of certified M/FBEs within the relevant NAICS Codes for such Eligible Project.

(a)     **Receipt of Complaint of Discrimination in the Bid Process**

The office of contract compliance shall accept complaints of alleged discrimination during the bid process regarding any participant in the bid process. Where the complaint of discrimination is specific to the procurement which is under consideration by the city, the office of contract compliance may investigate said complaint, determine its validity, and determine whether the actions complained of impact the bidder's responsiveness on the specific procurement. Allegations of discrimination based on events, incidents or occurrences which are unrelated to the specific procurement will be placed in the bidder's file maintained in the vendor relations database and handled in accordance with the procedure established in the city's vendor relations subdivision, section 2-1465, et seq.

(b)     **Determination of Violation of EBO Process**

Where the office of contract compliance investigates a complaint of discrimination that is related to the specific bid process, the details of that investigation, including findings, shall be recorded and maintained in the vendor relations database, pursuant to section 2-1471.

(c)     **Office of Contract Compliance Determination of Non-Compliance**

When, based upon the totality of the circumstances, the office of contract compliance determines that a bidder fails to satisfy the requirements of section 2-1448(a) of a city bid solicitation, the director of the office of contract compliance shall present a written determination of non-compliance to the Chief Procurement Officer which states the determination and lists the reasons for the determination. A bid that does not comply with the requirements set forth in section 2-1448(a) shall be deemed non-responsive and rejected.

## **Equal Business Opportunity Program Bid/RFP Submittals**

The Office of Contract Compliance will make any determination of non-responsiveness. The covenant of non-discrimination, the outreach efforts documentation, the subcontractor project plan, and any other information required by OCC in the solicitation document pursuant to section 2-1448 must be completed in their entirety by each bidder and submitted with the other required bid documents in order for the bid to be considered as a responsive bid. Failure to timely submit these forms, fully completed, will result in the bid being considered as a non-responsive bid, and therefore, excluded from consideration.

### **Monitoring Of EBO Policy**

Upon execution of a contract with the City of Atlanta, the successful bidder's Subcontractor Project Plan will become a part of the contract between the bidder and the City of Atlanta. The Subcontractor Project Plan will be monitored by the City of Atlanta's Office of Contract Compliance for adherence with the plan. The successful bidder will be required to provide specific EBO information on a monthly basis that demonstrates the use of subcontractors and suppliers as indicated on the Subcontractor Project Plan. The failure of the successful bidder to provide the specific EBO information by the specified date each month shall be sufficient cause for the City to withhold approval of the successful bidder's invoices for progress payments, increase the amount of the successful bidder's retainage, require joint check issuance, or evoke any other penalties as set forth in the City of Atlanta Code of Ordinances, Sections 2-1452 and 2-1456.

### **Implementation of EEO Policy**

The City effectuates its EEO policy by adopting racial and gender work force availability for every contractor performing work for the City of Atlanta. These percentages are derived from the work force demographics set forth in the 2010 Census EEO file prepared by the United States Department of Commerce for the applicable labor pool normally utilized for the contract.

### **Monitoring of EEO Policy**

Upon award of a contract with the City of Atlanta, the successful bidder must submit a Contract Employment Report (CER), describing the racial and gender make-up of the firm's work force. If the CER indicates that the firm's demographic composition does not meet the adopted EEO goals, the firm will be required to submit an affirmative action plan setting forth the steps to be taken to reach the adopted goals. The CER and the affirmative action plan, if necessary, will become a part of the contract between the successful bidder and the City of Atlanta. Compliance with the EEO requirements will be monitored by the Office of Contract Compliance.

## **Joint Venture Participation on City of Atlanta Projects**

The City of Atlanta encourages, where economically feasible, the establishment of joint ventures to ensure prime contracting opportunities for all businesses, including good faith outreach efforts to utilize certified minority and female business enterprises on Eligible Projects. On projects valued at five (5) million dollars or greater, the Office of Contract Compliance shall determine on a project-by-project basis whether non-discriminatory outreach efforts to enter into a joint venture shall be required. On such Eligible Projects, joint venture member businesses must have different race ownership, different gender ownership or both. The minority and female business enterprise members of the joint venture on projects on which a Joint Venture is required must be certified as such by the Office of Contract Compliance, and the joint venture team shall include in its bid submittal the MBE or FBE certification number of each MBE or FBE joint venture member. **OCC has made the determination non-discriminatory outreach efforts to enter into a joint venture are required for this solicitation.**

No bid on a City contract for an Eligible Project shall be accepted from a joint venture team unless each participant independently signs and submits a Covenant of non-discrimination (EBO-1)

A joint venture may submit its agreement to the Office of Contract Compliance for pre-approval no later than fourteen (14) calendar days prior to the date set for receipt of bids on an Eligible Project. Otherwise, agreements must be submitted on or before the date set for receipt of bids on an Eligible Project.

### Components of a Joint Venture Agreement

The Joint Venture agreement should include at a minimum:

- The name of the Joint Venture
- Contact information of designated primary JV contact person
- Identification of all firms participating in the JV
- The initial capital investment of each venture partner
- Terms and conditions under which future contributions may be necessary
- The proportional allocation of profits and losses to each venture partner
- Description of proportion of work controlled by and management of the joint venture team members
- The method of, and responsibility for, accounting
- Frequency of JV meetings and method for minutes taking and storage
- The methods by which disputes are resolved.
- Provide the specific citation/section of your JV that speaks to the Contract's non-discrimination and assurance requirements
- All other pertinent factors of the joint venture.



**City of Atlanta Office of Contract Compliance**  
**Joint Venture Information Pre-Award Review-EBO**

**Proponent Instructions:** All Proponents must use their executed proposed JV agreement to complete the questions below (Attach additional pages if needed):

1. Name of Joint Venture:
  
2. Name, address and phone number of joint venture contact person serving as managing partner:
  
3. Firms participating in joint venture (use additional pages if necessary):

Name of firm:

Address:

Office Phone Number:

Primary Contact name/phone number:

% ownership: \_\_\_\_\_%

M/FBE: ☐ No

☐ Yes

Date of Certification:

NAICS code(s) for which certification was granted:

Name of firm:

Address:

Office Phone Number:

Contact name/phone number:

% ownership: \_\_\_\_\_%

M/FBE: ☐ No

☐ Yes

Date of Certification:

NAICS code(s) for which certification was granted:

4. Was there an M/FBE initial capital contribution required? Amount? \_\_\_\_\_
5. Does the JV document describe the portion of the work or elements of the business controlled by the M/FBE JV team member(s)? ☐  
No ☐ Yes Referenced in What Section?
6. Does the JV document describe the portion of the work or elements of the business controlled by the non-M/FBE JV team member(s)? ☐  
No ☐ Yes Referenced in What Section?
7. Does the JV document describe the M/FBE team member's involvement in the overall management of the joint venture. (e.g., participation on a management committee or managing board, voting rights, etc.)? ☐ No ☐ Yes  
Referenced in What Section?
8. Does the JV document list the M/FBE team member's share in the profits/risk in the joint venture: ☐ No ☐ Yes Referenced in What Section?
9. Does the JV document describe the roles and responsibilities of each joint venture participant with respect to operation of the joint venture (use additional sheets if necessary): ☐ No ☐ Yes Referenced in What Section?
- a. Majority interest holder joint venture participant:
- b. Minority interest holder joint venture participant(s):

10. Does the JV document detail which firm will be responsible for accounting functions relative to the joint venture's business? ☐

No ☐ Yes ☐ Referenced in What Section?

11. Does the JV document explain what authority each party will have to commit or obligate the other to insurance and bonding companies, financing institutions, suppliers, subcontractors, and/or other parties? ☐ No ☐ Yes Referenced in What Section?

12. Did the JV document provide the name of the person who will be responsible for hiring employees for the joint venture. ☐ No ☐ Yes Referenced in What Section?

13. Did The JV Describe the frequency of JV meetings, method for minutes taking, and storage for audit provisions? ☐ No ☐ Yes Referenced in What Section?

14. Are any of the proposed joint venture employees currently employees of any of the joint venture partners? ☐ No ☐ Yes If yes, list the number and positions and indicate which firm currently employs the individual(s)?

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15. Did the JV Detail the methods by which disputes are resolved?  
☐ No ☐ Yes Referenced in What Section?

16. Is a copy of the proposed joint venture agreement, promissory note(s), and loan agreement(s) (if applicable), and any and all written agreements between the joint venture partners included in the proposal submission ☐ No ☐ Yes Referenced in What Section?

17. Does the JV document describe all other business relationships between the joint venture participants, including other joint venture agreements in which the parties are jointly involved? ☐ No ☐ Yes Referenced in What Section?
18. Does the JV document provide a specific citation/section that speaks to the non-discrimination and assurance requirements related to this solicitation? ☐ No ☐ Yes Referenced in What Section?

Additional Comments:

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## **Equal Business Opportunity M/FBE GOALS for this Project**

### **Project No.: FC-10337 – Terrell Creek Trunk System Sewer Improvements**

Part 1: All proponents must ensure that non-discriminatory practices are utilized to enter into a Joint Venture Agreement in accordance with the City of Atlanta's EBO/SBO Ordinance. The Joint Venture Agreement, at the very least, should reflect details of the member company's/companies' involvement in the.: **Terrell Creek Trunk System Sewer Improvements** project throughout the life of the contract. (See Page 6)

Part 2: All proponents must ensure that non-discriminatory practices are utilized during efforts to engage minority and female subcontractors and suppliers throughout the life of the contract. All outreach efforts must be documented and included with this bid submittal.

The dominant NAICS code and trade to be engaged for the above referenced phase is:

### **237110 Water & Sewer Line & Related Structures Construction**

The above referenced dominant NAICS code was used for the purposes of calculating the appropriate participation goal(s). However, any COA certified firm that is engaged by the successful Prime proponent who performs a commercially useful function in the execution of the project will be eligible for participation credit. The availability of certified M/FBE firms for the procurement categories in the various scopes associated with this project is:

**26.7% MBE & 11.1% FBE**

Please be reminded that no Bidder shall be awarded a contract on an Eligible Project unless the Office of Contract Compliance determines that the Bidder has satisfied the non-discrimination requirements of section 2-1448 on such Eligible Project. Details of the O.C.C. review process for determination of non-discrimination are outlined on page 3 of this document.

**Note:** Each Joint Venture (JV) team(s) must include a signed/notarized copy of their JV agreement with their bid submission. Each JV team must consist of at least one City of Atlanta certified M/FBE partner.

OCC will count M/FBE participation in the form of a certified joint venture partner (self-performing a scope of work), and certified M/FBE subcontractor arrangements. The above referenced goal will be measured against **total contract value inclusive of any change orders and/or miscellaneous modifications** that may occur throughout the life of the project.

## **Equal Business Opportunity Program Reminders for This Solicitation**

1. **Certification.** It is the prime contractor's responsibility to verify that MBEs and FBEs included on the Subcontractor Project Plan are certified by the City of Atlanta's Office of Contract Compliance, or have a certification application pending with the City of Atlanta's Office of Contract Compliance.
2. **Joint Venture Agreements.** The Joint Venture member businesses must have different race ownership, different gender ownership, or both. MFBE members of the Joint Venture must be certified as such by the Office of Contract Compliance. The Joint Venture team shall include in its submittal the MFBE certification number of each MFBE Joint Venture member.
3. **Subcontractor Contact Form.** It is required that bidders list and submit information on all subcontractors they solicit for quotes, all subcontractors who contact them with regard to the project, and all subcontractors they have discussions with regarding the project. Failure to provide complete information on this form will result in your bid being declared non-responsive. For your convenience, fillable versions of the Appendix A documents are available on the OCC webpage should you require additional pages.
4. **Reporting.** The successful bidder must submit monthly EBO participation reports to the Office of Contract Compliance in a manner as prescribed by the OCC contract monitor of record.
5. **SBO/EBO Ordinance.** The EBO Program is governed by the provisions of the SBO/EBO Ordinance set forth in the City of Atlanta Code Division 12, section 2 - 1356 through 2 -1480. The ordinance can be obtained from the City of Atlanta Clerk's Office at (404) 330-6032.
6. **Supplier Participation.** In order to receive full M/FBE credit, suppliers must manufacture or warehouse the materials, supplies, or equipment being supplied for use on the Eligible Project.
7. **OCC Registry of Certified Firms.** To access OCC's real time registry of vendors (certified or non-certified), visit our PRISM Compliance Management portal at: <http://atlanta.prismcompliance.com/DirectRequest.ashx?t=100&j=jggizwSWWYnRk55uW%2Bjjonkgm04tizEb>. You may search by "Industry" for a list of firms in that category or search for a specific company under "Company Name". You may also go to the website: [www.atlantaga.gov/contractcompliance](http://www.atlantaga.gov/contractcompliance) and scroll down to the section heading "Registry of Certified Firms" Click OCC's quarterly list to access the current directory of certified firms.

### **COVENANT OF NON-DISCRIMINATION**

The undersigned understands that it is the policy of the City of Atlanta to promote full and equal business opportunity for all persons doing business with the City of Atlanta. The undersigned covenants that we have not discriminated, on the basis of race, gender or ethnicity, with regard to prime contracting, subcontracting or partnering opportunities. The undersigned further covenants that we have completed truthfully and fully the required forms EBO-2 and EBO-3. Set forth below is the signature of an officer of the bidding entity with the authority to bind the entity.

\_\_\_\_\_  
Signature of Attesting Party

\_\_\_\_\_  
Title of Attesting Party

On this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me appeared \_\_\_\_\_, the person who signed the above covenant in my presence.

\_\_\_\_\_  
Notary Public

Seal

**FORM EBO-1**

## SUBCONTRACTOR CONTACT FORM

List *all subcontractors or suppliers* (Majority, EBO and Non-EBO Certified) that were contacted regarding this project.

Name of Sub-contractor/ Supplier/JV Partner	Contact Name, Address and Phone Number	City Of Atlanta Business License? (Yes or No)	Scope of Work Solicited for	Solicited for JV? (Yes or No)	Business Ownership (see code below)	M/FBE Certification No. and Expiration Date	Results of Contact

<b>Name of Sub-contractor/ Supplier/JV Partner</b>	<b>Contact Name, Address and Phone Number</b>	<b>City Of Atlanta Business License? (Yes or No)</b>	<b>Scope of Work Solicited for</b>	<b>Solicited for JV? (Yes or No)</b>	<b>Business Ownership (see code below)</b>	<b>M/FBE Certification No. and Expiration Date</b>	<b>Results of Contact</b>

Business Ownership Code: AABE - African American Business Enterprise, HABE – Hispanic Business Enterprise, FBE – Female Business Enterprise, APABE – Asian (Pacific Islander) American Business Enterprise (SBE and DBE Certifications will not suffice for this procurement)

**Company Name:** \_\_\_\_\_ **Project Name:** \_\_\_\_\_ **FC#:** \_\_\_\_\_

**Printed Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## EQUAL BUSINESS OPPORTUNITY SUBCONTRACTOR PROJECT PLAN SUBCONTRACTOR/SUPPLIER UTILIZATION

List all Majority, EBO Certified, and Non-EBO Certified subcontractors/suppliers, including lower tiers, to be used on this project.

Name of Sub-contractor/ Supplier	Contact Name, Address and Phone Number	City of Atlanta Business License? (yes or no)	Joint Venture Partner? (yes or no)	NAICS Code	Scope of Work to be Performed	Ethnicity of M/FBE Ownership (see code below)	M/FBE Certification No. and Expiration Date	Dollar (\$) Value of Work and Scope of Work	Percentage (%) of Total Bid Amount

**Total MBE%\_\_\_\_\_ Total FBE%\_\_\_\_\_ Total EBO%\_\_\_\_\_**

Code: AABE - African American Business Enterprise, HABE – Hispanic American Business Enterprise, FBE – Female Business Enterprise,  
APABE – Asian (Pacific Islander) American Business Enterprise (SBE and DBE Certifications will not suffice for this procurement)

**Proponent Company Name:** \_\_\_\_\_ **Project Name:** \_\_\_\_\_ **FC#:** \_\_\_\_\_

**Proponent's Contact Number:**\_\_\_\_\_ **Proponent Name (Printed)**\_\_\_\_\_ **Date:** \_\_\_\_\_

**LETTER OF INTENT**

FC# \_\_\_\_\_

**Proponent**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**Subcontracting Firm:**

Firm Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**Sub firm Contact Person:**

Name: \_\_\_\_\_ Phone: (\_\_\_\_) \_\_\_\_\_

**Firm is performing as:**

☐

Non-certified Sub

☐

Certified Sub

☐

Joint Venture Team Member

If Certified, Certification # and Expiration Date: \_\_\_\_\_

Work item(s) to be performed by Sub	Description of Work Item	Dollar(s) Value of Work and Scope of Work	Percentage (%) of Total Bid Amount
TOTAL Diversity% Credit Claimed for this Contractor			

The bidder/offeror is committed to utilizing the above-named Subcontractor firm for the work described above. The estimated participation is as follows:

Sub contract amount: \$ \_\_\_\_\_ Percent of total contract: \_\_\_\_\_%

**AFFIRMATION:**

The above-named Subcontractor firm affirms that it will perform the portion of the contract for the estimated dollar value as stated above.

By: \_\_\_\_\_  
(Print name) (Title)

\_\_\_\_\_  
(signature) (date)

*\* In the event the bidder/offeror does not receive award of the prime contract, any and all representations in this Letter of Intent and Affirmation shall be null and void*

(THIS PAGE SHALL BE SUBMITTED FOR EACH SUB FIRM)

## LETTER OF INTENT

FC# \_\_\_\_\_

**Proponent**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**Subcontracting Firm:**

Firm Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**Sub firm Contact Person:** Name: \_\_\_\_\_ Phone: (\_\_\_\_) \_\_\_\_\_

**Firm is performing as:** ☐ Non-certified Sub ☐ Certified Sub ☐ Joint Venture Team Member

If Certified, Certification # and Expiration Date: \_\_\_\_\_

Work item(s) to be performed by Sub	Description of Work Item	Dollar(s) Value of Work and Scope of Work	Percentage (%) of Total Bid Amount
TOTAL Diversity% Credit Claimed for this Contractor			

The bidder/offeror is committed to utilizing the above-named Subcontractor firm for the work described above. The estimated participation is as follows:

Sub contract amount: \$ \_\_\_\_\_ Percent of total contract: \_\_\_\_\_%

**AFFIRMATION:**

The above-named Subcontractor firm affirms that it will perform the portion of the contract for the estimated dollar value as stated above.

By: \_\_\_\_\_  
(Print name) (Title)

\_\_\_\_\_  
(signature) (date)

*\* In the event the bidder/offeror does not receive award of the prime contract, any and all representations in this Letter of Intent and Affirmation shall be null and void*



**DIVERSITY FIRM TERMINATION/SUBSTITUTION  
ACKNOWLEDGEMENT FORM**

As a participant in an eligible City of Atlanta (COA) diversity program contract, certain restrictions and procedures apply to the termination and substitution of a diversity certified entity by a prime concessionaire or prime contractor, as mandated by federal regulations and City ordinances. These requirements are established by 49 C.F.R. § 26.53(f), code sections 2-1356- 2-1380, and 2-1441- 2-1480 of the COA code of ordinances, as may be amended from time to time.

OCC will not allow a prime concessionaire or prime contractor to substitute or terminate a diversity program certified entity without OCC's prior written consent, which will be granted only upon a written finding of good cause. OCC requires completion of a form document to accompany the reason(s) for the request to terminate and/or substitute, which is available at:

<http://www.atlantaga.gov/modules/showdocument.aspx?documentid=491>

For ease of reference, the federal requirements are quoted below:

49 C.F.R. § 26.53(f)

- (1) (i) [OCC] must require that a prime contractor not terminate a DBE/[ACDBE] subcontractor listed in response to paragraph (b)(2) of this section (or an approved substitute DBE/[ACDBE] firm) without [OCC's] prior written consent. This includes, but is not limited to, instances in which a prime contractor seeks to perform work originally designated for a DBE/[ACDBE] subcontractor with its own forces or those of an affiliate, a non-DBE/[ACDBE] firm, or with another DBE/[ACDBE] firm.
- (ii) [OCC] must include in each prime contract a provision stating:
  - (A) That the contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the contractor obtains your written consent as provided in this paragraph (f); and
  - (B) That, unless your consent is provided under this paragraph (f), the contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE/[ACDBE].
- (2) [OCC] may provide such written consent only if [OCC] agree[s], for reasons stated in [OCC's] concurrence document, that the prime contractor has good cause to terminate the DBE/[ACDBE] firm.
- (3) For purposes of this paragraph, good cause includes the following circumstances:
  - (i) The listed DBE/[ACDBE] subcontractor fails or refuses to execute a written contract;
  - (ii) The listed DBE/[ACDBE] subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE/[ACDBE] subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;
  - (iii) The listed DBE/[ACDBE] subcontractor fails or refuses to meet the prime contractor's reasonable, nondiscriminatory bond requirements.
  - (iv) The listed DBE/[ACDBE] subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
  - (v) The listed DBE/[ACDBE] subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1,200 or applicable state law;
  - (vii) [OCC] ha[s] determined that the listed DBE/[ACDBE] subcontractor is not a responsible contractor;
  - (vi) The listed DBE/[ACDBE] subcontractor voluntarily withdraws from the project and provides to [OCC] written notice of its withdrawal;
  - (vii) The listed DBE/[ACDBE] is ineligible to receive DBE/[ACDBE] credit for the type of work required;
  - (viii) A DBE/[ACDBE] owner dies or becomes disabled with the result that the listed DBE/[ACDBE] contractor is unable to complete its work on the contract;
  - (ix) Other documented good cause that [OCC] determine[s] compels the termination of the DBE/[ACDBE] subcontractor. Provided, that good cause does not exist if the prime contractor seeks to terminate a DBE/[ACDBE] it relied upon to obtain the contract so that the prime contractor can self-perform the work for which the DBE/[ACDBE] contractor was engaged or so that the prime contractor can substitute another DBE/[ACDBE] or non-DBE/[ACDBE] contractor after contract award.
- (4) Before transmitting to [OCC] its request to terminate and/or substitute a DBE/[ACDBE] subcontractor, the prime contractor must give notice in writing to the DBE/[ACDBE] subcontractor, with a copy to [OCC], of its intent to request to terminate and/or substitute, and the reason for the request.
- (5) The prime contractor must give the DBE/[ACDBE] five days to respond to the prime contractor's notice and advise [OCC] and the contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why [OCC] should not approve the prime contractor's action. If required in a particular case as a matter of public necessity (e.g., safety), [OCC] may provide a response period shorter than five days.
- (6) In addition to post-award terminations, the provisions of this section apply to pre-award deletions of or substitutions for DBE/[ACDBE] firms put forward by offerors in negotiated procurements.

The undersigned acknowledges these requirements on behalf of the below-listed entity.

Prime: \_\_\_\_\_

Contract No.: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



### **AWSG Determination of Applicability**

It is the policy of the City of Atlanta to provide job opportunities to the residents of the City of Atlanta, whenever possible. Whereas every contract with the City of Atlanta creates a potential pool of new employment opportunities, the following program is applicable to **construction projects only** and is subject to review by the Atlanta WorkSource Georgia Agency (WorkSource Atlanta) team on a case by case basis for applicability. Once WorkSource Atlanta has made the determination that the First Source Jobs Program is applicable, the successful prime contractor (and all subcontractors associated with the awarded project) are expected to work with WorkSource Atlanta to fill at least 50% of all new entry-level jobs, which arise from this project, with residents of the City of Atlanta. **WorkSource Atlanta has determined that the first source Jobs program is applicable for this project.** For more specific information about the First Source Jobs Program contact:

**Audrey Lawrence  
First Source Jobs Program  
Atlanta WorkSource Georgia Agency  
818 Pollard Boulevard  
Atlanta, GA 30315  
(404) 546-3000**



## **First Source Jobs Program**

### **Policy Statement**

Every contract with the City of Atlanta creates employment opportunities for the City's residents.

Contractors who enter into a contract with the City of Atlanta for performance of work that requires construction or building trades skills in which the prime contract is \$500,000.00 or greater and the sub-contract(s) is \$250,000.00 or greater will make good faith efforts to fill 50% of all new entry-level construction positions with City of Atlanta residents who are listed on the WorkSource Atlanta's First Source Registry.

WorkSource Atlanta has determined that the First Source Jobs program is applicable for this project.

### **Process**

WorkSource Atlanta evaluates each contract to determine whether the First Source Jobs Program is applicable.

Each prospective contractor must follow the steps below after a contract is deemed applicable:

- Sign and submit the "Letter of Assent" affirming that the contractor has read the First Source Job Training and Employment Placement Agreement and agrees to the terms therein with the completed bid package.
- Meet with WorkSource Atlanta representatives upon receiving a "Notice to Proceed" to discuss the entry level construction positions that need to be filled and the steps required for compliance with the First Source Jobs Program.
- Provide WorkSource Atlanta with the "Employer Projection of Positions Form" at least (10) days prior to hiring for any Construction positions which shall contain a list of all New Construction Positions for which the Construction General Contractor is hiring, as well as the job qualifications for those positions.
- Evaluate and interview all candidates referred by WorkSource Atlanta and provide WorkSource Atlanta with the "Post-Interview Evaluation Form" for each candidate within ten (10) days of the evaluation & interview.
- Provide WorkSource Atlanta the following items with the submittal of each payment application for the Construction Contract documenting the Construction General Contractor's as well as the Sub-contractor's efforts to comply with this Agreement:
  - A copy of all completed "Employer Projection of Positions Forms" which have been completed since the last requisition submitted;
  - A copy of all completed "Post-Interview Evaluation Forms" which have completed since the last requisition submitted; and
  - The completed "Requisition Progress Report" which has been completed since the last requisition submitted.

### **Benefits of the First Source Jobs Program**

As the workforce system for the City of Atlanta, WorkSource Atlanta collaborates with businesses, economic development entities, educational institutions and community organizations to ensure that the City's workforce meets the needs of the business community. WorkSource Atlanta will identify pre-qualified candidates with industry recognized credentials or candidates with equivalent work experience to reduce time in recruiting candidates for entry level positions created as a result of this contract at no cost to the contractor.



**AGREEMENT FOR**

**FC-10337 – TERRELL CREEK TRUNK SYSTEM SEWER IMPROVEMENTS**

**WORKSOURCE ATLANTA**

**FIRST SOURCE JOB TRAINING AND EMPLOYMENT PLACEMENT PROGRAM**

**WHEREAS**, Ordinance 10-O-0928, which created the City of Atlanta’s First Source Job Training and Employment Placement Program, was adopted by the Atlanta City Council on February 4, 2013 and approved by the Mayor of Atlanta on February 13, 2013; and,

**WHEREAS**, according to the most recent U.S. Census Bureau statistics, some twenty-five percent (25%) of the City of Atlanta’s residents live below the federal poverty level; and,

**WHEREAS**, the City of Atlanta, through implementation of the Program, desires to address the issues of poverty, unemployment, and underemployment by providing meaningful job and career opportunities to the city’s residents; and,

**WHEREAS**, the City of Atlanta enters into numerous public works and improvement contracts that are funded by public tax dollars; and,

**WHEREAS**, various building and construction workers are required to fulfill and perform the work required under said contracts; and,

**WHEREAS**, in order to facilitate the successful implementation of the Program, WorkSource Atlanta and the Construction GC desire to enter into this Agreement to set forth the respective responsibilities and obligations of each party for the duration of the Construction Contract as entered into between the City of Atlanta and the Construction GC.

**NOW, THEREFORE**, in consideration of the mutual covenants contained herein, WorkSource Atlanta and the Construction GC hereby agree as follows:

**Section 1. Definitions.** The following italicized terms shall have the following meanings. All definitions include both the singular and plural forms.

*Construction Contract* shall mean a contract entered into or funded by the City for the performance of work that requires construction or building trades skills and has a face value greater than the Threshold Amount.

*Construction General Contractor* (“Construction GC”) shall mean any entity entering into a Construction Contract that exceeds the Threshold Amount.

*Entry-level* shall mean any non-managerial position that requires either no education above a high school diploma or certified equivalency, or less than two (2) years of training or specific preparation. This definition includes, but is not limited to apprentices.



*First Source Register* shall mean the register managed by WorkSource Atlanta providing the Construction GC and its Sub-contractors with Workforce Innovation and Opportunity Act (WIOA) eligible residents of the City of Atlanta from which to fill Entry-level construction positions.

*New Construction Position* shall mean any non-executive, non-professional engineering, non-office, or non-clerical job, or any job not filled by full-time employees on the Construction GC's payroll for at least three months prior to the Notice to Proceed for the Construction Contract.

*Sub-contractor* shall mean any contractor performing construction work either directly or indirectly for the Construction GC, pursuant to any Construction Contract and that meets the Threshold Amount.

*Threshold Amount* shall mean any Construction Contract in which the prime contract is \$500,000.00 or greater and the sub-contract(s) is \$250,000.00 or greater.

*Workforce Innovation and Opportunity Act* ("WIOA") shall refer to Public Law 113-128, passed by the U.S. Congress and signed into law by President Barack Obama in July 2014. The Act reauthorized the Workforce Investment Act of 1998. WIOA is a federal grant program designed to help job seekers access employment, education, training, and support services to succeed in the labor market and to match employers with the skilled workers.

## **Section 2. General.**

- A. Construction GC shall use, and shall cause the Construction GC's Sub-contractors to use, WorkSource Atlanta as its first source for the recruitment, referral, and placement of New Construction Positions through the First Source Register subject to the terms of this Agreement.
- B. WorkSource Atlanta will provide recruitment, referral, and placement services through the First Source Register to the Construction GC and its Sub-contractors.

## **Section 3. Responsibilities of WorkSource Atlanta.**

WorkSource Atlanta shall:

- A. Provide recruitment and referral to the Construction GC and Sub-contractor(s), subject to the limitations set out in this Agreement.
- B. Screen applicants and provide Construction GC and Sub-contractor(s) with a list of applicants according to the terms of this Agreement.

## **Section 4. Responsibilities of the Construction GC.**

The Construction GC shall, and shall cause its Sub-contractor(s) to:

- A. For all new entry-level Construction Positions, review and interview job applicants exclusively from the First Source Register prior to reviewing job applicants from any other source.



- B.** Make good faith efforts to fill fifty (50) percent of entry-level positions with City of Atlanta residents who are listed on the First Source Registry.
- C.** Provide WorkSource Atlanta with Employer Projection of Positions Form (“Exhibit A”), which shall contain a list of all New Construction Positions for which the Construction GC is hiring, as well as the job qualifications for those positions. This notification shall occur after the Construction Contract has been awarded and before the Notice to Proceed (“NTP”) is issued.
- D.** After issuance of the NTP, provide a final Employer Projection of Positions Form (“Exhibit A”) to WorkSource Atlanta.
- E.** Provide names and position titles of all Non-New Construction Positions (“Exhibit B”). Non-New Construction Positions include any executive, professional engineering, office, or clerical jobs, or any jobs filled by full-time salaried employees on the Construction GC’s payroll for at least three months prior to the notice to proceed. This list shall be deemed exempted positions.
- F.** Include provisions in all Construction Contracts entered into with Sub-contractors to represent and warrant adherence to the terms of this Agreement.
- G.** Provide letters of assent (“Exhibit C”) to the terms of this Agreement to WorkSource Atlanta prior to any Construction GC performing any work on the Project.
- H.** Evaluate and interview all candidates provided by WorkSource Atlanta from the First Source Register and provide WorkSource Atlanta with the Post-Interview Evaluation Form (“Exhibit D”), within ten (10) days of the evaluation and interview.
- I.** Provide WorkSource Atlanta with a completed Requisition Progress Report (“Exhibit E”) certifying compliance with this Agreement and detailing individuals who were hired, their address, start and end employment dates, and hours worked during that month.
- J.** Maintain daily sign-in sheet logs and payroll records for all of its employees and make said sign-in sheet logs and payroll records available to WorkSource Atlanta upon request. WorkSource Atlanta shall not use such records for any purpose other than monitoring of compliance with this Agreement.
- K.** Submit to WorkSource Atlanta with each payment application for the Construction Contract, the following items:
  - (i) A copy of all completed Employer Projection of Positions Forms (“Exhibit A”) which have been completed since the last requisition submitted;

- (ii) A copy of all completed Post-Interview Evaluation Forms (“Exhibit D”) which have been completed since the last requisition submitted; and
- (iii) The completed Requisition Progress Report (“Exhibit E”) which has been completed since the last requisition submitted.

**Section 5. Nondiscrimination.** No party to this Agreement shall discriminate against First Source Register referrals in any terms and conditions of employment, including retention, promotions, job duties, shift assignments, and training opportunities.

**Section 6. Events of Default.** Subject to construction schedules and safety requirements, WorkSource Atlanta, the Office of Contract of Compliance (“OCC”), and awarding departments shall have the right to engage in random inspections of job sites and have access to the employees of the Construction Contractor or Sub-contractor(s) and the records required under Ordinance 10-O-0928 (City of Atlanta Code of Ordinances, ARTICLE XI).

If WorkSource Atlanta, OCC, or an awarding department determines the Construction GC and/or Sub-contractor(s) are not in compliance with this Agreement, any or all of the following actions may be taken:

- Withhold progress payments of up to 10% of the Contract Amount;
- Refusal of all future bids on City projects until such time as the Construction GC and/or Sub-contractor come into compliance with this Agreement; or
- Termination of the Agreement.

**Section 7. Notices.** All notices, consents, approvals and other communications which may be or are required to be given by WorkSource Atlanta or the Construction GC under this Agreement shall be properly given only if made in writing and sent by (a) hand delivery, or (b) certified mail, return receipt requested, or (c) a nationally recognized overnight delivery service (such as Federal Express, UPS Next Day Air or Airborne Express), (d) by email to the email address listed below (provided that a copy of such notice is also delivered within 24 hours to the party by one of the methods listed in this Section 6(a), (b) or (c)), or (e) by facsimile to the facsimile number listed below (provided that a copy of such notice is also delivered within 24 hours to the party by one of the other methods listed in this Section 6(a), (b) or (c)), with all postage and delivery charges paid by the sender and addressed to the other parties as applicable as set forth below. Said notice addresses are as follows:



If notice is to City:

WorkSource Atlanta  
818 Pollard Blvd., SW  
Atlanta, GA 30315  
ATTN: Director of Performance Management  
[paolaleye@atlantaga.gov](mailto:paolaleye@atlantaga.gov)

If notice is to Construction GC:

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Each party may change its address by written notice in accordance with this Section (effective five (5) days after the delivery of written notice thereof). Any communication addressed and mailed in accordance with this Section will be deemed to be given when received, unless rejected or returned by the recipient, in which case when mailed, any notice so sent by electronic or facsimile transmission will be deemed to be given when receipt of such transmission is acknowledged, and any communication so delivered in person will be deemed to be given when received for, or actually received, by the party identified above.

**Section 7. Amendments and Waivers.** Any provision of this Agreement may be amended or waived if such amendment or waiver is in writing and is signed by the parties hereto. No course of dealing on the part of any party to this Agreement, nor any failure or delay by any party to this Agreement with respect to exercising any right, power, or privilege hereunder will operate as a waiver thereof.

**Section 8. Invalidity.** In the event that any provision of this Agreement is held unenforceable in any respect, such unenforceability will not affect any other provision of this Agreement.

**Section 9. Successors and Assigns.** This Agreement shall be binding upon the parties hereto and their respective successors and assigns and shall inure to the benefit of the parties hereto and their respective permitted successors and assigns. The Construction GC may not assign this Agreement or any of its rights hereunder or any interest herein without the prior written consent of WorkSource Atlanta, which consent may be withheld or conditioned in the sole discretion of WorkSource Atlanta; provided, however, that WorkSource Atlanta will not unreasonably withhold its consent to an assignment by the Construction GC of all or any of its rights under this Agreement.

**Section 10. Exhibits; Titles of Articles and Sections.** The exhibits attached to this Agreement are incorporated herein and will be considered a part of this Agreement for the purposes stated herein, except that in the event of any conflict between any of the provisions of such exhibits and the provisions of this Agreement, the provisions of this Agreement will prevail. All titles or headings are only for the convenience of the parties and may not be construed to have any effect or meaning as to the Agreement between the parties hereto. Any reference herein to a Section or subsection will be considered a reference to such Section or subsection of this Agreement unless otherwise stated. Any reference herein to an exhibit will be considered a reference to the applicable exhibit attached hereto unless otherwise stated.





**Section 11. Applicable Law.** This Agreement is made under and will be construed in accordance with and governed by the laws of the State of Georgia.

No provision of this agreement shall be interpreted so as to require the Construction GC and/or Sub-contractor(s) to employ a worker not qualified for a position, or to employ or retain any particular employee, or to hire any worker as a result of such worker's membership in a labor union.

**Section 12. Entire Agreement.** This Agreement represents the final agreement between the parties and may not be contradicted by evidence of prior, contemporaneous, or subsequent oral agreements of the parties. There are no unwritten oral agreements between the parties.

**Section 13. Termination of Agreement.** Without cause, WorkSource Atlanta may terminate this agreement at any time upon thirty (30) days' written notice to the Construction GC and WorkSource Atlanta.



CONSTRUCTION GC / SUB-CONTRACTOR LETTER OF ASSENT

I have read the First Source Job Training and Employment Placement Agreement and assent to the terms therein.

\_\_\_\_\_  
Construction GC or Sub-Contractor

\_\_\_\_\_  
Company Representative

\_\_\_\_\_  
Date

# Appendix B

## Insurance Requirements

APPENDIX B  
**INSURANCE & BONDING REQUIREMENTS**  
**FC-10337 Terrell Creek Trunk System Sewer Improvements**

A. Preamble

The following requirements apply to all work under the agreement. Compliance is required by all Contractors/Consultants. **To the extent permitted by applicable law, the City of Atlanta ("City") reserves the right to adjust or waive any insurance or bonding requirements contained in this Appendix B and applicable to the agreement.**

1. Evidence of Insurance Required Before Work Begins

**No work under the agreement may be commenced until all insurance and bonding requirements contained in this Appendix B, or required by applicable law, have been complied with and evidence of such compliance satisfactory to City as to form and content has been filed with City.** Contractor/Consultant must provide City with a Certificate of Insurance that clearly and unconditionally indicates that Contractor/Consultant has complied with all insurance and bonding requirements set forth in this Appendix B and applicable to the agreement. If the Contractor/Consultant is a joint venture, the insurance certificate should name the joint venture, rather than the joint venture partners individually, as the primary insured. In accordance with the solicitation documents applicable to the agreement at the time Contractor/Consultant submits to City its executed agreement, Contractor/Consultant must satisfy all insurance and bonding requirements required by this Appendix B and applicable by law, and provide the required written documentation to City evidencing such compliance. In the event that Contractor/Consultant does not comply with such submittal requirements within the time period established by the solicitation documents applicable to the agreement, City may, in addition to any other rights City may have under the solicitation documents applicable to the agreement or under applicable law, make a claim against any bid security provided by Contractor/Consultant.

2. Minimum Financial Security Requirements

All companies providing insurance required by this Appendix B must meet certain minimum financial security requirements. These requirements must conform to the ratings published by A.M. Best & Co. in the current Best's Key Rating Guide - Property-Casualty. The ratings for each company must be indicated on the documentation provided by Contractor/Consultant to City certifying that all insurance and bonding requirements set forth in this Appendix B and applicable to the agreement have been unconditionally satisfied.

For all agreements, regardless of size, companies providing insurance or bonds under the agreement must meet the following requirements:

- i) Best's rating not less than A-,
- ii) Best's Financial Size Category not less than Class VII, and

- iii) Companies must be authorized to conduct and transact insurance contracts by the Insurance Commissioner, State of Georgia.
- iv) All bid, performance and payment bonds must be underwritten by a U.S. Treasury Circular 570 listed company.

If the issuing company does not meet these minimum requirements, or for any other reason is or becomes unsatisfactory to City, City will notify Contractor/Consultant in writing. Contractor/Consultant must promptly obtain a new policy or bond issued by an insurer acceptable to City and submits to City evidence of its compliance with these conditions.

Contractor/Consultant's failure to comply with all insurance and bonding requirements set forth in this Appendix B and applicable to the agreement will not relieve Contractor/Consultant from any liability under the agreement. Contractor/Consultant's obligations to comply with all insurance and bonding requirements set forth in Appendix B and applicable to the agreement will not be construed to conflict with or limit Contractor/Consultant's/Consultant's indemnification obligations under the agreement.

3. Insurance Required for Duration of Contract

All insurance and bonds required by this Appendix B must be maintained during the entire term of the agreement, including any renewal or extension terms, and until all work has been completed to the satisfaction of City.

4. Notices of Cancellation & Renewal

Contractor/Consultant must, notify the City of Atlanta in writing at the address listed below by mail, hand-delivery or facsimile transmission, within 2 days of any notices received from any insurance carriers providing insurance coverage under this Agreement and Appendix B that concern the proposed cancellation, or termination of coverage.

Enterprise Risk Management  
68 Mitchell St. Suite 9100  
Atlanta, GA 30303  
Facsimile No. (404) 658-7450

Confirmation of any mailed notices must be evidenced by return receipts of registered or certified mail.

Contractor/Consultant shall provide the City with evidence of required insurance prior to the commencement of this agreement, and, thereafter, with a certificate evidencing renewals or changes to required policies of insurance at least fifteen (15) days prior to the expiration of previously provided certificates.

5. Agent Acting as Authorized Representative

Each and every agent acting as Authorized Representative on behalf of a company affording coverage under this contract shall warrant when signing the Accord Certificate of Insurance that specific authorization has been granted by the

Companies for the Agent to bind coverage as required and to execute the Acord Certificates of Insurance as evidence of such coverage. City of Atlanta coverage requirements may be broader than the original policies; these requirements have been conveyed to the Companies for these terms and conditions.

In addition, each and every agent shall warrant when signing the Acord Certificate of Insurance that the Agent is licensed to do business in the State of Georgia and that the Company or Companies are currently in good standing in the State of Georgia.

6. Certificate Holder

The **City of Atlanta** must be named as certificate holder. All notices must be mailed to the attention of **Enterprise Risk Management** at **68 Mitchell Street, Suite, 9100, Atlanta, Georgia 30303**.

7. Project Number & Name

The project number and name must be referenced in the description section of the insurance certificate.

8. Additional Insured Endorsements Form CG 20 26 07 04 or equivalent

The City must be covered as Additional Insured under all insurance (except worker's compensation and professional liability) required by this Appendix B and such insurance must be primary with respect to the Additional Insured. **Contractor/Consultant must submit to City an Additional Insured Endorsement evidencing City's rights as an Additional Insured for each policy of insurance under which it is required to be an additional insured pursuant to this Appendix B. Endorsement must not exclude the Additional Insured from Products - Completed Operations coverage. The City shall not have liability for any premiums charged for such coverage.**

9. Mandatory Sub-Contractor/Consultant Compliance

Contractor/Consultant must require and ensure that all subContractor/Consultants/subconsultants at all tiers to be sufficiently insured/bonded based on the scope of work performed under this agreement.

10. Self Insured Retentions, Deductibles or Similar Obligations

Any self insured retention, deductible or similar obligation will be the sole responsibility of the contractor.

A. Workers' Compensation and Employer's Liability Insurance

Contractor/Consultant must procure and maintain Workers' Compensation and Employer's Liability Insurance in the following limits to cover each employee who is or may be engaged in work under the agreement. :

Workers' Compensation. . . . . **Statutory**

Employer's Liability:

Bodily Injury by Accident/Disease	<b>\$1,000,000 each accident</b>
Bodily Injury by Accident/Disease	<b>\$1,000,000 each employee</b>
Bodily Injury by Accident/Disease	<b>\$1,000,000 policy limit</b>

B. Commercial General Liability Insurance

Contractor/Consultant must procure and maintain Commercial General Liability Insurance on form (CG 00 00 01 or equivalent) in an amount not less than **\$1,000,000 per occurrence subject to a \$2,000,000 aggregate**. The following indicated extensions of coverage must be provided:

- ☒ Contractual Liability
- ☒ Broad Form Property Damage
- ☒ Premises Operations
- ☒ Personal Injury
- ☒ Advertising Injury
- ☒ Independent Contractor/Consultants/SubContractor/Consultants
- ☒ Products – Completed Operations
- ☒ Explosion, Collapse and Underground (XCU) Liability
- ☒ Additional Insured Endorsement\* (primary& non-contributing in favor of the City of Atlanta)
- ☒ Waiver of Subrogation in favor of the City of Atlanta

C. Commercial Automobile Liability Insurance

Contractor/Consultant must procure and maintain Automobile Liability Insurance in an amount not less than **\$1,000,000** Bodily Injury and Property Damage combined single limit. The following indicated extensions of coverage must be provided:

- ☒ Owned, Non-owned & Hired Vehicles
- ☒ Waiver of Subrogation in favor of the City of Atlanta

If Contractor/Consultant does not own any automobiles in the corporate name, non-owned vehicle coverage will apply and must be endorsed on either Contractor/Consultant's personal automobile policy or the Commercial General Liability coverage required under this Appendix B.

D. Excess or Umbrella Liability Insurance

Contractor/Consultant shall procure and maintain a policy providing Excess or Umbrella Liability Insurance which is at least as broad as the underlying policy. This insurance, which shall be maintained throughout the life of the contract, shall be in an amount of not less than **\$3,000,000 per occurrence**.

- ☒ May be used to achieve minimum liability limits
- ☒ Coverage must be as broad as primary policy

E. Builders Risk / Installation Floater

Contractor/Consultant shall procure and maintain policy for Builders Risk/ Installation Floater with all risk coverage to cover damage or destruction to renovations, repairs or equipment being installed or otherwise being handled or stored by the Contractor, including off-site storage, transit and installation. The coverage must be in an amount not less than **\$5,000,000**. The following indicated extensions of coverage must be provided:

- ☒ All Risk Coverage
- ☒ Operational Testing Coverage included
- ☒ Loss Payee Endorsement

F. Pollution Liability

Contractor/Consultant must procure and maintain Pollution Liability Insurance in an amount not less than **\$1,000,000** each occurrence/aggregate. Completed operations coverage shall remain in effect for no less than three (3) years after final completion. This coverage can also be satisfied with an endorsement to the General Liability policy.

G. Performance Bond and Payment Bond

Contractor/Consultant shall furnish a Payment Bond and a Performance Bond to the City in an amount equal to **100 percent of the total contract value** and for the duration of the entire term.

The person executing the Bonds on behalf of the surety shall file with the Bonds a general power of attorney unlimited as to amount and type of bonds covered by such power of attorney, and certified by an official of said surety. **Surety Must Be a U.S. Treasury Circular 570 listed company.**



# Appendix C

## Local Bidder Preference Program



# CITY OF ATLANTA

Keisha Lance-Bottoms  
Mayor

SUITE 1790  
55 TRINITY AVENUE, SW  
ATLANTA, GA 30303  
(404) 330-6204 Fax: (404) 658-7705  
Internet Home Page: [www.atlantaga.gov](http://www.atlantaga.gov)

DEPARTMENT OF PROCUREMENT  
Susan M. Garrett  
Interim Chief Procurement Officer  
[smgarrett@atlantaga.gov](mailto:smgarrett@atlantaga.gov)

## LOCAL BIDDER PREFERENCE APPLICATION

### SECTION ONE

**Business Name/DBA:**

Address:

City:

State:

ZIP Code:

Telephone Number:

Fax Number:

Business Type (Please check one) : ☐Partnership ☐Corporation, GA ☐Sole Proprietorship ☐Other: \_\_\_\_\_

**Principal or Corporate Office Name:**

Address:

City:

State:

ZIP Code:

Telephone Number:

Fax Number:

**Owner One - Name and Title:**

Address:

City:

State:

ZIP Code:

Telephone Number:

Fax Number:

**Owner Two - Name and Title:**

Address:

City:

State:

ZIP Code:

Telephone Number:

Fax Number:

**Officers/Partners One - Name and Title:**

Address:

City:

State:

ZIP Code:

Telephone Number:

Fax Number:

**Officers/Partners Two - Name and Title:**

Address:

City:

State:

ZIP Code:

Telephone Number:

Fax Number:

## SECTION TWO

To be certified as a Local Bidder, a potential bidder must satisfy no less than two (2) of the following criteria listed below. Please select **TWO (2)** of the following criteria which you satisfy to apply for certification as a Local Bidder. Additional documentation must be submitted with this application to verify that you satisfy the selected criteria. Instructions for submitting documentation to satisfy each of the criteria are located on the next page of this application.

1. Verify that the Potential Bidder's principal place of business is located in the City of Atlanta or that the Potential Bidder has held a valid City of Atlanta business license for at least one (1) year prior to the date of application.
2. Verify that a majority of the full-time employees, chief officers, and managers of the Potential Bidder have regularly conducted work and business in the City of Atlanta for at least one (1) year prior to the date of application.
3. Verify that a majority of the employees based at the Potential Bidder's location(s) in the City of Atlanta have been residents of the City of Atlanta for at least one (1) year prior to the date of application.
4. Provide references or other means of verification acceptable to the Department of Procurement, that the services the Potential Bidder offers to the City of Atlanta have been provided by the Potential Bidder in the City of Atlanta for at least one (1) year prior to the date of application.

If the applicant is a Joint Venture or Mentor-Protégé team, each participant in the Joint Venture or Mentor-Protégé team must be approved independently as a Local Bidder in order for the Joint Venture or Mentor-Protégé team to receive the bid preference on potential local projects.

### **Additional Instructions for Completing this Section**

For each of the criteria you selected in Section II, the Department of Procurement requires that you submit the following supporting documentation with this application:

#### **Business License**

If you have a City of Atlanta business license, please provide a copy of Articles of Incorporation or Organization, or a copy of the Potential Bidder's most recent federal income tax return, or if the potential Bidder is a partnership, provide a copy of the Partnership Agreement.

#### **Employees**

Provide a list of all full time employees, chief officers, and managers at the Potential Bidder's locations. For those employees, chief officers, and managers who regularly conducted work and business in the City of Atlanta for at least one year prior to the date of application, please provide employee's name, business address, business phone number, a brief description of the work business performed in the City of Atlanta, and the number of years such work or business has been performed in the City of Atlanta.

Provide a list of all employees based at Bidder's Potential locations. For those employees who have been resident of the City of Atlanta for at least one year prior to the date of application, provide employee's name, address, phone number and number of years at residence.

#### **References**

Provide a notarized letter from at least three (3) customers of the Potential Bidder, which letters shall include the following information: (a) a description of services provided by the Potential Bidder to the customer that were performed at least one (1) year prior to the date of application; (b) the total dollar value of the services provided at least one (1) year prior to the date of application; and (c) a statement that the services the Potential Bidder offers to the City of Atlanta have been provided by the Potential Bidder in the City of Atlanta for at least one (1) year prior to the date of application.

### SECTION THREE

Certification: This information herein is required by section 2-1188.1 Code of Ordinances of the City of Atlanta, Georgia.

I (name)\_\_\_\_\_ being the (title)\_\_\_\_\_ of the business firm named, do hereby apply for local bidder certification. In accordance with local preference ordinance, city of Atlanta, Georgia: the undersigned certifies that he/she is the person duly authorized by the business herein named to file this application for local bidder certification, including the accompanying documentation and statements, and that same are true, correct and complete.

Signature of applicant: \_\_\_\_\_ Date: \_\_\_\_\_

### GENERAL INFORMATION FOR APPLICANTS

- a) Applicability: This local preference program shall apply to any City contract as described in Code Section 2-1188, excluding competitive sealed proposals under Code Section 2-1189, small purchases not exceeding \$20,000 under Code Section 2-1190, sole source procurement under Code Section 2-1191, emergency procurement under Code Section 2-1192, competitive selection procedures for professional and consultant services under Code Section 2-1193, and federally-funded projects (referred to herein as "Potential Local Projects").
- b) A Potential Bidder must submit a completed and signed written application to become a Local Bidder **before** it will be allowed to receive a bid preference on a Local Project.
- c) In order to be approved as a Local Bidder and receive a bid preference on a Potential Local Project, the application for approval as a Local Bidder and all supporting documents must be received by the Department of Procurement no later than thirty (30) calendar days prior to the date bids are received on such Potential Local Project.
- d) Term: The certification as a Local Bidder shall expire two (2) years from the date of the approval of the application. Following the expiration date, a business is no longer a Local Bidder. A Potential Bidder must submit a new application for certification as a Local Bidder to the Department of Procurement and establish that it continues to meet the requirements of section 2-1188.1 in order to continue receiving the bid preference on Potential Local Projects.
- e) Potential Bidders certified as Local Bidders shall be under a continuing duty to immediately inform the Department of Procurement in writing of any changes in the Potential Bidder's business, if as a result of such changes, the Potential Bidder no longer satisfies the requirements.

# Appendix D

## Miscellaneous Documents





City of  
ATLANTA

## COLLECTION SYSTEM CONTINGENCY AND EMERGENCY RESPONSE PLAN

Collection and Transmission System  
Remedial Action Program

September 16, 2002

Approved **October 23, 2008**

City of Atlanta  
Department of Watershed Management

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- B. Hansen Sewer Overflow Management Reports
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- E. Sewer Spill Estimation
- F. Technical Memorandum – SSO Sampling Plan
- G. Rules of the Georgia DNR/EPD, Chapter 391-3-6-.05,  
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- H. Examples of Written Bulletins and Signage for Sewer Overflow Events
- I. City of Atlanta Supervisors, Managers and Staff Telephone List
- J. SOP for Consent Decree Submittals to EPD and EPA
- K. Area-wide Sampling Program



## 1.0 INTRODUCTION

Pursuant to the First Amended Consent Decree, Section VIII Remedial Actions for the Collection and Transmission System, paragraph B.1 Collection System Contingency and Emergency Response Plan, the City of Atlanta “shall develop and implement a written Collection System Contingency and Emergency Response Plan (CSCERP) to adequately protect the health and welfare of persons in the event of any sewage overflows from the [City of Atlanta’s] wastewater collection and transmission systems”. The implementation of this plan will allow the City’s compliance with Section VIII. The Plan is designed to correspond with the Georgia Rules and Regulations for Water Quality Control, Chapter 391-3-6-.05. The user of this manual should be attentive to changes in the Georgia Rules.

## 2.0 PURPOSE OF THE EMERGENCY RESPONSE PLAN (ERP)

The purpose of the Collection System Contingency and Emergency Response Plan (“ERP”) is to assure prompt and appropriate response to every report of a possible sewage spill received by Department of Watershed Management (“the Department”) employees so that any adverse effects to public health, water quality or customer service because of a confirmed sewer overflow can be minimized. The ERP further includes provisions to ensure reports are made to the appropriate local, state and federal authorities. For the purposes of this ERP, “confirmed sewage spill” is also sometimes referred to as “sewer overflow”, “SO”, “overflow”, or “pumping station overflow”. The effective date of this plan (i.e., final approval by EPA/EPD) was May 14, 2000. Amendments are approved by EPA/EPD from time to time and incorporated into the plan. Accordingly, users should make sure they are using the most recently updated plan.

### 2.1 Objectives

The primary objectives of the ERP are (1) the protection of public health and the environment, (2) compliance with requirements governing the procedures for managing sewer overflows, and (3) minimization of the risk of enforcement actions against the City of Atlanta.

Additional objectives of the ERP are as follows:

- Protect wastewater treatment plant and collection system personnel;
- Protect the collection system, pumping stations, wastewater treatment facilities, and all appurtenances;
- Protect private and public property adjacent to the collection and treatment facilities;
- Achieve customer service goals.

The ERP shall not supersede other City of Atlanta (City) emergency operations plans or Standard Operating Procedures (SOPs) unless determined and directed otherwise by the appropriate authority.

## 2.2 Organization of Plan

The key elements of the ERP are addressed individually:

Section 3.0	Overflow Response Procedure
Section 4.0	Monitoring/Sampling of Surface Waters Affected by Major Sewer Spills
Section 5.0	Public Advisory Procedure
Section 6.0	Regulatory Agency Notification Procedure
Section 7.0	Media Notification Procedure
Section 8.0	Distribution and Maintenance of ERP
Section 9.0	Implementation Schedule

## 2.3 Definitions of Pertinent Terminology

Appendix A is a glossary of selected terms used in the ERP, and for definitions of other relevant terms not necessarily used in the ERP but provided for additional background.

## 2.4 Sewer Overflow and Pumping Station Overflow Investigation and Tracking

A database that electronically files and tracks the frequency and location of sewer overflows and pumping station overflows will be maintained in the Hansen System. The database will assist the Commissioner of the Department of Watershed Management or his/her designee in directing capital-type corrective measures and to prioritize maintenance activities where chronic problems have been historically encountered.

After an overflow event, an investigative approach will be taken to establish the following criteria:

- As per the First Amended Consent Decree Section VIII.B.1.a.viii, an investigative approach will be taken to determine the cause of a sewage overflow. Guidance provided in Maintenance Procedure 1.1, "Main Line Stoppage", Maintenance Procedure 1.2, "Service Lateral Stoppage", and Maintenance Procedure 2.2, "External Sewer Inspection", contained in the *Maintenance Management Plan*, is available to support the determination of cause(s) of the sewage overflow.
- As per Maintenance Procedure 1.9, "Right-of-Way and Easement Inspection", and Maintenance Procedure 3.7, "Manhole Inspection", from the *Maintenance Management Plan*, rights-of-way and manholes will be inspected to determine the extent of the problem.

These inspections will be conducted a minimum distance of one eighth (1/8) of a mile up sewer and down sewer from the site of the sewage overflow.

- Follow-up inspections will be performed at the site of a sewage overflow, bi-weekly for one month, in order to determine the effectiveness of the corrective actions. Data will be captured on the City's Department of Watershed Management, Bureau of Wastewater Treatment and Collection Work Return form/Work Order. If no additional evidence of overflows is found, these inspections will be terminated.
- After each sewage overflow, the Preventive Maintenance (PM) schedule for the affected sewer(s) for cleanings, inspections, etc., will be reconsidered in order to prevent similar future occurrences. The site of the sewage overflow will remain on an accelerated or more frequent PM schedule, if necessary, until it is reasonably determined that the site is no longer a risk for a future occurrence due to maintenance needs.
- Where similar conditions are known to exist elsewhere in the Wastewater Collection and Transmission System that may pose a considerable risk for an overflow, it will be brought to the attention of supervisors by Bureau of Wastewater Treatment and Collections staff and proactive actions will be taken to minimize the risk of future overflows from occurring. Until the work order and physical inspection databases are complete enough to allow electronic queries to help locate other sites in the Wastewater Collection and Transmission System where similar overflow events may occur, Bureau of Wastewater Treatment and Collections staff will be dependent on their individual knowledge of the work area.
- After the occurrence of a sewage overflow, notification of relevant parties will be conducted (if applicable) in order to prevent future similar occurrences. Examples of relevant parties would include employees and management of restaurants, manufacturers, construction sites, etc., if their actions contributed to an overflow. Notification would include information on City Ordinances applicable to the given parties and type of operation, what requirements must be met in order to comply with the given ordinance, and what measures should be taken by the personnel to eliminate future overflows.
- Rain data will be recorded in each sewer basin, overflow reports will be correlated with the rain data, the location of wet weather related sewage overflows will be determined, and initiation of inspections of sites of wet weather related overflows will occur under the Implementation Schedule presented in Section 9.0. The locations of all confirmed wet weather related sewage overflow locations in Sewer basins receiving rain events exceeding 0.25 inches over a twenty-four (24) period will be inspected. These inspections will occur for a period of at least four (4) months following the last reported overflow at that location.

Information in the Hansen System (example, Appendix B) should facilitate the periodic revision, as necessary, of the "Investigative Flowchart", included in Appendix B-1, to more accurately reflect actual sewer overflow experiences of the department and their respective resolutions. The flowchart can be used to support the investigative approaches described in this section.

## 3.0 OVERFLOW RESPONSE PROCEDURE

The Overflow Response Procedure presents a strategy for the Department to mobilize labor, materials, tools and equipment to correct or repair and mitigate any condition which may cause or contribute to: 1) an unpermitted discharge (i.e., discharge to surface waters); and, 2) other sewer overflows and pumping station overflows which are successfully contained and present no threat to jurisdictional waters of the United States (surface waters). The plan considers a wide range of potential system failures that could create a spill to surface waters and to structures and/or land surfaces.

### 3.1. Receipt of Information Regarding a Sewer Overflow or Pumping Station Overflow

A sewer overflow may be detected by Department employees or by others. The Department of Watershed Management Call Center answering telephone calls dialed to 404-954-6340, or other telephone numbers provided by the Department, is primarily responsible for receiving phone calls from customers requesting service and reporting possible sewage overflows from the wastewater collection system and transmission system (e.g., sewer pipes and pump stations) and for notifying the appropriate personnel in the Bureau of Wastewater Treatment and Collection Wastewater Collection Section and/or the Wastewater Collection System Pumping Station Section.

Generally, telephone calls from the public reporting possible sewage overflows and pumping station overflows are received by the Customer Call Center of the Department of Watershed Management. The telephone number is 404-954-6340. The Call Center takes calls 24 hours per day, every day of the year.

- 1) The Call Center shall obtain information offered by the caller and seek other relevant information regarding the overflow, including:
  - a. Time and date the call was received.
  - b. Specific location of possible sewer overflow.
  - c. Time possible overflow was noticed by the caller.
  - d. Caller's name and phone number.
  - e. Observations of the caller (e.g., odor, duration, back or front of property).
  - f. Whether overflow has reached water or is flowing towards a creek or river.
  - g. Whether the overflow has reached or is flowing towards a park, playground, schoolyard or other public access location.
  - h. Other relevant information that will enable the responding investigator and crews, if required, to quickly locate, assess and stop the overflow.

- 2) The Call Center enters the overflow information into the Hansen System using the Customer Complaint Module and notifies the Customer Response Team of the Bureau of Wastewater Treatment and Collections or Manager of the Collection/Pumping Station Section, as appropriate.

Call Center calls are handled as follows in descending order of priority, based on the degree of public access to the overflow location:

- Sewage in the Creek; Sewer Overflow or Pumping Station Overflow to Dry Land with immediate and direct public access, as defined in the Glossary (Appendix A) - This is the highest priority. The Call Center shall IMMEDIATELY DISPATCH this call to the Customer Response Team of the Bureau of Wastewater Treatment and Collections. If the Call Center is unable to contact the Customer Response Team for that area, he/she shall continue calling supervisors until a supervisor is reached, regardless of his/her area of responsibility.
  - Cave-in; Sewer Overflow or Pumping Station Overflow to Dry Land with no immediate and direct public access, as defined in the Glossary (Appendix A):
    - Order of Priority for Cave-ins:
      - 1) Sewer pipes damaged/suspected damage
      - 2) No reported damage
  - Utilities damaged by all construction activity
  - Locating utilities: When receiving such calls, confirm whether or not the call is for emergency-related locating of utilities.
  - Residential/commercial building service requests.
- 3) The Call Center provides notification of possible sewage overflows to the appropriate Customer Response Team who if needed, contacts the appropriate Maintenance Crew. Confirmed sewage overflows are immediately reported to the Spill Compliance Inspector.
  - 4) Sewage overflows detected by any personnel in the course of their normal duties shall be reported immediately to the Call Center by two-way radio or by telephoning 404-954-6340. The Call Center shall record the relevant overflow information and immediately notify the appropriate Customer Response Team or Pumping Station Section personnel.
  - 5) A Customer Response Team or Pumping Station personnel shall confirm any reported possible sewer spill or pumping station overflow. Until confirmed, the reported possible spill or overflow should be referred to as a "possible" spill or overflow, not as a "sewage overflow" or "unpermitted discharge".
  - 6) The Spill Compliance Inspector shall complete a Spillage to Creek Report form or Overflow to Dry Land form and the Sewer Maintenance and Construction Work Return Form/Work Order (See Figure 1a or Figure 1b respectively) within 24 hours of confirmation that the reported spill has reached a water of the United States or dry land, including structures. Applicable supervisory or management personnel will be responsible for reviewing these

completed forms. Table 1 summarizes the sewage overflow and pumping station overflow response tracking protocol.

- 7) Notification of pump station overflows are received by Pumping Station Section's personnel at the Bolton Road Pumping Station. The pumping station operator on duty shall immediately convey all information regarding failures and overflows to the appropriate Customer Response Team or Pumping Station Superintendent and initiate the investigation and correction. Alarms due to equipment failure or power outage are reported from some of the pumping stations to the closest WRC. These alarms are reported to the Pumping Station Section Supervisor and are investigated immediately.

**8) Note: Assignment of Information Documentation Responsibilities**

During each shift, the Spill Compliance Inspector and Pump Station Supervisors shall designate herself/himself or an Inspector as the individual responsible for collecting and recording all information required by the Hansen System. Should a Crew Chief recognize that neither individual is available to document a spill, the Crew Chief should report that fact to the Spill Compliance Manager. The Customer Response Team may ask the Crew Chief to collect the information until the Spill Compliance Inspector or designee arrives at the spill site.

## Figure 1a - Spillage to Creek Form

Figure 1b - Spillage to Dryland Form

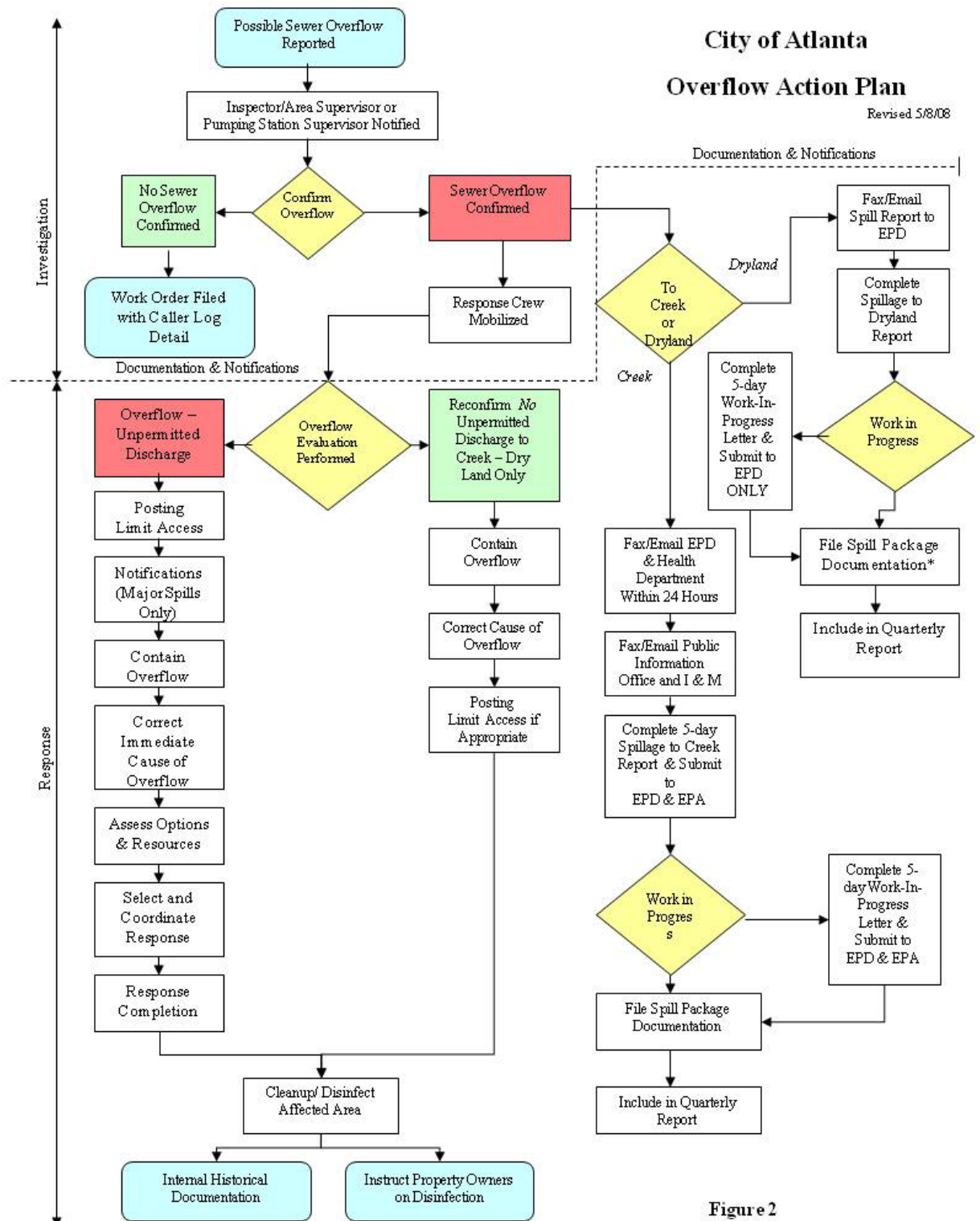


## Figure 1c- Work Return Form

Figure 1d - Work Order Form

**TABLE 1 - SEWER OVERFLOW AND PUMPING STATION OVERFLOW RESPONSE TRACKING PROTOCOL**

<b>Step</b>	<b>Event/Activity</b>
1 Pg. 4	Report of possible sewer overflow or pumping station overflow received by Call Center by telephone or 2-way radio (404-954-6340)
2 Pg. 4	Call Center completes a Service Request form in Hansen documenting the caller-provided information.
3 Pg. 5	a. Possible Sewer Overflow: Call Center contacts appropriate Customer Response Team in the Bureau of Wastewater Treatment and Collections who investigates the reported sewer overflow. b. Possible Pumping Station Overflow: Call Center contacts the Collection System Pumping Station Section and notifies the operator on duty; operator informs his/her supervisor and investigates the reported overflow.
4 Pg. 5	a. Possible Sewer Overflow: Spill Compliance Inspector or designee reports back to his/her Spill Compliance Manager providing an assessment of the significance of the overflow (e.g., volume/flow rate of spill, contained vs. discharge to surface water) and confirms overflow to the Call Center. Initial telephonic notification of regulatory agencies (i.e., EPD) is made by the Spill Compliance Inspector or designee for all spills to creeks. When applicable (spill $\geq$ 10,000 gallons or water quality violation), II & SM is notified for the purposes of initiating a Sampling Plan.  b. Possible Pumping Station Overflow: Pumping Station Operator reports back to the Superintendent of Pumping Stations the status of the overflow (i.e., confirmed or unconfirmed, contained vs. discharge to surface water). Initial telephonic notification of regulatory agencies (i.e., EPD) made by the Spill Compliance Inspector for all spills to creeks. When required (Major Spill), Industrial Inspection & Stream Monitoring (II & SM) is notified for the purposes of initiating a Sampling Plan.
5 Pg. 5	After containment, correction of overflow or cause of pumping station overflow and cleanup, Spill Compliance Inspector, Supervisor of Pumping Stations or City Designee completes Spillage to Creek or Spillage to Dry Land Report Form.
6 Pg. 28	Spill to Creek Report is faxed within 24 hours and filed with the EPA and GA EPD within five days of confirmation of the spill. Spill to Dryland Report is retained for compilation of Quarterly Report listing of all sewer overflows. Copies provided to each individual on the "cc" distribution list of the Spillage in Creek Report Form only.
7 Pg. 28	Dryland spills are required to be reported to EPD by fax/email within 24 hours. The 5-day written report to EPD is not required. Continue to provide copies of the Spillage to Dryland Report to the "cc" distribution list. Spillage to Dryland Report is to be filed with the spill package documentation and reported in the Quarterly Report.



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**Figure 2**  
June 2008

### **Notifications Regarding Pump Stations during Off-Shifts, Holidays and Weekends:**

A skeleton crew of two operators is maintained during off-shifts, holidays and weekends. The operators spend the majority of their time in the field checking pumping stations. Contacting a Pump Station Operator by land telephone lines may be difficult. To avoid delays in communicating pump station problems to Pumping Stations Section personnel during off shifts, holidays and weekends the following call out procedures shall be followed:

Should an emergency situation arise at a pumping station and the immediate contact of a Pumping Station Operator is not successful, the WRC plant crew member handling the emergency call shall first confirm that the reported pumping station is the responsibility of the City of Atlanta. The list shown in Appendix I identify the 16 pumping stations comprising the City's pumping station system and land line telephone numbers for those stations having such service.

Also, the list shown in APPENDIX I include supervisory personnel that are on-duty or on-call 24 hours a day/7 days a week. Upon confirmation, using the listing of home telephone and beeper numbers of all Pumping Station Section supervisory personnel provided the WRC plant crew shall call these numbers, starting with the first one, until they reach an authorized Pumping Station employee no matter what time of day or night that an emergency may arise.

## **3.2 Dispatch of Appropriate Crews to Site of Sewer Overflow**

The purpose of immediate response to a failure of any element within the wastewater collection and pumping station systems, which threatens to cause or causes a sewage overflow, is to isolate and correct the problem. Crews and equipment shall be made available to respond to any actual sewage overflow location. Also, additional maintenance personnel, materials and equipment shall be called in if extra resources are needed. Figure 2 summarizes the Sewer Overflow Action Plan.

### **1) Dispatching Crews**

- Call Center shall receive notification of possible sewage spills as outlined in Section 3.1 "Receipt of Information Regarding a Sewer Overflow or Pumping Station Overflow" and dispatch the request for service to the appropriate Bureau of Wastewater Treatment and Collections Customer Response Team or designee or to a Pumping Station Operator at the Bolton Road Pumping Station.
- Upon confirmation by the Customer Response Team or designee of a reported sewage overflow, if necessary, the Customer Response Team or Pumping Station Operator shall directly call for support additional crews and resources as needed.

### **2) Crew Instruction and Work Orders**

- Customer Response Team shall be dispatched by mobile radio or telephone, and shall take the necessary actions to correct the cause of the spill. If required, the Customer Response Team or the investigating Pumping Station Operator will contact additional

Sewer Collections crews regarding appropriate materials, supplies, and equipment to be deployed to resolve the problem.

- Call Center's Customer Service Representative or other personnel communicating with crews responding to a request for service shall ensure that the entire communication has been received and acknowledged by the responding crews. To avoid delay, all standard communications procedures shall be followed. All employees dispatched to the site of a sewage overflow shall proceed immediately to that site. Any delays or conflicts in assignments must be immediately reported to the appropriate Management Team or designee for resolution.
- Responding crews shall report their findings, including damage to private and public property, to their Management Team or designee as frequently as necessary to keep him/her abreast of the conditions found.
- Customer Response Team or designee shall assist, as necessary, at crew shift changes, in the transfer of all pertinent information to the next shift, including any details of the problems and observations described by customers.

### 3) Preliminary Assessment of Damage to Private Property

- The objective is resolution of the immediate cause of the overflow. The responding crew shall use discretion in providing assistance to a property owner/occupant who has sustained property damage. Be aware that the Department could face increased liability for any further damages caused to private property during such assistance. The responding crew should not enter private property for purposes of assessing damage unless directed otherwise by a Management Team or designee. Appropriate still photographs and video footage, if possible, should be taken of the impacted outdoor area of the sewer overflow in order to thoroughly document the nature and extent of damage. Copies of photographs, negatives or videotapes shall be maintained by the Spill Compliance Inspector for filing with a copy of the Spill to Creek Report or Spill to Dry Land Report, as appropriate.

### 4) Field Supervision and Inspection

- The Customer Response Team or designee assigned to a confirmed sewage overflow shall visit the site of the overflow to assure that provisions of this overflow response plan and other directives are met.
- The Spill Compliance Inspector or designee of the responding crew is responsible for completion of the Spill Report. If there is a need for a Work In Progress letter, the Spill Report is distributed to the Commissioner, Deputy Commissioner, Bureau of Wastewater Treatment and Collections Division Chief or Pumping Station Section Supervisor management staff and regulatory agencies, if appropriate. In the case of a pumping station overflow to a creek or dry land, the City designee shall be responsible for completing the Spill to Creek Report or the Spill to Dry Land Report, as appropriate, and informing the Commissioner, Deputy Commissioner, WRC management staff and regulatory agencies, as appropriate.

### 5) Coordination with Hazardous Material Response

- The investigating Pumping Station Operator or other responding crew shall contact his/her supervisor as soon as possible whenever a suspicious substance (e.g., oil sheen, foamy residue) is found on the ground surface, surface waters or ponded areas, or upon detection of a suspicious odor (e.g., gasoline) not common to the sewer system.
- Should the Customer Response Team decide it is necessary to alert the Atlanta Fire Department's hazardous material response team (HAZ-MAT) in consultation with the Bureau of Wastewater Treatment and Collections Division Chief and the Deputy Commissioner of the Department of Watershed Management, the responding crew shall await the arrival of the hazardous material response team to take over the scene. Remember that any vehicle engine, portable pump or open flame (e.g., cigarette lighter) can ignite an explosion or fire where flammable fluids or vapors are present. Keep a safe distance and observe caution until assistance arrives. The on-site staff shall also take measures to keep the general public away from the impacted area. Perimeter control of pedestrian and vehicular traffic shall be established using traffic barricades, barricade warning tape, or temporary barrier/safety fencing with signage, "Caution Do Not Enter" where appropriate.
- The Atlanta Fire Department's hazardous material response team shall be contacted by dialing 911.
- Upon arrival of the hazardous material response team, the responding crew shall take direction from the lead person with that team. Only when that authority determines it is safe and appropriate for the responding crew to proceed under the ERP with the sewer overflow containment, correction and clean-up activities, can they then proceed. Appendix C provides additional guidance.

### 3.3 Overflow Correction, Containment, and Cleanup

Spills may result from blocked sewers, pipe failures, power outages or mechanical malfunctions among other natural and manmade causes. The Bureau of Wastewater Treatment and Collections and Collection/Pump Station Section are on alert and shall respond immediately upon receipt of notification of a possible overflow.

This section describes specific actions to be performed by the responding crews during a sewer overflow or pumping station overflow.

The objectives of these actions are:

- To protect public health, environment and property from sewage spills and restore the surrounding area back to normal as soon as possible.
- To establish perimeters and control zones with appropriate traffic cones and barricades, vehicles or use of natural topography (e.g., hills).
- To promptly notify regulatory agency's Call Center of preliminary spill information and potential impacts.
- To contain the sewer overflow to the maximum extent possible including preventing the discharge of sewage into surface waters.

- To minimize the City of Atlanta's exposure to any regulatory agency penalties and fines.

Under most circumstances, the Department will handle response activities with its own work forces. The Bureau of Wastewater Treatment and Collections possesses the skills and experience to respond rapidly and in the most appropriate manner. An important issue with respect to an emergency response is to ensure that the temporary actions necessary to divert flows and repair the problem do not produce problems elsewhere in the system. For example, the repair of a force main requires the shutdown of the pump station and diversion of the flow at an upstream location. If the closure is not handled properly, a backup of sewage may create other spills.

Circumstances may arise when the Bureau of Wastewater Treatment and Collections requires the support of an outside construction contractor. This may occur when a deep and large diameter pipe requires an emergency repair in order to resolve the overflow and extensive shoring is necessary.

### 3.3.1 Responsibilities of Customer Response Team or Pumping Station Operator upon Arrival

It is the responsibility of the first Department personnel who arrive at the site of a sewage overflow or pumping station overflow to protect the health and safety of the public by mitigating the impact of the overflow to the highest extent possible. The City shall take responsible actions to protect public health and water quality where deficiencies in management, operation or maintenance, or inadequate main line capacity causes stoppages and backups into buildings, or overflows from private laterals. However, should the cause of the overflow not be the responsibility of the City, e.g., an overflowing private sanitary sewer, but there is imminent danger to public health, public or private property, or to the quality of waters of the United States, then prudent emergency action shall be taken until the responsible party assumes responsibility and provides appropriate action. Upon arrival at an overflow the Customer Response Team or responding Crew Chief shall do the following:

- Determine the cause of the overflow, e.g. sewer line blockage, sewer line break, pump station mechanical or electrical failure, or inadequate capacity, etc.
- Identify and request, if necessary, assistance or additional resources to correct the overflow or to assist in the determination of its cause.
- Determine if private property has been affected.
- Take immediate steps to contain, then stop the overflow, e.g. relieve pipeline blockage, manually operate pump station controls, repair pipe, etc. Extraordinary steps may be considered where overflows from private property threaten public health and safety (e.g., an overflow running off of private property into the public right-of-way). Extra care should be taken in securing the work site immediately adjacent to or around private property.
- Request additional personnel, materials, supplies or equipment that will expedite and minimize the impact of the overflow.
- Record information required by the Hansen System.

### 3.3.2 Response to Pump Station Failure



The Pumping Station Emergency Procedures SOP details the procedure to be followed by all pumping station personnel whenever a station is found not pumping, either due to a call or while the operator is on rounds. The same procedure is followed to repair a station to prevent a possible spill as well as to stop a spill.

The SOP contains the following steps:

- Switch to backup pump. If the backup will not operate:
- Check electrical power, replace fuses or reset breakers – if still no power:  
Call Georgia Power Critical Customer Number, 1-888-850-4551
- If power is available, but pump does not operate, check and clean floats, if necessary
- Operate pump by manual controls (Note: Caution shall be observed under manual operation so as not to cause an overflow or intensify an ongoing overflow.)
- Call for assistance, going down the call list in Appendix I.
- Contingency Plan – Outlined below
- The Bolton Road and Phillip Lee Pump Stations have two bar screens. Full flow to either facility will pass through one screen until the other can be returned to service.

- 2) For a pump or power failure, the following Contingency Plan provisions or resources are available:

<b>Pump Station</b>	<b>Pump Failure</b>	<b>Power Failure</b>
Phillip Lee	Use backup pump	On-site generator
Niskey Lake #2	Use backup pump Gas pump to manhole	Gas pump to manhole
<b>Pump Station</b>	<b>Pump Failure</b>	<b>Power Failure</b>
Niskey Lake #1	Use backup pump Gas pump to manhole	Gas pump to manhole
Cascade Road	Use back-up compressor or electrical submersible pump at adjacent upstream manhole.	Portable generator
Flint River-influent Flint River-effluent	Use backup pump Use backup pump Emergency storage	On-site generator On-site generator Emergency storage
S. River Industrial	Gas pump to manhole	Gas pump to manhole
Rebel Forest	Use backup pump	Portable generator
Woodward Way	Gas pump to manhole	Gas pump to manhole
Highlands	Use backup pump Gas pump to manhole	Gas pump to manhole
Hanover	Gas pump to manhole	Gas pump to manhole
Rivermeade	Use backup compressor	Portable generator
Paul Avenue	Use back-up compressor	Portable generator
Bolton Road	Use backup pump	On-site generator
Bell South	Use backup pump	Portable generator
Armand Road	Use backup pump	Portable generator
Northside Drive	Portable Pump	Portable generator

### 3) Initial Measures for Containment

First Responder(s) will initiate measures to contain the overflowing sewage and recover, where possible, sewage which has already spilled, minimizing the impact to public health and the environment.

- Determine the immediate destination of the overflow, e.g. storm drain, surface water, ground surfaces, structure, etc.
- Identify and request the necessary materials and equipment to contain or isolate the overflow, if not readily available.
- Take immediate steps to contain the overflow, e.g., block or bag storm drains, recover through vacuum truck, divert into downstream sanitary/combined sewer manhole, etc.

### 4) Additional Measures Under Potentially Prolonged Overflow Conditions

In the event of a prolonged sewer line blockage or collapse, or pumping station outage, a determination shall be made in a timely fashion to operate a portable pump-around operation to direct flows around the defective or damaged facility. Personnel shall be trained in proper portable pump capacity selection and the setup of temporary suction and discharge piping to assure safe and reliable emergency operation.

Other methods of bypassing shall be utilized when appropriate such as fluming and berming to contain flows while repairs are made.

- Appropriate measures shall be taken to determine the proper size and number of portable pumps required to effectively handle the sewage bypass pumping operation. Specific actions and resources are included in the Emergency Operations (PS-3.X) procedure in the Short Term Pump Station Operation Plan Standard Operating Procedures, current revision.
- Continuous or periodic monitoring of the bypass pumping operation shall be implemented as required.
- Any regulatory agency issues that arise as a result of a prolonged pumped bypass situation (e.g., need for redundancy of portable pumping) shall be addressed in conjunction with emergency repairs.

### 5) Cleanup

- Sewer overflow sites including contaminated soil, stream and riverbanks, and shorelines of other types of bodies of water, shall be thoroughly cleaned after an overflow. No readily identifiable residues (e.g., fecal matter, rags, papers, or plastics) shall remain.
- Where practical, the area shall be thoroughly flushed with the wash-down water being contained and properly disposed. Heavy flushing could make containment of washdown water impractical or not possible. Solids and other debris shall be flushed, swept, raked, picked-up and transported to proper disposal area.

- The overflow site shall be secured to prevent contact by the public until the site has been thoroughly cleaned. Posting, if required, shall be undertaken pursuant to Section 5.
- Where appropriate, the overflow site shall be disinfected and deodorized.
- Where sewage has resulted in ponding, the pond shall be pumped, if practical. Solids and other associated debris shall be flushed, raked, picked-up, and removed from the site and properly disposed. The contaminated soil shall be treated with lime broadcasted over the area at a rate equivalent to 100 pounds per 1,000 square feet.
- If a ponded area contains sewage, that cannot be pumped dry, it shall be treated with bleach or dry high-test hypochlorite (HTH). If sewage has entered a body of water that may contain fish or other aquatic life, bleach or other disinfectants shall not be applied. Appendix D contains additional guidance on the use of disinfectants.

#### 6) Spillage to Creek or Spillage to Dry Land Report

A Spillage to Creek Report form or Spillage to Dry Land Report form and Work Return/Work Order form (Figures 1a, 1b, 1c and 1d respectively) shall be completed by the responsible Spill Compliance Inspector or designee and checked by the Bureau of Wastewater Treatment and Collections Division Director or designee. The EPD shall be notified, as specified in Section 6.0, within 24-hours of confirmation of a spill. The hard copy report for a spill to surface waters is forwarded to EPD and EPA when repair work on the sewer is completed but no later than five days of confirmation of a spill. If a dryland spill requires more than 24-hours to correct, a written status report shall be forwarded by certified mail to EPD every five days until correction of the spill is completed. For spills to creek that require more than 24 hours to correct, a written status report shall be forwarded by certified mail to EPA and EPD every five days until correction of the spill is completed.

Information recorded for Sewage Overflows should include the following:

- Indication of whether there was an actual observation of sewage overflow or pumping station overflow running into surface waters, or whether there was only an indication (e.g. sewage residue on the ground surface leading to the surface water) that sewage had possibly flowed to surface waters but was not actually observed.
- Indication that the sewage overflow had not reached surface waters. Guidance in characterizing these overflows as dryland only includes:
  - a. Sewage spills to underground storm drains (with no public access) where a maintenance crew verifies, by inspection, that the entire volume is contained in an impoundment and where complete cleanup occurs, leaving no residue.
  - b. Spills where observation or on-site evidence clearly indicates all sewage was retained on land and did not reach surface water and where complete cleanup occurs leaving no residue.
  - c. Spills that enter or re-enter a combined sewer.

Pre-planned or emergency maintenance on a sewer or pumping station undertaken in conjunction with the use of a temporary earthen channel or trench shall only be effected provided public access is restricted and subsequent complete cleanup occurs. Note

however, such procedures will be treated as a dry land overflow including regulatory reporting.

- A determination of the start time of the sewer overflow using one of the following methods:
  - a. Date and time report of an overflow was received by the Call Center Customer Service representative.
  - b. Date and time of a visual observation by a Department of Watershed Management employee.
  - c. Pumping station flow charts and other recorded data.
- A determination of the stop time of the sewer overflow using the following method:
  - a. When the blockage is cleared or flow is controlled or contained
  - b. Visual observations.
- An estimation of the rate of sewer overflow or pumping station overflow in gallons per minute (GPM) by direct observation of the overflow.
- A determination of the volume or rate of the sewer overflow or pumping station overflow:
  - a. When the rate of sewer overflow or pumping station overflow is known multiply the duration by the rate of flow to determine the volume of the overflow.
  - b. When the rate of overflow is not known, investigate the surrounding area for evidence of ponding, obtain dimensions of ponding and calculate volume in gallons. Total volume divided by the appropriate time interval will provide a flow rate.
- Photographs of the event when possible.
- An assessment of any damage to public and private property. Personnel shall not enter private property for purposes of estimating damage to structures, floor and wall coverings, and personal property.

See Appendix E for additional guidance on estimating sewage overflow volumes and flow rates.

## 7) Customer Satisfaction

The Spill Compliance Inspector or designee confirming the reported sewage overflow shall make follow-up contact with the customer(s) reporting the incident, summarizing the actions taken to resolve the overflow, to clean up the area, and to post and barricade the area if necessary.

## 4.0 MONITORING/SAMPLING OF SURFACE WATERS AFFECTED BY SEWER SPILLS

### 4.1 General Procedures

The City will provide an Area-Wide Monitoring Program as specified in Appendix K and sample and monitor surface waters affected by Major sewer spills in accordance with State Rules. Once a spill is confirmed, personnel from the Bureau of Wastewater Treatment and Collections will respond to the location of the spill. These personnel will take the following steps, immediately:

- Initiate efforts to contain, then stop spill and determine volume of spill (i.e. total gallons).
- Determine if spill goes to a stream or receiving water.
- Notify sampling team, if appropriate.
- Post signs for restricting public access.

Any Bureau of Wastewater Treatment and Collections employee(s) involved in or in observance of a supposed Major Spill (as defined below), shall initiate a sampling request by contacting the Bureau of Watershed Protection, Division of Industrial Inspection & Stream Monitoring (II & SM) for sampling. Sampling requests shall be initiated by the Bureau of Wastewater Treatment and Collection Deputy Commissioner (or his/her designee) or the Wastewater Collection System Supervisor (or his/her designee) during normal business hours (Monday to Friday, 7a.m. to 7p.m.). The II & SM switchboard number is (404) 350-4909. Alternative, emergency contact numbers are shown in Appendix I. During after hours, weekends or holidays, the inspectors identified should be contacted by starting with the first name on the list and working down, as necessary, until the needed contact is made. Home telephone and cell numbers should only be called during actual emergency situations - see Appendix I. If a contact is not available, leave a message telling each person your name and that you are proceeding in contacting II & SM and with whom you plan to speak.

The Collection/Pumping Station Superintendent or Pumping Station Supervisor is responsible to see that II & SM is contacted in the case of any spill from a pumping station, where sampling is required. During normal business hours, the spill and sampling request shall be made by contacting the II & SM switchboard at (404) 546-1374. After hours, the call shall be made to the II & SM employees listed in Appendix I-3, in the order listed, until someone is reached and responds.

Additional sampling information and protocols are contained in Appendix F.

### 4.2 Major Spills

Pursuant to the Rules of the Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-6-.05, Water Quality Control - Emergency Actions (Appendix G), any discharge of raw sewage that is in excess of 10,000 gallons or results in water quality violations in the waters of the State, is defined as a "major" spill and requires that a monitoring program of the waters affected by such a spill be initiated (Appendix G). That

program shall be carried out for one year. II & SM is responsible for conducting the monitoring and sampling program.

**Step 1. Complete the Spillage to Creek Report**

A Spillage to Creek Report shall be completed by the Spill Compliance Inspector or designee contact and then be delivered via fax to II & SM, which will determine if the spill requires sampling and monitoring. Be sure the estimated gallons of the spill are stated along with the receiving water body and the time of the spill.

Inspection and Monitoring Division Contacts; are as shown in Appendix I.

**Step 2. Confirm Receipt of Spillage Reports**

After faxing the Spillage to Creek Report to the contact person in II & SM, confirm receipt of the fax via radio, telephone call [(404) 546-1374 or emergency contact shown in Appendix I or pager. If the contact is unavailable, leave a message asking them to contact you to confirm receipt of the Spillage to Creek Report.

**Step 3. Transmittal of Sampling Data Reports**

Upon the completion of sampling and analysis by II & SM, sampling data for sampled events shall be sent via fax by the Monitoring Supervisor or the Division Chief to the Spill Compliance Inspector or designee. The Monitoring Supervisor shall confirm receipt of the data via telephone. If the contact is unavailable, the monitoring supervisor shall leave a message asking the contact to contact him/her to confirm receipt of the sampling data report. Stream monitoring reports for major spills shall be submitted to EPD by the 15<sup>th</sup> of the next month after completing the geometric mean calculations for fecal coliform bacteria.

## **5.0 PUBLIC ADVISORY PROCEDURE**

This section describes the actions the Department shall take, in cooperation with the U.S. EPA, Georgia Environmental Protection Division and the Fulton and DeKalb County Health Departments, to protect the public and limit public access to areas potentially impacted by unpermitted discharges to surface water. Actions to limit public access to areas impacted by sewer overflows and pumping station overflows which do not reach surface water but affect ground surfaces, structures or other resources are also addressed. Public notices shall be submitted to EPD by the 15<sup>th</sup> of the next month following the date of publication.

### **5.1 POSTING AND SIGNAGE**

The Bureau of Wastewater Treatment and Collection has primary responsibility for determining whether signage is necessary for areas affected by sewer overflows and pumping station overflows to ground surfaces, structures or surface waters. The main factor in determining when and where to post signs is the degree of public access to any effects of the overflow that may remain at the site. The posting of signage would not necessarily prohibit use

or access to the area unless posted otherwise, but provide a temporary warning of potential public health risks due to a recent sewage contamination. The Bureau may elect to use such signs, for example, where heavy flushing made it impractical to recover all of the wash-down water commingled with sewage. In cases when posting of signs is not sufficient or not feasible, door hangers may be used instead of, or in addition to, signs. The Spill Response Team or designee in consultation and cooperation with the Fulton or DeKalb County Health Department, as appropriate, shall make this decision.

In accordance with the Rules and Regulations for Water Quality Control (Chapter 391-3-6.05), a spill to State waters and/or a major spill will be immediately posted as close as possible to where the spill occurred and where the spill entered State waters (if applicable) for a minimum of seven (7) days after the spill has ceased with the following information provided:

1. Date of spill to State waters or major spill
2. Name of Receiving Waters
3. Location and cause of spill to State waters or major spill
4. Estimated volume discharged and name of receiving waters if applicable
5. Corrective action taken to mitigate or reduce the adverse effects of the spill or major spill

Where spills have entered State waters, signage must be posted along the portions of the waterway affected by the incident. This signage must remain in place for a minimum of seven (7) days.

Table 2 outlines the posting decision process for City personnel. The Fulton or DeKalb County Health Department shall be consulted with during the posting decision process.

## 5.2 OTHER PUBLIC NOTIFICATION

Should it be determined that the posting of signs indicating that surface waters, ground surfaces or structures have been subject to a sewer overflow are not sufficient, the Deputy Commissioner, Bureau of Wastewater Treatment and Collection shall determine the need for further public notification, in consultation with the Public Information Officer. This additional notification will be accomplished through the use of pre-scripted notices made available to the print or electronic news media for immediate publication or airing, or by other measures (e.g., front door hangers). See Appendix H for notice forms and signage.

Circumstances under which further public notification may be considered include:

- When permanent repairs to resolve an overflow condition will take in excess of 24-48 hours and the reduction in the usage of water in homes and businesses would assist in managing the operation of the locally affected sewer or pumping station;
- When permanent repairs to resolve an overflow condition will take in excess of 24-48 hours and the citizenry need to be advised of repair schedules and possible traffic detours in the vicinity of the repairs and/or sewer or pumping station pump-around operations;

- When permanent repairs to resolve an overflow condition which took in excess of 24-48 hours are completed and the City wishes to recap the episode such as the circumstance(s) contributing to the cause of the overflow, measures taken to repair and cleanup the affected area, time required to effect repairs, total gallonage of the overflow, and any continuing monitoring of surface waters, if applicable; and,
- When posting of waterways and ground surfaces affected by overflows cannot be effectively accomplished to adequately protect public health and safety (e.g., receiving water is bordered by private property).

Table 2 - SEWER OVERFLOW (SO) POSTING DECISION PROCESS

### Step Event/Action

1.	Responding Bureau of Wastewater Treatment and Collection Customer Response Team or Crew Supervisor, or Wastewater Treatment and Collections, Collection/Pumping Station Section Supervisor or operator confirms reported SO.
2.	Bureau of Wastewater Treatment and Collection or Wastewater Treatment and Collection, Collection/Pumping Station Supervisor makes decision on intent to either post or not to post, or intent to use other public notification measures (e.g. front door hangers), depending on the degree of the public's accessibility to the area impacted by the spill. As a minimum, posting of major spills and spills to State waters will include the provisions of Section 5.1.
3.	Spill Compliance Inspector or designee faxes a notice to the appropriate county health on posting decision.
4.	The Deputy Commissioner of Watershed Management, Bureau of Wastewater Treatment and Collection, the Director of Wastewater Collections and the Public Information Officer are advised of the final posting decision, by the Spill Compliance Inspector or designee.
5.	If a Spill Compliance Inspector or designee's decision not to post or use other public notification measures is subsequently reversed by the county health department, the Spill Response Team or designee will be responsible for posting or using other public notification measures.
6.	Bureau of Wastewater Treatment and Collections or Wastewater Treatment and Collection, Collection/Pumping Station Supervisor consults with county health department before any signage or other public notification measures are removed. Locations of spills to waters must be posted for a minimum of seven days.
7.	The Spill Response Team or designee will note in the "comments" portion of the Work Return Form the basis for deciding to post or not post the receiving waters (e.g., limited public accessibility or area impacted by spill, adequate washdown and recovery of washdown water affected). Work Return Form is maintained with the corresponding spill file.



## 6.0 REGULATORY AGENCY NOTIFICATION PLAN

Agency notifications shall be performed in parallel with other City/Department internal notifications. The procedures for providing notification to the media of a sewer overflow are presented in Section 7.0 - Media Notification Procedure. Internal notification and mobilization of personnel are detailed in Section 3.0 - Overflow Response Procedure.

Using data supplied from the confirmation of reported possible overflows and subsequent updates from response personnel, the Spill Compliance Inspector or Pump Station Supervisor shall prepare initial and updated Spillage to Creek and Spillage to Dry Land Report forms. The Spill Compliance Inspector or Pump Station Supervisor shall notify EPD and the appropriate county health department via fax/email within 24 hours of all spillage to, creeks and other waters (Unpermitted Discharges). Spillage to Dry Land forms are faxed within 24 hours to EPD only.

Written notification to the EPA and EPD by a "hard copy" version of the Spillage to Creek Report (not a fax) shall be made within five (5) days from the time the Department confirms an Unpermitted Discharge. The Bureau of Wastewater Treatment and Collections Director or designee or the Manager of the Collection/Pumping Station Section or designee also shall submit written status reports to EPD (for dryland and creek) and EPA (for creek only) every five days until the overflow is corrected for overflows that require more than 24 hours to correct. Certified mail shall be used to transmit all written reports. When more than one (1) report is included in a single envelope, a manifest listing all reports shall be included in the envelope and placed in the file for each such spill (see Figure 3a).

Submissions of written "hard copy" reports within 5 days to EPA/EPD are not required for Spills to Dryland including dwelling spills. A Spillage to Dryland Report must be completed and maintained for development of the overflow list that is submitted with the Quarterly Report and for use in managing maintenance and improvement to the sewer system.

Figure 3a - Spill Reporting Manifest List

## 7.0 MEDIA NOTIFICATION PROCEDURES

When an overflow to surface water (Unpermitted Discharge) has been confirmed, the following actions shall be taken if it is necessary to notify the media:

- a. Spill Compliance Inspector or Pumping Station Operator who verifies an overflow shall contact the Commissioner of Watershed Management or his/her designee. The Deputy Commissioner or his/her designee shall contact the Public Information Officer (PIO) and provide him/her with pertinent information about the spill and direction for notification to the general public and media.
- b. The Public Information Office contacts in Appendix I summarizes the PIO contact names and numbers. The PIO shall be the "first-line" of response to the media for any confirmed overflow.
- c. After hours and weekend overflows are reported to the PIO at the number(s) listed for Public Information Office Contacts in Appendix I.
- d. Calls received by the Call Center from the media at any time are referred to the Public Information Officer.
- e. Only the Commissioner of Watershed Management or his/her designee is authorized to be interviewed by the media. All others are required to have written authorization from the Commissioner authorizing media interviews.

### Major Spills

The Public Information Officer shall publish a notice within 7 days in the legal organ of the county where the spill occurred for all major spills defined as follows:

1. Any discharge of raw sewage that (1) is in excess of 10,000 gallons or (2) results in water quality violations in the waters of the State.
2. The discharge of pollutants into the waters of the State by a City that exceeds the weekly average permitted effluent limit for biochemical oxygen demand (5-day) or total suspended solids by 50 percent or greater for any one day.

The Notice at a minimum shall include the following:

1. Date of the major spill
2. Location and cause of the major spill
3. Estimated volume discharged and name of receiving waters
4. Corrective action taken to mitigate or reduce the adverse effects of the major spill

### All Non-Major Spills

Where the City is responsible for a non- major spill to creek, a fax is sent to the Public Information Officer within 24 hours of becoming aware of the incident. The original document is filed. The report shall include at a minimum the following:

- Date of the spill.
- Location and cause of the spill.
- Estimated volume discharged and name of receiving water.

- Corrective action taken to mitigate or reduce the adverse effects of the spill.

## **8.0 DISTRIBUTION AND MAINTENANCE OF ERP**

The ERP reflects the procedures established for responding to reports of possible sewer overflows and confirmed overflows from the wastewater collection system and pumping station system so as to:

- Minimize the adverse effects of sewer overflows on public health, water quality and beneficial uses of the receiving waters.
- Minimize the sewer overflow volume which enters surface waters.
- Updates of the ERP shall be made to reflect all changes in City and regulatory policies and procedures as may be required to achieve its objectives.

### **8.1 Submittal and Availability of ERP**

Copies of the ERP and any amendments shall be distributed to the following offices, departments, bureaus, divisions, sections and functional positions:

- Office of the Mayor – Chief Operating Officer; Chief of Staff; Office of Marketing and Communications management staff; and,
- Department of Watershed Management – Commissioner; Deputy Commissioner; Public Information Officer; Bureau of Wastewater Treatment and Collection management and supervisory staff; Wastewater Treatment and Collection, Collection/Pumping Station Division, and Bureau of Management, Inspection and Monitoring Section management, supervisory and inspection staff.

All other Department of Wastewater Services, Bureau of Wastewater Treatment and Collections and Collection/Pumping Station Section staff who may become incidentally involved in responding to collection system and pumping station overflows shall be generally familiar with the contents of the ERP.

### **8.2 Review and Update of ERP**

The ERP shall be reviewed and amended as appropriate. The Department shall:

- Conduct annual reviews of the ERP and update it with the issuance of a revised or new NPDES permit.
- Conduct annual training on the use of the ERP with appropriate personnel.
- Review and update, as needed, the various contact person lists included in the ERP.

### 8.3 Review of Procedures and Preparedness

Training for preparedness and responsiveness associated with sewer and pumping station overflows will be provided as required to the Bureau of Wastewater Services, Public Information Officer, management and supervisory staff, and Collection/Pumping Station Section and Bureau of Management, Division of Inspection & Monitoring management and supervisory staff. The ERP will be used as the training guide. The session will focus on;

- Defining the goals and purpose of the ERP;
- Review of Overflow Response Procedure;
- Monitoring/Sampling of Surface Waters;
- Public Advisory Procedure;
- Regulatory Notification Procedure;
- Media Notification Procedures; and,
- ERP updates and revisions.

Representation of the following agencies and other City offices will be invited to participate in the training session:

- Office of the Mayor – Chief Operating Officer, Chief of Staff, Office of Marketing and Communications;
- Department of Watershed Management – Commissioner, Deputy Commissioner, Citizen Participation Office;
- United States EPA
- GA EPD
- Fulton and Dekalb Health Departments

Management will conduct periodic workshops with supervisory and other key City staff to review established response activities, and suggestions for new or revised procedures shall be held.

## 9.0 IMPLEMENTATION SCHEDULE

Following is the implementation schedule for the Emergency Response Plan:

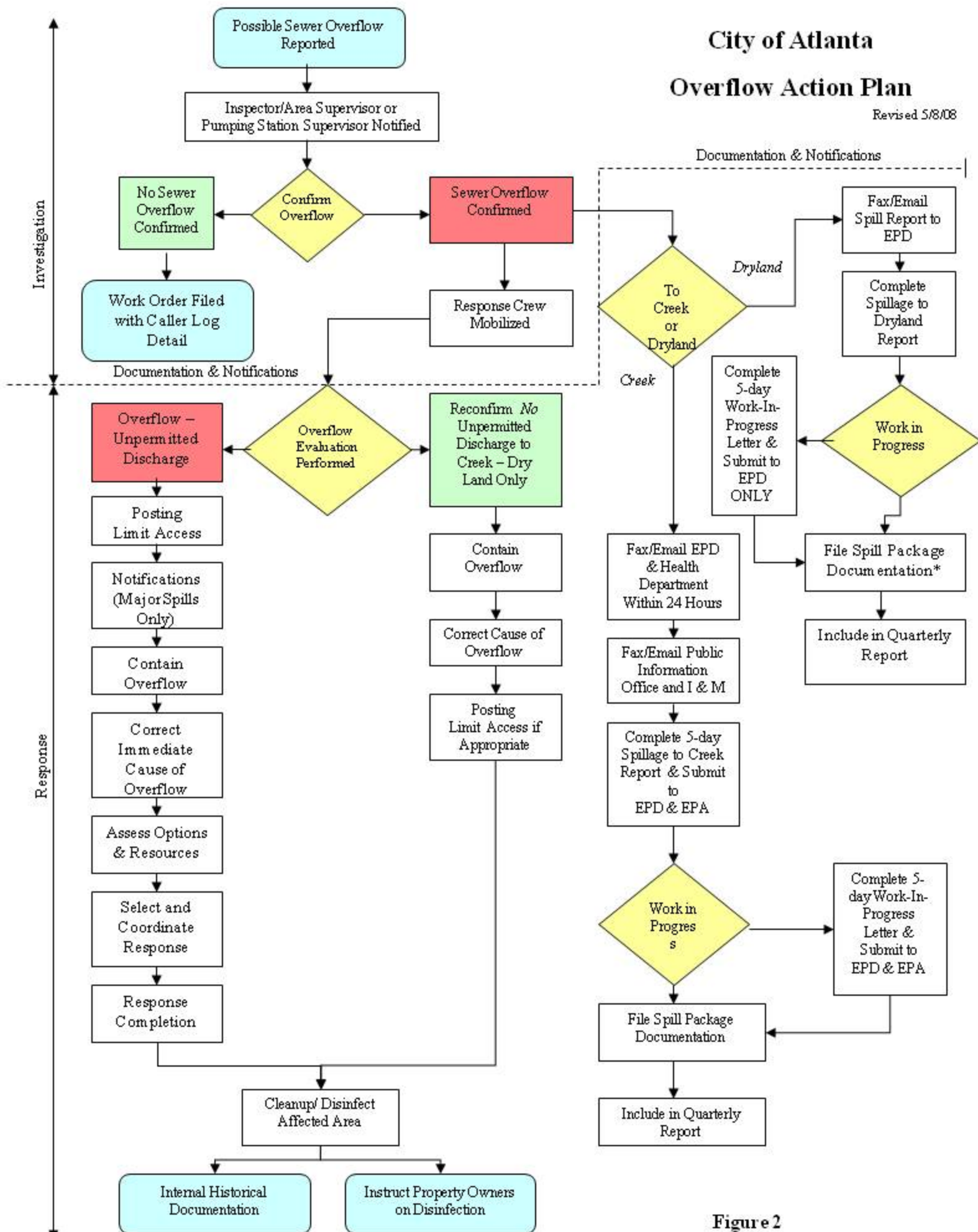
ERP SECTION	DESCRIPTION	IMPLEMENTATION DATE
<b>2.4</b>	<b>Training of other personnel to prevent future overflows</b>	Completed
<b>5.1</b>	<b>Posting and Signage</b>	
	Design Signs	Completed
	Print Signs	Completed
	Procure barrier materials	Completed
	Implement posting procedures	Completed
<b>5.2</b>	<b>Other Public Notification</b>	
	Implement public notification procedures	Completed
<b>6.0</b>	<b>Regulatory Agency Notification Plan</b>	Completed
<b>7.0</b>	<b>Media Notification Procedures</b>	Completed
<b>8.2</b>	<b>Review and Update of ERP</b>	
	Annual review of ERP	By each anniversary of the ERP's original EPA/EPD approval date, or other date as approved by EPA/EPD
	Annual training on use of ERP	Ongoing
<b>8.3</b>	<b>Review of Procedures and Preparedness</b>	
	Annual training in preparedness and responsiveness associated with sewer and P/S overflows	Ongoing
	Printed, weather-proof summary cards	Completed
	Periodic workshops to review response activities	Scheduled as required
<b>Appendix B-1</b>	<b>Sewer Overflow Management</b>	Completed

“Approval”: The originally submitted Emergency Response Plan was approved by EPA/EPD on May 14, 2000.

<b>Appendix B-2</b>	<b>Investigative Approach</b>	
	Right-of-way and manhole inspections procedures	Ongoing
	Follow-up inspections following completion of corrective actions	Ongoing
	Determine locations of other sites where similar overflows could occur	
	- using work orders/staff knowledge	Ongoing
	- using GIS	Ongoing
	- using Hansen MMS w/GIS	Ongoing
	- using hydraulic model	Ongoing
	Training to prevent future similar occurrences	Ongoing
	Determine extent of wet weather related overflows:	
	- correlate overflow reports with rain data (1)	Ongoing
	- determine location of wet weather related overflows	Ongoing
	- initiate inspection of wet weather related overflow locations	Ongoing
<b>Appendix E</b>	<b>Sewer Spill Estimation</b>	Completed

(1) Conditional upon availability of adequate rain data to establish correlations.

**City of Atlanta**  
**Overflow Action Plan**  
 Revised 5/8/08



**Figure 2**  
 June 2008



Sewer Services Field Inspection Form

JOB INFORMATION		
Date:	Service Request No./Work Order Number	
Site Arrival Time:	Address:	
Site Depart Time:	Contact Name:	
Inspector:	Contact Ph No.	Callback Requested? Yes      No
Quadrant:	Upstream Manhole ID	Downstream Manhole ID
PROBLEM CODE (circle)		
WMHD -DAMAGED MANHOLE	WSMD -DAMAGED SEWER MAIN	
WSTD - DAMAGED STORM SEWER	WODO -ODOR PROBLEM	
WOILS -OIL SPILL	WSPI - POSSIBLE SEWAGE SPILL	
WSMB -SEWER BACKUP	WSTB -STORM SEWER BACKUP	
WPLT - LOOSE OR MISSING PLATE	WCBB -DAMAGED CATCH BASIN	

Problem Resolved?	YES	NO
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If Yes, Circle One

RESOLUTION CODE	
WATER –WATER DEPT PROBLEM	WCCBI - CLEANED C/B OR INLET
OP – OWNERS RESPONSIBILITY	GASCO – GAS COMPANY PROBLEM
OUTCL – OUTSIDE CITY LIMITS	RDOT – STATE DOT RESPONSIBILITY
WCPL - WORK COMP - Detail below	RSTOP – REFER TO STREET OPERATIONS
CONTR – CONTRACTOR RESP.	NOPRO – NO PROBLEM FOUND

SPILL RESPONSE INFORMATION		
Spill Confirmed? YES                  NO	Confirmed Time:	Contained Time:
Creek Basin		
Rate of Flow (GPM):	Volume of Flow (Total Gal):	Raining?  YES                  NO
Spill to Dry Land?  YES                  NO	Spill to Creek?  YES                  NO	Vandalism?  YES                  NO
Responsible Party: (circle one) City                  Private                  Contractor	Appt. Time	
Pictures Taken? YES                  NO	Door Hanger?                  Y                  N Personally Informed Homeowner? Y                  N	
Work Order Required?	YES	NO

COMMENTS

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

If Yes, Circle All Required Actions for Job Completion

ACTIVITY CODES	
CCINSP - CREEK CROSSING INSPECTION	LANDSC - LANDSCAPE RESTORE
WC003 - INSTALL SEWER SERVICE LINE	WC004 - INSTALL SEWER TAP
WC008 - CONSTR TUNNEL	WC009 - INSTALL GABION BANK PROTECTION
WC010 - REPAIR STORM MAIN LINE	WC011 - INSTALL CLEANOUT
WC012 - REPAIR MANHOLE	WC016 - INSTALL BACKFLOW PREVENTER
WC020 - REPLACE MANHOLE LID	WC021 - INSTALL RETAINING WALL
WC022 - REPAIR GABION WALL	WC023 - CLEAN CATCH BASIN
WC032 - REPAIR PIER AT CREEK CROSSING	WC035 - REPLACE MANHOLE
WCCI - INSPECT CREEK CROSSING	WCCTV3 - SEWER MAIN SMOKE TESTING
WCROW - CLEAN RIGHT OF WAY	WCTV04 - CCTV LINE
WCTV09 - LOCATE MANHOLE	WCTV10 - LOCATE SERVICE CONNECT OR LINE
WCTV11 - LOCATE STORM LINE	WCTV13 - INSPECT SERVICE LINE
WCTV17 - INSPECT STORM DRAIN	WCTV22 - LOCATE SERVICE LINE
WCTV23 - INSPECT SEWER MAIN LINE	WFLOW - VISUAL OBS. OF M/L FLOW AT M/H
WFTV30 - FORMB TV INSP., M/L (LATERAL)	WINSP2 - INSP. FOLLOWUP 14 DAY
WINSP3 - INSP. FOLLOWUP 28 DAY	WM002 - REPAIR CATCH BASIN
WM005 - INSPECT CATCH BASIN	WM007 - CLEAN MANHOLE
WM013 – CLEAN SEWER LINE	WM015 - CONTAIN, CLEAN, DISINFECT SPILL
WM016 - CLEAN CB CONNECT	WM020 - CONSTRUCT MANHOLE
WM021 - REPAIR SEWER MAIN	WM022 - REPAIR SERVICE LATERAL
WM024 - REPLACE SERVICE LATERAL	WM026 - INSPECT ROW OR EASEMENT
WM029 - CLEAN CREEK CROSSING	WM030 - CLEAN SERVICE LATERAL
WMHI - INSPECT MANHOLE	WPLT - PLATE SET & REMOVAL

Crew Type Needed: (circle)

Catch Basin	Combo	Excavate
Mason	Pipe <del>—</del> Large	Rodding
Asphalt/Concrete	Bank Restoration	Lateral
Landscape	Jet Rod	Recon
Pipe - Small	CSO	

Permits Needed: (circle)

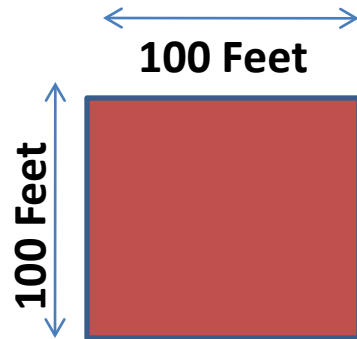
Traffic	ROW	Utility <del>Request</del>	Others
---------	-----	----------------------------	--------

Site Observations:

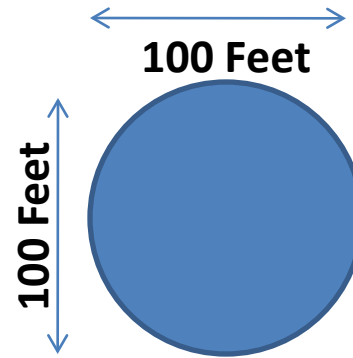
AREA SUPERVISOR ON DUTY \_\_\_\_\_

INSPECTOR \_\_\_\_\_

INSPECT DATE \_\_\_\_\_



$$V = 100' \times 100' \times 0.5 \times 7.48 \\ = 37,400 \text{ gal.}$$



$$V = 100' \times 100' \times 0.5 \times \\ 0.785^* \times 7.48 = 27,374 \text{ gal.}$$

\*Factor for estimating area of circle as a  
portion of the area of a square

# Appendix A

## GLOSSARY

Adverse Water Quality Impacts – Conditions which do not allow attainment of the designated use or uses of waters of the United States, which do not meet the conditions set forth in the Rules of Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-6m, Water Quality Control, Section 391-3-6.03, paragraphs (5) General Criteria for All Waters, and (6) Specific Criteria for Classified Water Usage, and/or do not protect the chemical, physical and biological integrity of the waters of the United States.

Best Management Practice – An approach which takes advantage of the best practical measures available to guard against a negative impact on the environment.

Chronic Overflows – Overflows that occur with a frequency as determined by the regulatory authority, at the same location; or, overflows that occur on a system-wide basis in a manner that suggests poor operation and maintenance.

Combined Sewer System – A wastewater collection system owned by a state, municipality or private owner, which is designed to convey sanitary wastewater and stormwater through a single-pipe system to a publicly-owned treatment facility.

Combined Sewer Overflow – A designed discharge from a combined sewer system at a point prior to the wastewater treatment facility.

Correction – Maintenance and repair activities restoring a sewer system so it can operate as designed.

Direct Access - Where the general public has direct physical access to an area impacted by a sewage overflow, via roads, highways, walkways, sidewalks or other improved paths located in public rights-of-way and easements.

Discharge – Any wastewater flow, treated or untreated, which reaches waters of the United States.

Immediate Access – Where the general public has instantaneous access to an area impacted by a sewage overflow, such as in school yards and public parks, without impediment by man made or natural barriers such as fencing or thick vegetation.

Inflow – Water other than wastewater that enters a sewer system from sources such as, but not limited to, roof leaders and gutters, cellar drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash water or drainage. Inflow does not include, and is distinguished from infiltration.

Infiltration – Water other than wastewater that enters a sewer from the ground through such means as defective pipes, pipe joints, connections or manholes. Infiltration does not include, and is distinguished from, inflow.

Municipality – A city, town, borough, county, parish, district, association or other public body created by or under State law and having jurisdiction over disposal of domestic wastewater, industrial waste or other wastes, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under Section 208 of the federal Clean Water Act. The term municipality may be interchangeably used with “public sector interest”.

Notification – Process of informing system personnel, regulatory entities and the general public of a sewer overflow incident.

Posting of Signs – Process of advising the public of potential health risks associate with sewer overflow at a particular site by erecting signs.

Public Waters – Body of water (surface water) such as an ocean, bay, river, lake, stream or creek where there is the potential of contact y a member of the public.

Reporting – Formal process of informing regulatory entities of sewer overflows and response activities through written documentation.

Sanitary Sewer System – A wastewater collection system owned by a State, municipality or private owner which is designed to convey municipal and industrial wastewaters with allowances for groundwater infiltration and unavoidable stormwater that are not admitted intentionally.

Spill – An act or omission by which hazardous substances in harmful quantities are spilled, leaked, pumped, poured, emitted, entered or dumped onto or into the waters or land of the state; also substances that, without removal or control, may drain, seep, runoff, or in some way enter into or onto the waters or land of the state.

Storm Sewer – A pipeline designed to carry only stormwater, surface runoff, street wash waters and drainage.

Surface Waters – All “Waters of the United States” as defined in 40 CFR 122.2 such as navigable waters, rivers, streams (including ephemeral streams), lakes playa lakes, natural ponds, bays, oceans, lagoons, estuaries, manmade canals, ditches, dry arroyos, mudflats, sandflats, wet meadows, wetlands, swamps, marshes, sloughs and water courses. [Note: SSOs to storm drains tributary to “Waters of the United States” (surface waters) shall be reported as discharges to surface waters.]

System Operator – The private sector or public sector (municipality) interest having the responsibility and public trust to properly operate and maintain a sanitary sewer system. The operator may not be the legal owner or named permittee of the system.

Unpermitted Discharge – The discharge of pollutants from a point source into waters of the United States or the State which is not authorized by an NPDES permit.

Watershed – a defined area where surface waters drain to a water body or a portion of a water body (e.g., a river segment). Watershed boundaries are based on hydrologic considerations.

# Appendix A

## GLOSSARY

Adverse Water Quality Impacts – Conditions which do not allow attainment of the designated use or uses of waters of the United States, which do not meet the conditions set forth in the Rules of Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-6m, Water Quality Control, Section 391-3-6.03, paragraphs (5) General Criteria for All Waters, and (6) Specific Criteria for Classified Water Usage, and/or do not protect the chemical, physical and biological integrity of the waters of the United States.

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Watershed – a defined area where surface waters drain to a water body or a portion of a water body (e.g., a river segment). Watershed boundaries are based on hydrologic considerations.

## APPENDIX B

### SAMPLE REPORTS AVAILABLE FROM THE HANSEN OVERFLOW MANAGEMENT SYSTEM



Hansen is used by the world's leading water and waste management contractors and municipal agencies.

Hansen is an industry-accepted management tool used for controlling the serviceability of potable water, effluent and stormwater assets. With a complete work order management, customer service, field inspection, inventory control, utility billing, activity-based costing, asset valuation and permit processing capability.

The wastewater component facilitates managing a complete network of sanitary, combined and force main sewers, including mainlines, manholes and services.

## APPENDIX B

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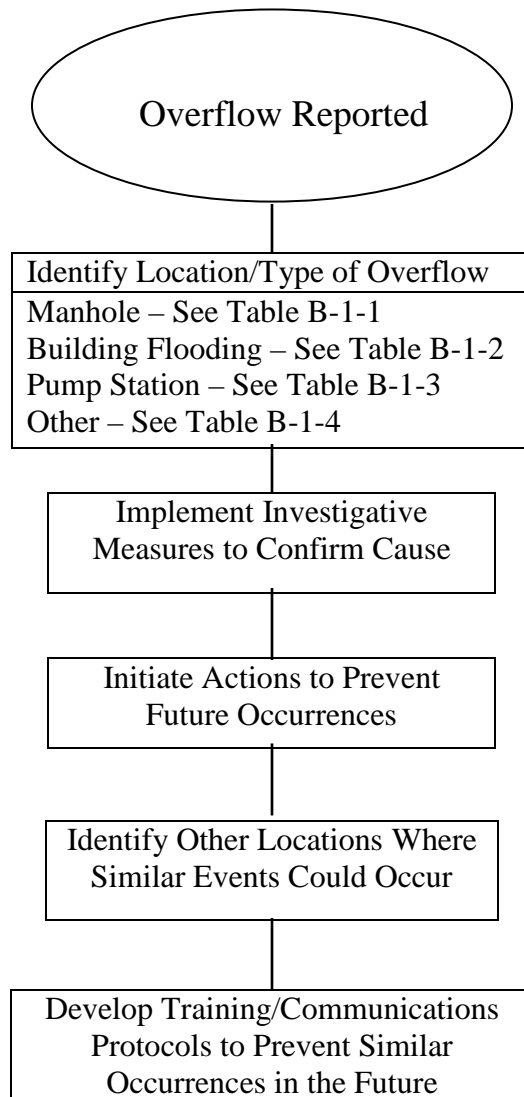
The wastewater component facilitates managing a complete network of sanitary, combined and force main sewers, including mainlines, manholes and services.

# APPENDIX B-1

## DIAGNOSTIC TOOLS

## Appendix B-1

Investigative Process to Determine SSO Causes, Corrective Actions and Preventive Measures.



# Investigative Chart to Determine SSO Causes, Corrective Actions and Preventive Measures

Table B-1-1

Location/Type of Overflow: **MANHOLE**

Cause	Diagnostic Tools	Actions to Prevent Future Occurrences
Hydraulic Capacity Limit (Dry Weather)	Hydraulic Modeling Engineering Evaluation Support Temporary Flow Monitoring	Clean more frequently until line is relieved; Temporarily escalate wastewater minimization practices through public education/notification practices; Report to engineering.
Rain-dependent Infil. (Pipe Defects)	Engineering Evaluation Support CCTV Inspection Smoke Testing Dyed Water Flood Testing	Clean more frequently prior to capital I/I rehabilitation; Report to Engineering
Inflow (X-connect, Manhole Cover)	Smoke Testing Dyed Water Flood Testing with CCTV Temporary Flow Monitoring Manhole Inspection Inspect Right-of-way/easement	Remove x-connect; Install manhole inflow protectors
Groundwater Infiltration	Smoke Testing Night Time Flow Isolation testing Piezometric Data	Clean more frequently prior to capital I/I rehabilitation
Debris Deposition	CCTV Inspection Manhole Inspection Line Lamping	Clean line; Monitor need for increased cleaning frequency
Partial/total Line Collapse	CCTV Inspection Line Lamping Ground-penetrating Radar	Make point repair

See Notes A and B



# Investigative Chart to Determine SSO Causes, Corrective Actions and Preventive Measures

Table B-1-1

Location/Type of Overflow: **MANHOLE** (Cont.)

Cause	Diagnostic Tools	Actions to Prevent Future Occurrences
Sag	CCTV Inspection Line Lamping	Make point repair
Flat/reverse Grade	Line Lamping Ground Survey	Clean more frequently until capital improvement made
Severely Offset Joints	CCTV Inspection Line Lamping	Make point repair
Grease	CCTV Inspection Manhole Inspection	Thoroughly clean the line; Escalate source control efforts
Roots	CCTV Inspection Line Lamping Manhole Inspection	Mechanically or chemically remove roots; Exercise source control
Protruding Tap (Collector Sewer)	CCTV Inspection	Remove protruding tap
Vandalism	CCTV Inspection Manhole Inspection Line Lamping	Bolt down manhole cover to keep foreign material out; Coordinate with police for increased patrolling of area
Adjacent Construction Activities	CCTV Inspection Temporary Flow Monitoring Line Lamping Construction Observation/inspection Insect Right-of-way/easement	Increase city monitoring of 3 <sup>rd</sup> party construction activities; Monitor flows
Downstream Pump Station Failure	Check Pump Station Status	See PUMP STATION/TRANSMISSION SYSTEM

See Notes A and B.

# Investigative Chart to Determine SSO Causes, Corrective Actions and Preventive Measures

Table B-1-2

Location/Type of Overflow: **BUILDING FLOODING**

<b>Cause</b>	<b>Diagnostic Tools</b>	<b>Actions to Prevent Future Occurrences</b>
Collapse, Sag	CCTV Inspection	Engage services of a plumber
Grease, Debris and Roots	CCTY Inspection	Engage services of a plumber of line cleaning service; consider replacement of service if a chronic problem; install additional clean-out(s) as necessary
Infiltration/inflow	CCTV Inspection Smoke Testing Dyed Water Flood testing Ground-penetrating Radar	Remove inflow sources, e.g., sump drains, roof leaders
Defective Service Connection at collector Sewer	CCTV Inspection	Proper reconnection by City
Collector Sewer Backup Into Service Lateral	See MANHOLE	(See MANHOLE, (City responsibility)

See Notes B and C.

# Investigative Chart to Determine SSO Causes, Corrective Actions and Preventive Measures

Table B-1-3

Location/Type of Overflow: **P.S./TRANS. SYSTEM**

<b>Cause</b>	<b>Diagnostic Tools</b>	<b>Actions to Prevent Future Occurrences</b>
Primary power failure	Engineering evaluation support Contact Georgia Power	Arrange "2 <sup>nd</sup> source" power from Georgia Power
Standby power failure	Engineering evaluation support Check pump station status	Make repair; periodic load bank testing; exercise equipment weekly; increase preventive maintenance (PM)
Pump/drive failure	Engineering evaluation support Check pump station status	Make repair; increase preventive maintenance; keep portable pumping available nearby; consider unit replacement or rehab
Force main failure	Engineering evaluation support Inspect right-of-way/easement	Make point repair; inspect interior main walls upstream & downstream of repair; consider replacement of line; assess need for corrosion control
Eqpt. controls/switch gear failure		Make repair; increase preventive maintenance
Hydraulic capacity limit	Engineering evaluation support Temporary flow monitoring	Perform pump test; check test curves against design criteria and actual flows; temporarily escalate wastewater minimization practices in tributary area in interim until capital improvements are made; supply potable pump to augment capacity
Vandalism	Check pump station status	Coordinate with police for increased patrolling of area; make less accessible with fencing; fortify vault and door security; alarm and enhance outdoor lighting

See Notes D and E.

# Investigative Chart to Determine SSO Causes, Corrective Actions and Preventive Measures

Table B-1-4

Location/Type of Overflow: **SUSPENDED & BURIED PIPELINES,  
SIPHONS, AIR/VAC RELEASES; VAULTS  
AND OTHER APPURTENANCES**

Cause	Diagnostic Tools	Actions to Prevent Future Occurrences
Pipeline Collapse & Severe Exfiltration	CCTV Inspection Smoke Testing Dyed Water Flood Testing Manhole Inspection Line Lamping Ground-penetrating Radar Inspect Right-of-way/Easement	Confirm point repair is tied to sound existing pipe material
Washout at Subaqueous Creek/river Crossing	Manhole Inspection Inspect Right-of-way/easement	Protect repaired line with rip rap, gabions, etc.; Stabilize any further bank/invert “down cutting” (erosion) by surface water
Adjacent Construction Activities	Construction Observation/inspection Inspect Right-of-way/easement	Increase city monitoring of 3 <sup>rd</sup> party construction activities
Vandalism	Inspect Right-of-way/easement	Coordinate with police for increased patrolling of area; Make less accessible with fencing & other measures
Air/vac Release “Blowoff”	Inspect Right-of-way/easement	Direct the blowoff to nearest downstream sewer; increase air/vac valve maint.

See Notes F and G.

## Investigative Process to Determine SSO Causes, Corrective Actions and Preventive Measures

### Notes for Table B-1

#### Notes:

- Note A: Utilize the Work Order Tracking Tool and GIS to produce density graphs of locations of multiple sanitary sewer overflows. This tool can sort by cause or by number and will produce an indication of sites of increased risk of overflow.
- Note B: Watershed Management staff shall be adequately trained in methods to rapidly restore service in order to avoid the overflow or minimize its duration. Staff shall also be trained to thoroughly investigate conditions downstream of an obvious stoppage (e.g., grease) to assess how those conditions may have contributed. Such contributing factors shall be discussed with a supervisor and appropriate action taken to correct them in order to avoid or minimize the incidence of future overflows.
- Note C: With regard to collector sewer backups into service laterals, until the work order and physical inspection *forms in Hansen* are complete enough to allow convenient electronic queries to help screen for sites of increased overflow risk, Sewer Services staff will be dependent on the individual knowledge of their work area. Where conditions favorable to contributing to service lateral backups are known to exist, they shall be brought to the attention of their supervisors and a proactive course of action developed to avoid or minimize the incidence of future overflows.
- Note D: Each of the 16 pumping stations should be visited regularly by Bureau of Wastewater Treatment & Collection, Collection/Pumping Station personnel as specified by their supervisors to assure that the facility is in proper working order and that any developing problems are identified timely.
- “Lead” and “lag” position pumps should be switched periodically to allow even wear of pumps and drives; valve operators should be exercised; and check valves checked for proper operation. Periodically, loss of primary power should be simulated so automatic engagement of the standby power source, if applicable, can be observed. Identification of unusual pump noises, vibration, leaking seals, instrumentation and control problems, or other faulty conditions shall be reported immediately to the supervisor.
- Note E: Collection/Pumping Station Section operators shall be properly trained in the operations of the various types of pumping equipment. They shall be trained to identify potentially problematic conditions and troubleshoot common problems. They shall be instructed in performing routine preventive maintenance such as topping lubricating fluids, checking belt tensioning, and tightening mounting and fastening hardware to manufacturers’ recommendations.

The operators shall be instructed to take precautions when testing equipment so as not to cause overflows in the inlet sewer to the pump station as the result of voluntary interruption of service. Similar precautions are necessary when planned maintenance activities will require pump shutdown.

Other procedures described by manufactures' O & M manuals should be followed.

Note F: Bureau of Wastewater Treatment & Collection staff shall periodically inspect all suspended pipe and subaqueous pipe crossings to identify any threats to the integrity of those lines. During and after intense rainfall, the subaqueous crossings and those lines installed longitudinally in earthen creek and river banks should be inspected for possible erosion and undermining in the pipe zone.

Note G: Bureau of Wastewater Treatment & Collection staff shall be adequately trained in methods to rapidly restore service in order to avoid or minimize duration of an overflow. Identification of bank and invert erosion around pipes in or near watercourses shall be immediately reported to a supervisor.

APPENDIX C

HAZMAT GUIDANCE

## **Appendix C**

### **Coordination of Bureau of Wastewater Treatment & Collection and Pumping Station Personnel Responding to Sewer Overflows with Hazardous Materials Implications**

It is conceivable that in the investigation of a reported sewer overflow, Watershed Management personnel responding to the overflow may encounter hazardous materials. For example, a collapsed sewer line could cause fluids, like gasoline, to be released to the soil from defective fuel storage tanks from an adjacent service station, to commingle with the non-contained overflowing sewage. Special handling of this situation would be required in contrast to a common sewer overflow. Cleaning up a potentially explosive overflow without proper fire/explosion suppression procedures could be catastrophic.

Under such circumstances the following steps shall be taken:

1. Upon arrival at the site of an alleged sewer overflow, the Inspector/Area Supervisor or responding crew should immediately assess the area for unusual odors, liquids or solids not common to a sanitary sewer; in and around the immediate area of overflow impact as he/she goes about his/her overflow investigation.
2. Should unusual odors or substances be observed, he/she should immediately contact his/her supervisor. The Department's Safety Officer shall be contacted by the Inspector/Area Supervisor. He/she should also be in contact with the individual who dispatched him/her to the site to confirm whether or not the individual who originally reported the possible sewer overflow indicated any unusual odors or other observations.
3. The Section Supervisor or Safety Officer immediately responds and visits the overflow area.
4. After his/her investigation, he/she decides on whether or not to call in the Atlanta Fire Department's Hazardous Materials Response Team ("Haz Mat").
5. If the decision is to call in Haz Mat, the Watershed Management Department personnel must "stand down" (withhold any further response actions and retreat to a safe position) as they await Haz Mat to take over the scene and provide further direction.
6. Only after Haz Mat has responded to the emergency condition and returns control of the scene back to Department personnel, can their overflow response continue. That response may now have a special cleanup component to properly handle any contamination residues besides those related to normal sewage. This may require the involvement of a contamination remediation contractor.



## APPENDIX D

### RESPONSIBLE USAGE OF DISINFECTANTS IN SEWER OVERFLOW CLEANUPS

## Appendix D

### Responsible Usage of Disinfectants in Sewer Overflow Cleanups

Specific directions for disinfecting area impacted by overflows and for other sanitizing procedures, as appropriate, should be addressed in a Sewer Overflow Response Plan (SORP). In general, provisions may be set forth directing:

- Application of absorbent material;
- Proper excavation and disposal of affected soil and used absorbent;
- Flushing of the overflow site with clean (potable) water;
- Application, containment and recovery of any chlorinated washdown water; and,
- Return of all washdown water to the sewer.

When the use of a disinfectant is necessary, for instance with a ponded area of sewage cannot be readily returned to a sanitary sewer, or pumped dry due to difficult access to a vacuum truck, or the volume is prohibitively large, it may be treated with bleach or high-test hypochlorite (HTH). A dosing of 10 to 12 ounces of HTH per 100 square feet of pond surface may be appropriate for relatively shallow ponds (several inches deep). Deeper ponds may require significantly higher dosages and the Inspection and Monitoring Section chemist, the Fulton or DeKalb County Health Department, or the GA EPD should be contacted. However, if sewage has discharged into a body of water, under no circumstance should bleach or HTH be applied.

#### STEPS IN CALCULATING HTH DOSAGE:

Step 1: Measure the length and width in feet of a square or rectangular-shaped pond of sewage using a tape measure or measuring wheel. (Note: Use the method outlined in Appendix E – Sewer Spill Estimation, to estimate the approximate area of a circular shaped spill)

Step 2: Multiply the length times the width of the spill to calculate the surface area in square feet.

Step 3: Divide the surface area of the ponded sewage in square feet by 100 sq. ft. and multiply by 12 ounces (0.75 pounds) HTH to calculate the total dosage in pounds.

**APPENDIX E**

**SEWER SPILL ESTIMATION**

## Appendix E

### Sewer Spill Estimation

**Example #1:** To calculate the estimated amount of gallons in a ponded sewer spill, you must determine the volume of the spill. If it is a rectangular contained area:

$$\text{Volume} = \text{Length (L)} \times \text{Width (W)} \times \text{Depth (D)} \times 7.48 \text{ gallons/cubic foot} = \text{Gallons}$$

Example #1 Calculation: A rectangular spill is 100 ft. x 100 ft. x 0.5 ft. x 7.48 = 37,400 gallons

**Example #2:** If the spill has been running into a storm drain, you must estimate the gallons by the amount of time of the overflow times the number of service connections on the receiving line (assume 240 gallons per household per Day)

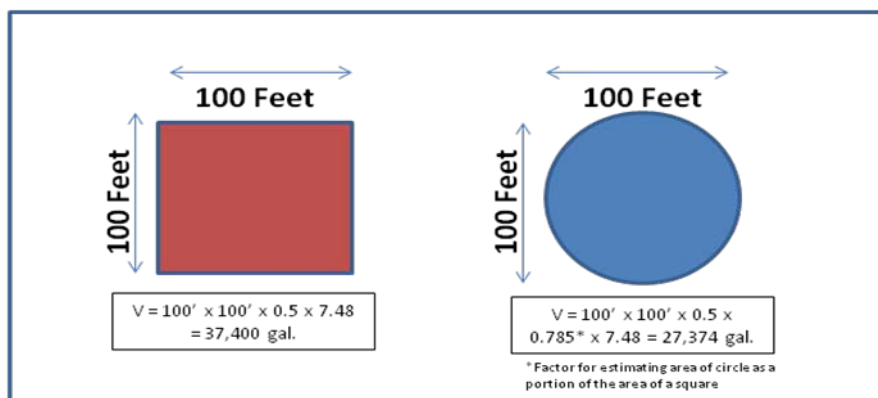
If you have a line with 6 house on it, and it has been overflowing for 24 hours (1 Day):

$$\text{Example \#2 Calculation: } 6 \text{ houses} \times 240 \text{ gallons/house} = 1,440 \text{ gallons}$$

**Example #3:** If the overflow is less than 24 hours in duration, then the calculation must prorate the daily sewage generation rate. If you have 60 house on a line that has been overflowing for 1 hour –

$$\text{Example \#3 Calculation: } 60 \text{ houses} \times 240 \text{ gallons/day/house} \times 1 \text{ hour} \times 1\text{day}/24 \text{ hours} = \underline{600 \text{ gallons}}$$

See illustration below for estimating the volume of a rectangular and circular ponded area.



## SPILL REPORTING MANIFEST LIST

NO	DATE	SERVICE REQUEST #	STREET ADDRESS	CERTIFIED MAIL RECEIPT #	
				EPA	EPD
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

**Note:** Insert a copy of this list in the certified mail envelope & place a copy in the file for each spill listed

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

City of Atlanta  
Department of Public Works  
Wastewater Services  
Spillage to Creek Report Form

YEAR: 2006  
SERVICE REQUEST NO: 356098  
NAME OF PERSON NOTIFIED AT GEMA FOR MAJOR SPILLS ONLY: Nadine Dower / 11/6/06 3:53 PM / SEQ# 1234567891011  
PREPARED BY: WILLIE SERCHION / GISELLE MELVILLE  
11/03/2006

LOCATION: a. 1160 PEACHTREE BATTLE AV. NW b. Sandy Creek  
(Affected Stream)

SOURCE OF ORIGINAL REPORT:

10/2/2006	11:00 AM	FLETCHER ANN GLASS	ATLANTA, GA	N/A
(Date)	(Time)	(Name)	(Address)	(Phone)

ACTION TAKEN: (give time,dates, estimated flow and Service Request #)

A crew responded to service request (#356098) of possible sewage spill. The crew arrived at the site at 11:00 AM on 10/02/06 and confirmed a spill to creek at an estimated rate of 100 GPM. The crew used hydraulic pressure cleaner to contain the spill at 1:50 PM. The cause of the spill was debris in the main line.

SAMPLE

	Initials
Water of State Posted (Y/N):	Yes
Water Quality Sampling Started (Y/N):	Yes
Legal Notice Process Initiated, for Major Spills Only (Y/N):	Yes

REPAIR COMPLETED:

ESTIMATE OF SPILLAGE (gallons): 1,700

REMARKS: (Steps taken to prevent reoccurrence. Placed on periodic inspection schedule. Need for upgrading, etc.)

SECOND CORRECTION/UPDATE FORTHE SPILL THAT OCCURRED ON 10/02/06. The correct address should be 1160 Peachtree Battle Avenue, N.W. instead of 1167 Peachtree Battle Avenue, N.W. Also in the action taken section the crew also cleaned and disinfected the area.

CC: Deputy Commissioner  
I & M Division  
Public Health Departments (Fulton County or Dekalb County)

Director of Wastewater Services  
EPD

Law Department  
EPA  
COA File(s)

PW Commissioners' Office  
PW Public Relations Officer

City of Atlanta  
Department of Public Works  
Wastewater Services  
Spillage to Dryland Report Form

YEAR: 2006

PREPARED BY: MICHAEL WILLIAMS

/ JAMES MITCHELL

9/2/06

SERVICE REQUEST NO: 350751

LOCATION: 871 HOBSON ST. SW

SOURCE OF ORIGINAL REPORT:

9/1/2006

(Date)

10:29 AM

(Time)

MS. CONNELIES BROOKS

(Name)

ATLANTA, GA

(Address)

(404) 293-0564 x

(Phone)

ACTION TAKEN: (give time,dates, estimated flow and Service Request #)

*A crew responded to service request (# 350751) of possible sewage spill. The crew arrived at the site at 11:35 AM on 9/1/06 and confirmed a spill to dry land at an estimated total of 20 gallons. This is not a city problem.*

REPAIR COMPLETED: 9/1/2006 11:55AM

ESTIMATE OF SPILLAGE (gallons): 20

REMARKS: (Steps taken to prevent reoccurrence, placed on periodic inspection schedule, for upgrading, etc.)

*Test remarks for report*

CC: Deputy Commissioner  
I & M Division  
Public Health Departments (Fulton County or Dekalb County)

Director of Wastewater Services  
PW Public Relations Officer

Law Department  
COA File(s)  
EPD Permitting, Compliance and  
Enforcement Program

PW Commissioners' Office

## Appendix F - Sanitary Sewer Overflow (SSO) Sampling Plan

PREPARED FOR: Department of Watershed Management, Sewer Operations

REVISED BY: Richard P. Daniel, PE

DATE: May 29, 2007 [original, 5/26/99; rev. 1, 9/13/02; rev.2, 4/13/04, 5/9/06 (rev.3)]

This technical memorandum describes a plan for responding to major spills in conformance with Rules and Regulations for Water Quality Control, Chapter 391-3-6 ("the Rules"). Specifically, this memorandum describes the sampling activities to supplement the tasks prescribed in the City's "Collection System Contingency and Emergency Response Plan" (ERP).

The sampling program described in this memorandum is primarily focused on determining the water quality impact SSO events have upon *surface* waters. Thus, for the purposes of this sampling program, "receiving water bodies" will be limited to the perennial flowing streams within the City and its environs. Furthermore, as discharges from the City's combined storm water and sanitary sewer system are regulated by separate NPDES permits, SSO's entering any portion of combined system will not be considered to have entered surface waters, and therefore will not be sampled.

In addition to describing the procedures to access any water quality impacts to receiving waters from an SSO, this Appendix provides a means of reporting and documenting the following information relating to an SSO event:

- Time and Date of the SSO;
- Location of the SSO;
- Corrective actions taken to mitigate or reduce the adverse effects of the overflow;
- Estimated duration of overflow;
- Location and name of the receiving water body;
- Field procedures for collecting samples of the receiving waters;
- Analytical methods to be performed on sampling of the receiving waters;
- Water quality impact, if any, to receiving waters: and
- Repairs, if any, to the collection and transmission system to prevent a reoccurrence of the SSO.

Additionally, Title 40 of the Code of Federal Regulations, Part 136: *Guidelines for Establishing Test Procedures for the Analysis of Pollutants* (40 CFR 136) was utilized to determine sample collection, preservation techniques, and analyses.



## **Response to and Assessment of an SSO Event**

The attached Figure 1 is a flow chart of the necessary activities to respond to and assess an SSO event with regard to meeting the “major spill” classification. The following paragraphs provide additional detail for these activities.

### **SSO Event Notification**

Section 3 of the ERP describes the procedures for notifying City personnel of a suspected SSO. In addition to the personnel identified to be immediately notified upon report of a suspected SSO, those personnel designated as the SSO Sampling Team on duty will also be notified to stand by pending confirmation of suspected overflow.

### **Confirmation of Sanitary Sewer Overflow**

Upon notification of a suspected SSO, field personnel will confirm whether an overflow has occurred. If these personnel determine that no overflow has occurred, the Sampling Team will be notified to stand down. If an overflow is confirmed to have occurred, but to have entered a combined sewer system, then the Sampling Team will be notified to stand down.

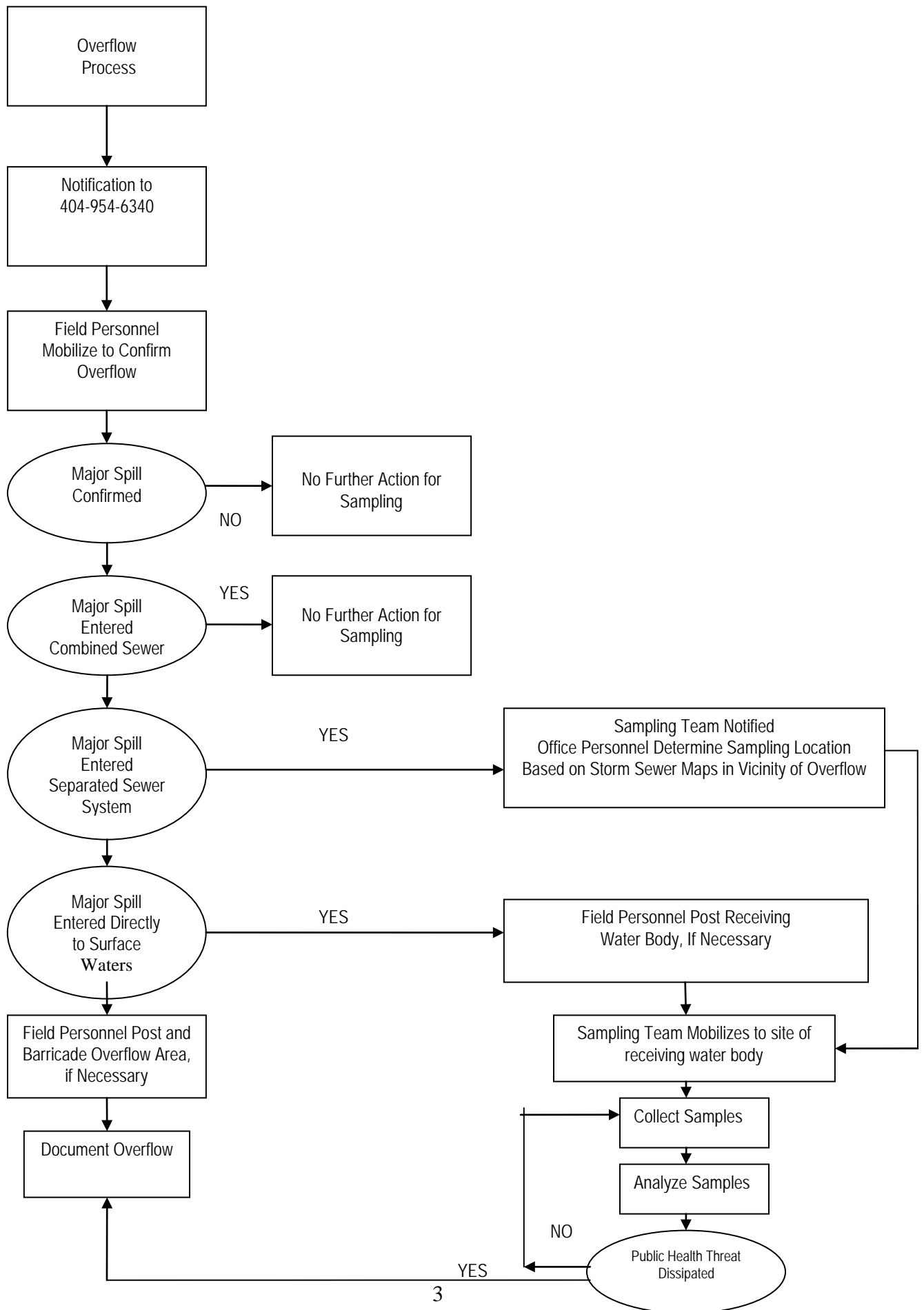
If an overflow is confirmed to have occurred, but not to have entered either a separated storm sewer or directly into a free flowing stream, field personnel will post and barricade the area, and notify the Sampling Team to stand down.

If a major spill is confirmed to have occurred, and to have entered a separated storm sewer, the Sampling Team will be notified to mobilize. Using storm sewer line maps in the vicinity of the SSO, the Sampling Team will first identify a sampling location on a free flowing stream nearest to the outfall of the storm sewer line that the SSO entered. The Sampling Team will then expeditiously proceed to that location, post and barricade the area, and begin sampling activities.

If a major spill is confirmed to have occurred, and to have entered directly into a free flowing stream, field personnel will post and barricade the area in order to control public access, and notify the Sampling team to mobilize. The Sampling Team will sample within 24 hours.

### **Sampling of Receiving Water Body**

Whether the SSO has been discharged directly to a receiving water body, or commingled with storm water and routed to an outfall location, samples are to be collected at an upstream or background location, and at a downstream location selected to reflect a reasonable mixing zone below the entry of the SSO. Samples are to be collected to the extent practicable. During storm events sample collection may need to take place along or in a flowing stream, and appropriate health and safety procedures must be followed at all times. No personnel are to be placed in a situation that could result in injury or death.



Following are recommended sampling protocols for sampling of major spills:

- Sampling and associated monitoring shall be in accordance with established State protocol. (once per day for seven days, once per week for a month, and once per month for a year)
- Sampling team will respond to spills within 24 hours of notification.
- Where spills are less than 10,000 gallons, sampling team will determine if sampling and monitoring is necessary (if a water quality violation occurred). Determination will be based upon either observation (evidence of toxic environment) or the results of sampling upstream and downstream for temperature, dissolved oxygen, fecal coliform, pH and any other parameter as required by GA EPD to determine if water quality standards have been violated.
- Sample upstream and downstream from accessible points to be determined by the sampling team for temperature, dissolved oxygen (DO), fecal coliforms, and pH.
- Sampling team will notify sewer division of initial results.
- If downstream fecal coliform concentration is greater than upstream concentration by a difference greater than an order of magnitude, keep signs posted and resample.
- If downstream fecal coliform concentrations are comparable with upstream concentrations, posted signs may be removed. (note that all signage must be in place for a minimum of seven (7) days)
- If upstream and downstream fecal coliform concentrations are elevated to a degree that indicate a source of fecal contamination, keep area posted and resample.
- If resampling indicates a source of fecal contamination, keep area posted and barricaded; and conduct further investigation to isolate the source of the contamination (if possible).
- Notify the applicable City departments to assist in elimination of the fecal source.

## Sample Analysis

Table 1 provides a list of the parameters that will be analyzed for at all sampling locations.

**Table 1**  
**Analyze Data for SSO Sampling**

<b>Parameter</b>	<b>Method</b>	<b>Preservation</b>	<b>Holding Time</b>
Turbidity	EPA 180.1	None	48 hours
Ph	EPA 170.1	None	15 minutes
Temperature	EPA 150.1	None	15 minutes

Fecal Coliform	SM 9222D	Sodium Thiosulfate	6 hours
Dissolved Oxygen	EPA 360.1	None	15 Minutes

Quantification of turbidity, pH, temperature, and dissolved oxygen will be accomplished *in-situ* through the use of a combined water quality probe capable of analyzing these parameters. Fecal coliform samples will be collected in pre-sterilized containers containing sodium thiosulfate preservation, placed on ice, and released to a laboratory for analysis.

The holding time for fecal coliform samples (6 hours) may require analysis of samples before an SSO event ends. Under these conditions, sampling personnel may need to contact laboratory personnel for on site pick-up and custody transfer, or transport the fecal coliform sample will be kept on ice until analysis occurs.

### **Chain-of-Custody Procedures**

Sampling team personnel must assure that sample chain-of-custody is maintained using appropriate documentation. Attached is a copy of the chain-of-custody form to be used for this purpose. This form provides spaces to record time and date of sample collection, values of in-situ parameter measurements, required analysis, and transfer of samples to laboratory for analysis. The form is divided into separate sections for each hourly sampling interval and provides lines for the respective upstream discharge, and downstream sample locations. The blank suffix in the field sample ID number is intended to be the Sequence Number of the SSO event.

All transfers of sample custody will be on a chain-of-custody form. When practical, custody of samples will be transferred directly from sampling team member to the analytical laboratory.

### **Equipment Decontamination Procedures**

Following each sampling event, the pH/ temperature/turbidity/dissolved oxygen meter will be decontaminated per the manufacture's recommendation.

### **Field Quality Assurance/ Quality Control Procedures**

Field duplicate samples will be collected to validate data. At a minimum, a duplicate fecal coliform sample will be collected every fifth sample per sampling location. Prior to each sampling event, the pH/temperature/turbidity/dissolved oxygen meter will be calibrated pursuant to manufacture's instructions. Following a sampling event, the meter will be post calibration checked to document any instrument drift.

### **Assessment of Public Health Impact**

Given the urban setting of the streams within the City, no significant difference is expected between the values for pH, temperature, dissolved oxygen, and turbidity measured upstream and downstream from an SSO discharge. However, there could be a sufficient difference in fecal coliform concentration to warrant continued posting and

barricading of the affected stream reach. In general, a fecal coliform concentration difference greater by an order of magnitude will mandate continued posting and barricading, and continued sampling.

Included with this memorandum is a copy of the Sanitary Sewer Overflow Report that is to be completed, issued, and filed following all SSO events. This form, with the noted inclusion of related chain.

### **Sanitary Sewer Overflow Sampling Report**

Included with this memorandum is a copy of the Sanitary Sewer Overflow Sampling Report that is to be completed, issued, and filed following all sampled SSO events. This form, with the noted inclusion of related chain-of-custody forms and laboratory analytical results will document the salient information pertaining to the sampled SSO event.

### **Reporting SSO Sampling Activities**

- A. Following major spill sampling activities, copies of the analytical results and associated chain-of-custody forms, along with the copies of any field notes compiled during the sampling effort, will be forwarded to the appropriate Sewer Division contact for inclusion in the documentation related to the SSO.
- B. Analytical results will be reported to EPD using EPD Stream Monitoring Program Form for a Major Spill. A sample of the form is at the end of this appendix.

The EPD form will be mailed to the following address:

EPD – Georgia Environmental Protection Division  
Permitting, Compliance and Enforcement Program  
4220 International Parkway, Suite 101  
Atlanta, Georgia 30354  
ATTN: Carolyn Hill

#### **Attachments (3)**

- EPD Stream Monitoring Program Form for a Major Spill
- Chain-of-Custody Form
- Sanitary Sewer Overflow Sampling Report

## APPENDIX F

### TECHNICAL MEMORANDUM – SSO SAMPLING PLAN

Note: The sampling requirements of this section have been modified to be in accordance with the Rules of the Georgia Department of Natural Resources, Environmental Protection Division, Chapter 391-3-6-.05 Water Quality Control-Emergency Actions (See Appendix G) effective February 23, 2006

# STREAM MONITORING PROGRAM REPORT FORM FOR A MAJOR SPILL

{Attn: Christine Barber [Permitting, Compliance and Enforcement Program] Fax No. 404-362-2691}

Name of City/County: \_\_\_\_\_

Spill Amount: \_\_\_\_\_

Date Spill Occurred: \_\_\_\_\_

Date Spill Reported to EPD: \_\_\_\_\_

Spill Location: \_\_\_\_\_

Date of Public Notice (PN): \_\_\_\_\_

Name of Receiving Stream Affected: \_\_\_\_\_

Upstream Sampling Location: \_\_\_\_\_

Written Report Submitted to EPD: (Y/N)

Downstream Sampling Location: \_\_\_\_\_

Copy of Public Notice Submitted to EPD: (Y/N)

Date Spill Received: \_\_\_\_\_

Time Spill Received: \_\_\_\_\_

SPILL REPORT RECEIVED FROM FAX

	ABOVE							BELOW						
	DATE	DO	p H	AIR T	STR T	TURB	FECAL#	DO	p H	AIR T	STR T	TURB	FECAL#	
DAY 1														
DAY 2														
DAY 3														
DAY 4														
DAY 5														
DAY 6														
DAY 7														
Week 1 Geometric Mean:							#NUM!	#NUM!						
WEEK 2														
WEEK 3														
WEEK 4														
Month 1 Geometric Mean: ( use all 10 data point )							#NUM!	#NUM!						
MONTH 3														
WEEK 1														
WEEK 2														
WEEK 3														
WEEK 4														
Month 3 Geometric Mean:							#NUM!	#NUM!						
MONTH 12														
WEEK 1														
WEEK 2														
WEEK 3														
WEEK 4														
Month 12 Geometric Mean:							#NUM!	#NUM!						

COMMENT: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# STREAM MONITORING PROGRAM REPORT FORM FOR SPILL

{Attn: Carolyn Hill [Permitting, Compliance and Enforcement Program] Fax No. 404-362-2691}

Name of City/County: Atlanta

Spill Amount: Gal

Date Spill Occurred: \_\_\_\_\_

Date Spill Reported to EPD: \_\_\_\_\_

Spill Location: \_\_\_\_\_

Date of Public Notice (PN): \_\_\_\_\_

Name of Receiving Stream Affected: \_\_\_\_\_

Upstream Sampling Location: \_\_\_\_\_

Written Report Submitted to EPD: (Y/N)

Downstream Sampling Location: \_\_\_\_\_

Copy of Public Notice Submitted to EPD: (Y/N)

Date Spill Report Received \_\_\_\_\_

Time Spill Report Received \_\_\_\_\_

SPILL REPORT RECEIVED FROM FAX MACHINE

		UPSTREAM						DOWNSTREAM					
	DATE	DO	pH	AIR TEMP ( °C)	STR TEMP ( °C)	TUR BIDI TY	FCOLI (#/100mls)	DO	pH	AIR TEMP ( °C)	STR TEMP ( °C)	TURB IDITY	FCOLI (#/100mls)
DAY 1													
DAY 2													
DAY 3													
DAY 4													
DAY 5													
DAY 6													
DAY 7													
DAY 8													
DAY 9													
DAY 10													
DAY 11													
DAY 12													
DAY 13													
DAY 14													

COMMENT:

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### **391-3-6-.05 Emergency Actions.**

**(1) Purpose.** The purpose of Paragraph 391-3-6-.05 is to provide procedures to handle any emergency which endangers the waters of the State.

**(2) Definitions.** All terms used in this Paragraph shall be interpreted in accordance with the definitions as set forth in the Act unless otherwise defined in this Paragraph or in any other Paragraph of these Rules.

(a) “Spill” means any discharge of raw sewage by a Publicly Owned Treatment Works (POTW) to the waters of the State.

(b) “Major Spill” means:

1. The discharge of pollutants into the waters of the State by a POTW that exceeds the weekly average permitted effluent limit for biochemical oxygen demand (5-day) or total suspended solids by 50 percent or greater for any one day.

2. Any discharge of raw sewage that (1) is in excess of 10,000 gallons or (2) results in water quality violations in the waters of the State.

(c) “Consistently exceeding an effluent limitation” means a POTW exceeding the 30 day average limit for biochemical oxygen demand or total suspended solids for at least five days out of each seven day period during a total period of 180 consecutive days.

**(3) Notice Concerning Endangering Waters of the State.** Whenever, because of an accident or otherwise, any toxic or taste and color producing substance, or any other substance which would endanger downstream users of the waters of the State or would damage property, is discharged into such waters, or is so placed that it might flow, be washed, or fall into them, it shall be the duty of the person in charge of such substances at the time to forthwith notify the Division in person or by telephone of the location and nature of the danger, and it shall be such person’s further duty to immediately take all reasonable and necessary steps to prevent injury to property and downstream users of said water. The following specific requirements shall apply to POTWS:

(a) The owner of a POTW shall immediately notify the Division, in person or by telephone, when a spill or a major spill occurs in the system. Within five (5) days of the incident, the owner of the POTW shall submit a written report to the Division which includes, at a minimum, the information required in (3)(e) below.

(b) The owner of a POTW responsible for a major spill shall publish a notice of the major spill in the legal organ of the County where the incident occurred. The notice shall be published within seven days after the date of the major spill. The notice as a minimum shall include the following:

1. Date of the major spill;
2. Location and cause of major spill;
3. Estimated volume discharged and name of receiving waters;
4. Corrective action taken to mitigate or reduce the adverse effects of the major spill.

(c) The owner of a POTW shall immediately establish a monitoring program of the waters affected by a major spill or by consistently exceeding an effluent limit, with such monitoring being at the expense of the POTW for at least one year. The monitoring program shall include an upstream sampling point as well as sufficient downstream locations to accurately characterize the impact of the major spill or the consistent exceedence of effluent limitations as described in (2)(c) above. As a minimum the following parameters shall be monitored in the receiving stream:

1. Dissolved Oxygen;
2. Fecal Coliform Bacteria;
3. pH;
4. Temperature.

The monitoring and reporting frequency as well as the need to monitor additional parameters, will be determined by the Division. The results of the monitoring will be provided by the POTW owner to the Division and all downstream public agencies using the affected waters as a source of a public water supply.

(d) The Division and the owner of a POTW will provide notice of a major spill within 24-hours of becoming aware of the major spill to every county, municipality or other public agency whose public water supply is within a distance of 20 miles downstream and to any others which could potentially be affected by the major spill.

(e) The owner of a POTW responsible for a spill or a major spill shall report the incident to the local media (television, radio and print media) within 24 hours of becoming aware of the incident. The report shall include at a minimum the following:

1. Date of the spill or major spill;
2. Location and cause of spill or major spill;
3. Estimated volume discharged and name of receiving waters;
4. Corrective action taken to mitigate or reduce the adverse effects of the spill or major spill.

(f) The owner of a POTW responsible for a spill or a major spill shall immediately report the incident to the local health department(s) for the area affected by the incident. The report shall include at a minimum the same information required in (3)(e) above.

(g) The owner of a POTW responsible for a spill or a major spill shall immediately post a notice as close as possible to where the spill or major spill occurred and where the spill or major spill entered State waters. The notice shall include at a minimum the same information required in (3)(e) above. The intent of this requirement is for the POTW to notify citizens, who may come into contact with the affected water, that the spill or the major spill has occurred. The owner shall also post additional notices of the spill or major spill along the portions of the waterway affected by the incident (i.e. at bridge crossings, trails, boat ramps, recreational areas, and other points of public access to the affected waterway). These notices shall remain in place for a minimum of seven days after the spill or major spill has ceased.

**(4) Noncompliance Notification.** If, for any reason, the permittee does not comply with, or will be unable to comply with any effluent limitations specified in the permittee's NPDES permit, the permittee shall provide the Division with an oral report within 24 hours from the time the permittee becomes aware of the circumstances followed by a written report within five (5) days of becoming aware of such condition. The written submission shall contain the following information:

- (a) A description of the noncompliance and its cause; and
- (b) The period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

**(5) Emergency Orders.** The Director shall have the authority to issue an emergency order pursuant to Section 20 of the Act, and Section 17(a) of the Executive

Reorganization Act of 1972, as amended.

**(6) Effective Date.** This Rule shall become effective twenty days after filing with the Secretary of State's Office.

Authority O.C.G.A. Sec. 12-5-20 et seq. **History.** Original Rule entitled "Emergency Actions" adopted. F. June 10, 1974; eff. June 30, 1974. **Amended:** F. Apr. 3, 1990; eff. Apr. 23, 1990. **Amended:** ER. 391-3-6-0.32-.05, adopted. F. May 1, 1996; eff. Apr. 25, 1996, the date of adoption, to be in effect for 120 days or until the effective date of a permanent Rule covering the same subject matter is adopted, as specified by the Agency. **Amended:** Permanent Rule adopted. F. July 10, 1996; eff. July 30, 1996. **Amended:** F. May 31, 2001; eff. June 20, 2001.

## **APPENDIX H**

### **EXAMPLES OF WRITTEN BULLETINS AND SIGNAGE FOR SEWER OVEFLOW EVENTS**

## Appendix H

### Examples of Bulletins and Posting Procedures For Sewer Overflow Events

Figure H-1

PRE-SCRIPTED BULLETIN – INITIAL NOTIFICATION
<p>CITY OF ATLANTA DEPARTMENT OF WATERSHED MANAGEMENT (LETTERHEAD)</p> <p>FOR IMMEDIATE RELEASE</p> <p>(DATE AND TIME)</p> <p><u>(Identified cause of overflow such as pipe collapse, or pumping station failure, such as mechanical breakdown or natural cause [lightning or local flooding]) near the intersection of (street name) and (street name) has caused a sewer overflow into (surface water name) in (area name).</u></p> <p>Although Department crews have begun to make temporary repairs <u>(and divert some of the flows to and/or interim bypass pumping has begun)</u>, backups may occur in portions of the system. Consequently, residents <u>(reference area or location on map)</u> are urged to reduce water usage inside the home as much as possible and avoid coming into physical contact with standing waters in the street or using <u>(receiving surface water)</u> for any purposes until further notice.</p> <p>Please note that the drinking water supply is not affected. However, the cooperation of residents to minimize water usage in order to reduce sewage flows is of the utmost importance.</p> <p>CONTACT:</p> <p>Public Information Officer XXX-XXX-XXXX</p>

**Figure H-2**

<b>PRE-SCRIPTED BULLETIN – REPAIR UPDATE</b>
<p style="text-align: center;">CITY OF ATLANTA DEPARTMENT OF WATERSHED MANAGEMENT (LETTERHEAD)</p> <p>FOR IMMEDIATE RELEASE</p> <p>(DATE AND TIME)</p> <p><u>(Identified cause of overflow such as pipe collapse, or pumping station failure, such as mechanical breakdown or natural cause [lightning or local flooding])</u> near the intersection of <u>(street name)</u> and <u>(street name)</u> has caused a sewer overflow into <u>(surface water name)</u> in <u>(area name)</u>. Repair crews were dispatched to access the extent of damage and to initiate repairs. To date, the following actions have been taken:</p> <p style="text-align: center;">[Description of work accomplished]</p> <p>It is anticipated the repair work will be completed by <u>(date/time)</u>. Additional advisories will be issued if the status of the repairs should change.</p> <p>Citizens are cautioned to refrain from visiting the area where the repair efforts are being conducted.</p> <p>CONTACT:</p> <p>Public Information Officer XXX-XXX-XXXX</p>

**Figure H-3**

<b>PRE-SCRIPTED BULLETIN – WATER CONSERVATION</b>
<p style="text-align: center;">CITY OF ATLANTA DEPARTMENT OF WATERSHED MANAGEMENT (LETTERHEAD)</p> <p>FOR IMMEDIATE RELEASE</p> <p>(DATE AND TIME)</p> <p><u>(Identified cause of overflow such as pipe collapse, or pumping station failure, such as mechanical breakdown or natural cause [lightning or local flooding])</u> near the intersection of <u>(street name)</u> and <u>(street name)</u> has caused a sewer overflow into <u>(surface water name)</u> in <u>(area name)</u>. The leak has caused portions of <u>name of surface water</u> to become polluted and necessitates reducing the discharge of sewage to the sewer system.</p> <p>In order to prevent backups in the sewer system and sewage spills, residents are urged to reduce household water use. Actions residents should take are:</p> <ol style="list-style-type: none"><li>1. Limit clothes washing.</li><li>2. Limit use of showers and baths.</li><li>3. Limit toilet flushing.</li></ol> <p>It is necessary to restrict water use only for the period required to fix the leak. Department crews have already begun to make repairs. Advisories will be issued when the repairs are completed so normal water use can resume.</p> <p>The break does not affect the water supply. The water is safe to drink, but please limit water use to reduce sewage flow as much as possible.</p> <p>CONTACT:</p> <p>Public Information Officer XXX-XXX-XXXX</p>

Figure H-4

<b>PRE-SCRIPTED NEWS BULLETIN – NAME OF AFFECTED SURFACE WATER) ADVISORY</b>
<p style="text-align: center;">CITY OF ATLANTA DEPARTMENT OF WATERSHED MANAGEMENT (LETTERHEAD)</p> <p>FOR IMMEDIATE RELEASE</p> <p>(DATE AND TIME)</p> <p><u>(Identified cause of overflow such as pipe collapse, or pumping station failure, such as mechanical breakdown or natural cause [lightning or local flooding])</u> near the intersection of <u>(street name)</u> and <u>(street name)</u> has caused a sewer overflow into _____ River. Repair efforts are underway.</p> <p>Discharge of untreated sewage to _____ River may adversely affect the quality of the surface waters. Citizens are advised to avoid swimming or fishing in the areas where warning signs are posted.</p> <p>The waters of _____ River in the vicinity of the overflow are being tested and monitored by the Department's Inspection &amp; Monitoring Unit to determine the extent of pollution. Additional advisories will be issued on the status of the water quality and when it is safe to resume normal use of the river's water.</p> <p>CONTACT:</p> <p>Public Information Officer XXX-XXX-XXXX</p>



Figure H-5

PRE-SCRIPTED BULLETIN – CLOSING STATEMENTS
<p style="text-align: center;">CITY OF ATLANTA DEPARTMENT OF WATERSHED MANAGEMENT (LETTERHEAD)</p> <p>FOR IMMEDIATE RELEASE</p> <p>(DATE AND TIME)</p> <p>(Identified cause of overflow such as pipe collapse, or pumping station failure, such as mechanical breakdown or natural cause [lightning or local flooding]) near the intersection of (street name) and (street name) has caused a sewer overflow into (surface water name) in (area name). The system failure, causing the discharge of approximately _____gallons of sewage to (name of surface water), resulting in restricted public access.</p> <p>Department personnel were rapidly mobilized to take immediate and effective action. The repairs were completed in (hours or days).</p> <p>The Department worked in cooperation with the Georgia Environmental Protection Division and Fulton County Health Department in monitoring the water quality and environmental effects of the sewage overflow on (name of surface water). As a result, the impacts of the accidental sewage discharge were minimized. The water quality in (name of surface water) is continuing to be monitored to ensure there are no threats to public health and the environment.</p> <p>CONTACT:</p> <p>Public Information Officer XXX-XXX-XXXX</p>

CITY OF ATLANTA  
Shirley Franklin, Mayor



City Council  
Lisa M. Borders  
President

Carla Smith  
Ivory Lee Young, Jr.  
Natalyn Mosby Archibong  
Howard Shook  
Felicia A. Moore  
Jim Maddox  
Mary Norwood  
Ceasar Mitchell

Kwanza Hall  
Cleta Winslow  
Anne Fauver  
Clair Muller  
Clarence T. Martin  
Joyce Sheperd  
H. Lamar Willis

Department of Watershed Management  
Bureau of Wastewater Treatment and Collection  
360 Englewood Avenue, S.E.  
Atlanta, Georgia 30315  
404-624-0751

Figure H-6

<p style="text-align: center;"><b>City of Atlanta</b></p> <p style="text-align: center;"><b>Department of Watershed Management</b></p> <div style="display: flex; justify-content: space-around; align-items: center;"><div style="text-align: center;"><p><b>WARNING!!!</b></p></div></div>	
<p>Discharge of untreated sewage to _____ River/Creek occurred on _____ and may adversely affect the quality of surface waters in the surrounding areas.</p> <p>You are advised to avoid swimming or fishing in the River/Creek and to keep children from playing near the area.</p> <p>The waters of _____ River/Creek in the vicinity of the sewage overflow are being tested and monitored by the Department of Watershed Management to determine the extent of the pollution.</p> <p>DATE: _____</p> <p>SPILL LOCATION: _____ _____</p> <p>CAUSE OF SPILL: _____</p> <p>DISCHARGED VOLUME: _____ Gallons</p> <p>CORRECTIVE ACTION: _____ _____</p> <p style="text-align: center;"><b>For 24 hour information or to Report any further Sewer Problems, please call the Bureau of Wastewater Treatment and Collection 404-954-6340</b></p>	

**CUIDADO**

**ESTAS AGUAS FUERON  
IMPACTADAS POR UN  
DERRAME DE DRENAJE EL**

**, 20**



**NO JUEGE, NADE O PESQUE EN  
ESTAS AGUAS HASTA QUE ESTE  
AVISO HAYA SIDO QUITADO**

**PARA MAS INFORMACION O PREGUNTAS LLAME**

**404-624-0753**

# WARNING

**This waterway was impacted by a  
sewage spill on  
\_\_\_\_\_, 20\_\_\_\_\_**



**Do Not Play, Swim or Fish in  
this waterway until after this  
sign has been removed**

**For more information or questions call  
404-624-0753**



**CUIDADO**

**PARE**

**EL AREA ASEGURADA  
A SIDO CONTAMINADA  
CON DRENEJE**

**NO ENTRE**

**POR FAVOR LLAME  
404-624-0753  
SI TIENE CUALQUIER PREGUNTA**



**STOP**

**The secured area has  
been contaminated with  
sewage**

**DO NOT ENTER**

**Please call  
404-624-0753  
if you should have any  
questions.**

**APPENDIX I**

**CITY OF ATLANTA**

**SUPERVISORS, MANAGERS AND STAFF TELEPHONE LISTS**



*City of Atlanta*  
**DEPARTMENT OF WATERSHED MANAGEMENT**  
**WASTEWATER SERVICES DIVISION**

<b>REVISED EMERGENCY OPERATING PROCEDURE NO. PS-5.3</b>				
<b>PUMP STATION CALL LIST</b>				
<b>Verify and edit this call list at least once per month. This list was last updated:</b> May 5, 2008				
<b>SUPERVISOR CALL LIST</b>				
<b>Supervisor</b>	<b>Phone</b>	<b>Radio</b>	<b>Pager/Cell</b>	<b>Home Phone</b>
Intrenchment Creek	(404) 241-0116		--	--
Albert Askew	(404)241-0116		(404)569-5351	(478)474-8268
Derrick Lindsey	(404) 799-5159	101	(678) 794-2131	(404) 761-0049
Deborah Troutman	(404) 241-0116		(404) 319-4370	(770) 819-1274
Jeff Page	(404) 241-0116	1A	678-300-4041	770-749-0209
Leonard Warbington	(404) 241-0116	1A	678-300-7408	(770) 883-5485
<b>MAINTENANCE CALL LIST</b>				
<b>Name</b>	<b>Phone</b>	<b>Radio</b>	<b>Pager/Cell</b>	<b>Home Phone</b>
<b>Primary call list for South River Drainage areas.</b>				
Mech,RandyHendrix	(404) 350-6120	107	(404) 571-1077	(770) 489-3885
Mech, Rick Gosch	(404 350-6110		(678) 300-7128	
<b>Primary call list for R M Clayton Drainage area.</b>				
Contact WRC Manager				
<b>Primary call list for Utoy Creek Drainage area.</b>				
Mech, Joel Roach	(404) 799-5159	104	(404) 278-4551	(770) 942-7291
Elect, Steven Jones	(404) 215-5641		(404) 650-7484	(404) 758-9260
Maint. Mgr, Johnny Lee	(404) 215-5643		(770) 294-2048	(770) 363-0312
<b>WRC MANAGER CALL LIST</b>				
<b>Manager</b>	<b>Phone</b>	<b>Radio</b>	<b>Pager/Cell</b>	<b>Home Phone</b>
Tony Richardson, S River	(404) 350-6116		(404) 569-5982	(770) 914-7792
Rob Bush, RM Clayton	(404) 350-4902		(404) 391-1854	
Mike Shelhamer, Utoy	(404) 215-5637		(404) 650-9757	(404) 489-7990

<b>INSPECTION &amp; MONITORING CALL LIST</b>			
<b>INSPECTOR</b>	<b>PHONE</b>	<b>PAGER/CELL</b>	<b>HOME PHONE</b>
<b>I &amp; M Office</b>	404-350-4909		
Marcella Flowers	404-546-1359	404-379-6785	770-774-1140
Renee Williams	404-546-1363	404-925-8319	404-766-3132

George Patterson	404-546-1365	404-886-1595	770-459-0128
Michael Chandler	404-546-1362	404-925-8320	678-945-7173
Patrick Woodall	404-546-1354	404-557-3594	770-947-6077
Denise Skinner-Hurst	404-546-1352	404-557-4347	678-817-0752
Mgr., Tracy Hillick	404-546-1351	404-557-9352	770-928-9079
<b>SUPPORT CONTACTS</b>			
<b>Sewer Services Rep.</b>	404-624-0751	<b>Fire Dept. Hazmat</b>	404-658-7175
<b>James McClain</b>	404-787-2004	<b>Water Department</b>	404-658-6500
<b>Customer Service</b>	404-954-6340		

**DEPARTMENT OF WATERSHED MANAGEMENT  
SEWER OPERATIONS DIVISION**

Primary Contact: Reginald Wells, Watershed Manager, Senior  
Tel: 404-635-2641      FAX: 404-622-2048  
Cell: 404-294-3053      Radio:

Primary Contact: Danny Mathis, Wastewater Collection Superintendent  
(Construction Emergency) Tel: 404-635-2647      Fax:  
Cell: 678-414-4718      Radio: 806

Secondary Contact: Kimbry Peek, Wastewater Collection Superintendent  
(Alternate 1) Tel: 404-635-2613      Fax: 404-546-8613  
Cell: 770-294-2737      Radio: 534

Secondary Contact: Kelvin Gray, Wastewater Collection Superintendent  
(Alternate 2) Tel: 404-635-2617      Fax: 404-658-6288  
Cell: 404-787-4481      Radio: 571

Secondary Contact: Bruce Rasheed, Wastewater Collection Superintendent  
(Alternate 3) Tel: 404-685-0243      Fax: 404-685-0249  
Cell: 404-925-8322      Radio: 124

*City of Atlanta*  
**DEPARTMENT OF WATERSHED MANAGEMENT**  
**WASTEWATER SERVICES DIVISION**

**REVISED EMERGENCY OPERATING PROCEDURE NO. PS-5.4**  
**Wastewater Collections Call List**

**Verify and edit this call list at least once per month. This list was last updated:**  
June 16, 2008

**SUPERINTENDENT CALL LIST**

<b>Supervisor</b>	<b>Phone</b>	<b>Radio</b>	<b>Pager/Cell</b>	<b>Home Phone</b>
Kelvin Gray	(404) 635-2617	571	(404) 787-4481	(404) 212-1444
Kimbry Peek	(404) 635-2613	534	(770) 294-2737	(404) 243-4494
Bruce Rasheed	(404) 685-0243	124	(404) 925-6322	
Danny Mathis	( 404) 635-2646	806	(678) 414-4718	(770) 774-0736

**SECTION SUPERVISOR CALL LIST**

Mashawn Johnson	(404) 685-0243	562	(404) 787-1589	(404) 381-9334
Jim Seufferlein	(404) 635-2612		(770) 294-2045	(770) 795-8599
Giselle Melville	(404) 624-0753		(404) 557-1690	(770) 562-4259
Sammy Glynn	(404) 624-0751	505	(770) 294-3196	(404) 756-0386
Michael Teasley	(404) 685-0232	PM1	(404) 227-6738	(404) 767-6373
Chris Harris	(404) 635-2620	68	(770) 294-3082	(706) 252-1007

**OPERATIONS - MAINTENANCE CALL LIST**

<b>Name</b>	<b>Phone</b>	<b>Radio</b>	<b>Pager/Cell</b>	<b>Home Phone</b>
All Quadrants				
Richard Wise	(404) 624-0751	576	(770) 294-3236	(770) 909-1314

## APPENDIX J

### SOP FOR SANITARY SEWER OVERFLOW REPORTING TO GOVERNMENTAL AGENCIES

# **Standard Operating Procedure**

## **Sanitary Sewer Overflow Reporting to Government Agencies**

### **1. PURPOSE**

The purpose of this procedure is to establish standard procedures for preparing and submitting overflow reports required by the City's wastewater Consent Decrees to the United States Environmental Protection Agency (EPA) and the Georgia Environmental Protection Division (EPD) and the other government agencies.

### **2. BACKGROUND**

As part of the consent Decrees entered into with EPA and EPD, the City of Atlanta is required to submit various documents and correspondence to the regulatory agencies. Section XX of the Combined Sewer Overflow and First Amended Consent Decrees describes the procedures that the City must follow when making all required submittals. Section XX states that *"...Notification to or communications with EPA, the United States Attorney or the Department of Justice ("DOJ"), the State of Georgia ("Department of Law") and the EPD shall be deemed submitted on the date they are postmarked and sent by certified mail, return receipt requested or deposited with an overnight mail/delivery service...."*.

The City of Atlanta has elected to submit all city overflows to creek reports and Work-In-Progress Letters via certified mail. The following are steps to be followed when submitting reports to EPA and EPD and other government agencies as required.

### **3. PROCEDURE**

#### **Preparation of the Spill Reporting Manifest List Form**

For every Consent Decree submittal, a Manifest List Form must be completed. A sample of the form is at the end of this appendix. Begin by entering the date of spill or date of work in progress letter, service request number, address, last four digits of the EPA and EPD tracking number. Write the corresponding Certified Mail tracking numbers for EPA and EPD at the bottom of the Manifest List Form .

#### **Submittal Preparation Activities**

## **Mailing Address Labels**

Individual mailing address labels shall be prepared for each recipient. Addresses for the EPA and EPD are as follows: (Additional agencies & addresses for distribution copies are included in Appendix A)

EPA

Chief, Water Programs Enforcement Branch

Water Management Division

U.S. Environmental Protection Agency, Region 4

Atlanta Federal Center

61 Forsyth Street, S.W.

Atlanta, GA 30303

ATTN: David Phillips

EPD

Georgia Environmental protection Division

Permitting, Compliance and Enforcement

4220 International Parkway, Suite 101

Atlanta, GA 30354

ATTN: Ted Hendrickx

## **Certified Mail Receipts (PS Form 3800)**

U.S. Postal Service Certified Mail Receipt forms (Postal Service Form 3800 or “white forms”) shall be prepared. Receipts shall be typewritten or printed neatly using the addresses listed in Section 3.1.1 above. Steps for completing the Certified Mail Receipt include:

1. Enter point of contact name and agency on **“SENT TO”** line.
2. Enter street address and suite number on **“STREET, APT. NO; or PO BOX NO.”** line.
3. Enter city, state, and zip code information on **“CITY, STATE, & ZIP+4”** line.
4. The Certified Mail Receipt contains a 20-digit tracking number located just below the barcode. This number is used as a reference number on the Return Receipt card as well as the submittal correspondence and the Consent Decree Submittal Checklist.

## **Return Receipt Card (PS Form 3811)**

Domestic Return Receipt Cards (Postal Service Form 3811 or “green cards”) shall be prepared. Receipts shall be typewritten or printed neatly using the addresses listed in Section 3.1.1 above. Steps for completing the Return Receipt Card include:

1. Complete **“PRINT YOUR NAME, ADDRESS, AND ZIP+4 IN THIS BOX”** information with the following address.

City of Atlanta  
Department of Wastewater Treatment and Collections  
360 Englewood Avenue, SE  
Atlanta, GA 30315  
ATTN: Spill Specialist's Name

2. Turn the card over. Complete Section 1, **“ARTICLE ADDRESSED TO:”** portion of using addresses listed in Section 3.2.1 above.
3. Enter Certified Mail tracking number shown on Certified Mail Receipt (i.e. “white form”) in Section 2, **“ARTICLE NUMBER”** portion of green card.
4. Check “Certified Mail” box in Section 3, **“SERVICE TYPE”**, of green card.

### **Placing Document(s) in Envelope**

Place a copy of the document(s)/item(s) to be sent in an appropriately sized envelope. A manifest list of all document(s) shall be included in the envelope.

If multiple envelopes are required, separate Certified Mail Receipt forms and Return Receipt cards must be completed for each envelope.

### **Attachment of Certified Mail Receipt & Return Receipt Card to Envelope**

Original Certified Mail receipt Forms and Return Receipt cards shall be attached to the corresponding envelope or package with the Certified Mail Receipt attached to the right of the return address and the Return Receipt Card on the back of the envelope. Make a copy of all documents and the manifest list before closure of envelope (s).

### **Pre-Posting the Submittal**

If an internal Pitney Bowes postage machine is available, it may be used to calculate and process the postage required for mailing the submittal. The package will still need to be taken to the Post Office for certification of mailing, but no payment will be required.

### **QA/QC of Documents**

Prior to sealing of each envelope, an independent verification of its contents and the attached postal forms shall be made by someone other than the party who initially placed the items into the envelope. Once the QA/QC verification

is received, the envelope may be sealed and taken to the Post Office to be mailed.

## **Document Distribution**

### **Consent Decree Submittal**

A Consent Decree Submittal Log & Chronological File will be kept in the PMT Document Control Manager's office. Procedures for the certified mailing of the submittal are detailed in Section 3.4.

3.3.1.1 A temporary suspense file (including the Manifest List) will be created and maintained to track and have submittals available to immediately attach the Return Receipt Card when it is received. Once the Return Receipt Card is attached to the submittal, the submittal will be filed with original documentation.

## **Certified Mailing of the Submittal**

### **Regular Business Hours**

Packages that are ready for mailing prior to 4:30 P.M. shall be taken to the nearest post office facility.

### **Presentation to Postal Clerk**

Upon arrival at the Post Office, present the package to be mailed, along with the attached Certified Mail Receipt from and Return Receipt card to the Postal Clerk. The Postal Clerk will weigh the package and determine the charges associated with the mailing. Once the appropriate charges have been determined, the postal clerk will complete the **"POSTAGE, CERTIFIED FEE, RETURN RECEIPT FEE, RESTRICTED DELIVERY FEE, and TOTAL POSTAGE FEES"** sections of the Receipt for Certified Mail. Next, the Post Office's "postmark" stamp will be applied to the receipt in the **"POSTMARK OR DATE"** section of the Receipt for Certified Mail form.

### **Certified Mail Receipt**

The bottom portion of the Certified Mail Receipt will be presented back to the customer. This portion of the form shall serve as the receipt that the package was submitted on the date stamped on the form. Upon returning from the Post Office, staple each Certified Mail Receipt to the upper right hand corner of the copied manifest list form and place into the temporary file.

### **Return Receipt Card**



When the addressee receives the submittal, the Return Receipt Card is signed, dated, and returned to the sender via U.S. Mail. When the card is returned, it should be attached to the lower right hand corner of the manifest list form and remove from the temporary file and placed in a binder.

### **Payment (if Required)**

Section 3.1.5 includes the procedure for pre-posting the submittal. This is the preferred method of payment for submittals. If this was not done, or if the postage was underestimated, the customer must pay for the remaining postage. Payment shall be made to the postal clerk once total charges are determined for mailing all packages. Payment for certified mailing may be made using cash or via major credit card (AMEX, VISA, MasterCard). If payment is required, the customer should make the payment and be reimbursed according to the policy set by his or her employer.

### **Postal Service Receipt**

Following payment, the postal clerk will present the customer with a postal service receipt. Even if there is no payment required, the customer should still ask for a Postal Service Receipt to document the transaction. This receipt should be retained as part of the submittal documentation. It may be stapled directly to the copy of the receipt made in Section 3.2.4.

### **Follow-Up/Tracking Activities**

#### **Immediate Action Plan for Missing Documents**

If EPA and/or EPD notify the City designee that they have not received an overflow report, duplicate copies will be forwarded to one or both agencies. One copy of each missing submittal shall be hand delivered (to the primary point of contact at EPA and/or EPD. This delivery shall take place within one day of notification by EPA and/or EPD that they are not in receipt of a submittal. The copy will also be sent via fax or certified mail whichever is deemed most appropriate.

#### **Submittal File Documents**

The documents that should be retained in the submittal file include the following:

- Certified Mail Receipt
- Return Receipt Card
- Postal Service Receipt
- Manifest list

# ERP Appendix K

## AREA-WIDE MONITORING PROGRAM AND INVESTIGATIVE APPROACH

### Purpose

The purpose of the Area-wide Monitoring Program and Investigative Approach is to provide a routine monitoring program for identification of fecal coliform spikes in receiving waters possibly triggering the need for further investigation. This program is supplemental to other reporting and investigative procedures associated with spills from the City's collection system as described specifically in ERP Appendix F and other relevant sections of the ERP.

### Geographic Area

Eight locations are monitored representing most of the watersheds identified within the City's jurisdiction. Table K-1 lists these stations. These locations represent a combined tributary area of approximately three-quarters of the total City area (See Figure K-1).

TABLE K-1  
Summary of Sampling Station Information

Station ID	Location	Rationale
<i>Chattahoochee River Basin</i>		
NAN-1	Nancy Creek at W. Wesley Road	Located to evaluate the flows and loads from Nancy Creek prior to confluence with Peachtree Creek; historical SSOs of concern; not supporting designated uses.
NAN-3	Nancy Creek at Rickenbacker Drive	Located to evaluate the contribution into the City from DeKalb County, downstream of the Veteran's Hospital Trunk Improvements; not supporting designated uses.
PEA-2	Peachtree Creek at Northside Drive	Co-located with an existing USGS station, downstream of the inputs from Tanyard Creek and Clear Creek CSOs; not supporting designated use
PRO-1	Proctor Creek at James Jackson Parkway	Located to evaluate the cumulative flows and loads from Proctor Creek before confluence with Chattahoochee River; co-located with a USGS station; not supporting designated uses.
WOO-1	Woodall Creek at DeFours Ferry Road	Newly added station that showed signs of impact from industrial land uses from the synoptic sampling, partially supporting designated uses.
SAN-1	Sandy Creek at Bolton Road	Evaluate the cumulative flows and loads of the tributary before the confluence with the Chattahoochee River; not supporting designated uses.
UTO-1	Utoy Creek at Great Southwest Parkway	Located to evaluate the cumulative flows and loads from Utoy Creek prior to the confluence with the Chattahoochee River; not supporting designated uses.
<i>Ocmulgee River Basin</i>		
SOU-1	South River at Forrest Park Road	Located to evaluate the loads and flow leaving the City into DeKalb County; not supporting designated uses.

## Frequency

Sampling for fecal coliform will occur every other week throughout the year resulting in a total of 26 samples obtained from each location.

## Parameters

Monitored parameters will include those which were most pervasive during the characterization effort performed under the Long-term Watershed Monitoring Program (LTWMP), or may become an issue as the watersheds continue to be developed, including but not limited to fecal coliform, ammonia, total suspended solids, total phosphorus, total organic carbon, nitrites and nitrates. In situ parameters will be measured including dissolved oxygen, temperature, conductivity, pH, and turbidity.

## Methodology

The City establishes site specific threshold, or trigger, levels for fecal coliform bacteria using data acquired under the LTWMP and a frequency of sampling to ensure that spikes indicative of a wastewater discharge from the City's collection system are detected. The objective is to avoid setting a trigger level that result in the City initiating investigations at fecal coliform levels resulting from wet weather non-point sources or background conditions. (See Figure K-2.)

The triggers are developed by evaluating data collected under the LTWMP. The 90<sup>th</sup> percentile of the distribution of data is determined for each location. For example, in the data set represented on Table K-2, the numbers of events sampled at each location exceeding the 90<sup>th</sup> percentile could have resulted in field investigations in search of a wastewater source(s) from the City collection system. The concept of fecal coliform trigger ranges and investigative procedures are illustrated in Figures K-2 and K-3, respectively.

TABLE K-2  
Summary of Distribution of Sampling Data  
*Proposed City of Atlanta ERP Revisions*

	NAN-1	NAN-3	PEA-2	PRO-1	WOO-1	SAN-1	UTO-1	SOU-1
Total Events Sampled	37	32	33	35	26	36	42	42
90th percentile (col/100 mL)	48,000	11,000	42,000	21,000	53,000	10,000	27,000	96,000
Events Exceeding the 90th percentile	4	3	3	4	3	3	4	4

## State Rules and Standard Operating Procedures

Georgia Department of Natural Resources (GADNR). 2004. Draft: Standard Operating Procedures-Freshwater Macroinvertebrate Biological Assessment. Environmental Protection Division.

Georgia Department of Natural Resources (GADNR). 2005. Draft: Standard Operating Procedures for Conducting Biomonitoring on Fish Communities in the Piedmont Ecoregion of Georgia. Wildlife Resources Division, Fisheries Section.

Georgia Department of Natural Resources (GADNR). 2004. Rules and Regulations for Water Quality Control. Chapter 391-3-6. Revised November 2004.

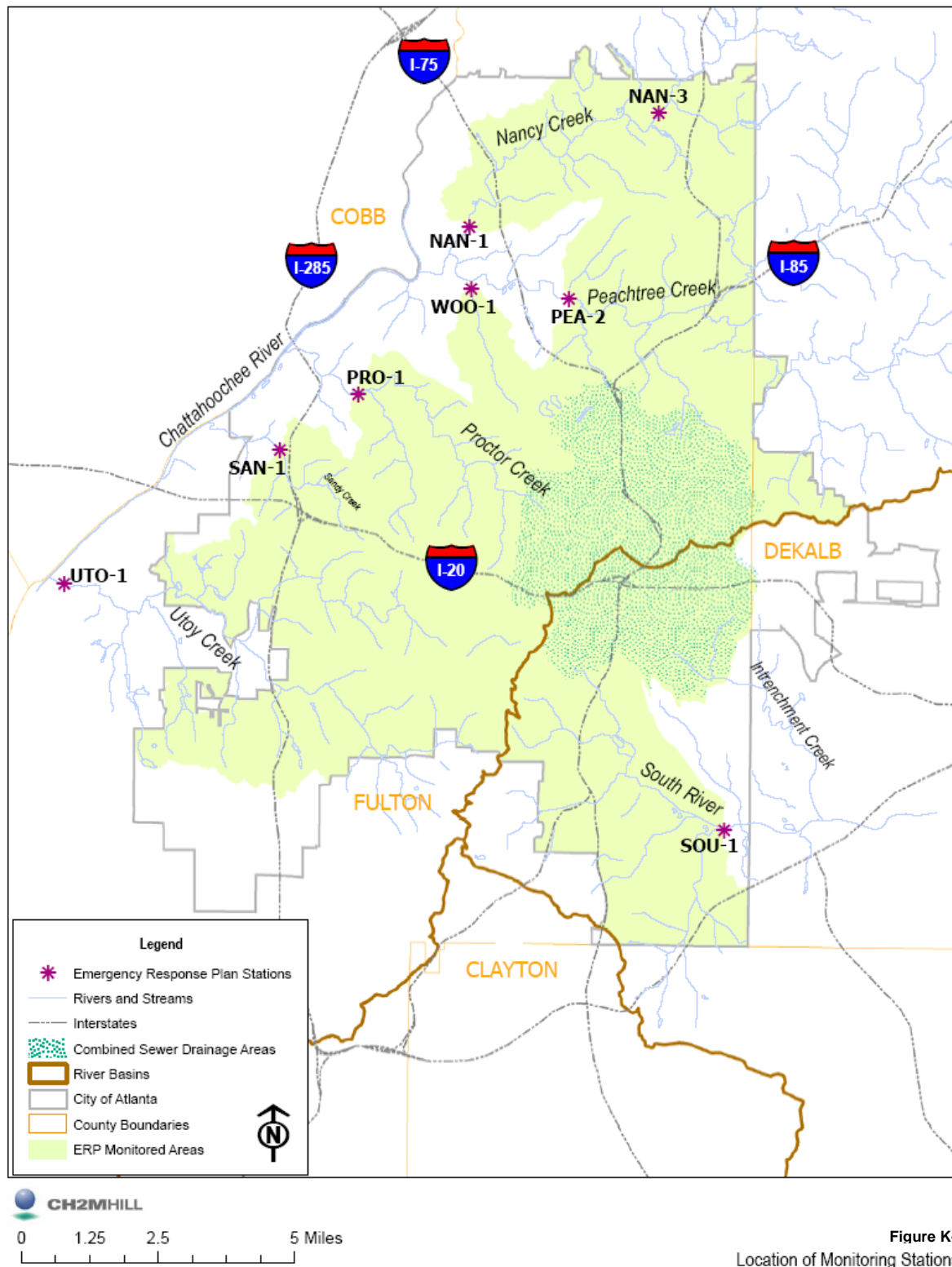
### **Investigation Standard Operating Procedures**

See Figure K-3.

Responsibility for Implementation – Environmental Compliance/Inspection & Monitoring  
Division of Sewer Operations

### **Report and Review**

The 90<sup>th</sup> percentile fecal coliform trigger levels will be re-evaluated every two years with results reported to EPA/EPD. As improvements are made to the City's combined and sanitary sewer systems resulting in decreased volumes and frequencies of treated and untreated wastewater discharges to waterways, the trigger levels may require adjustment to ensure proper sensitivity and efficacy of investigations.



**Figure K-1**  
Location of Monitoring Stations

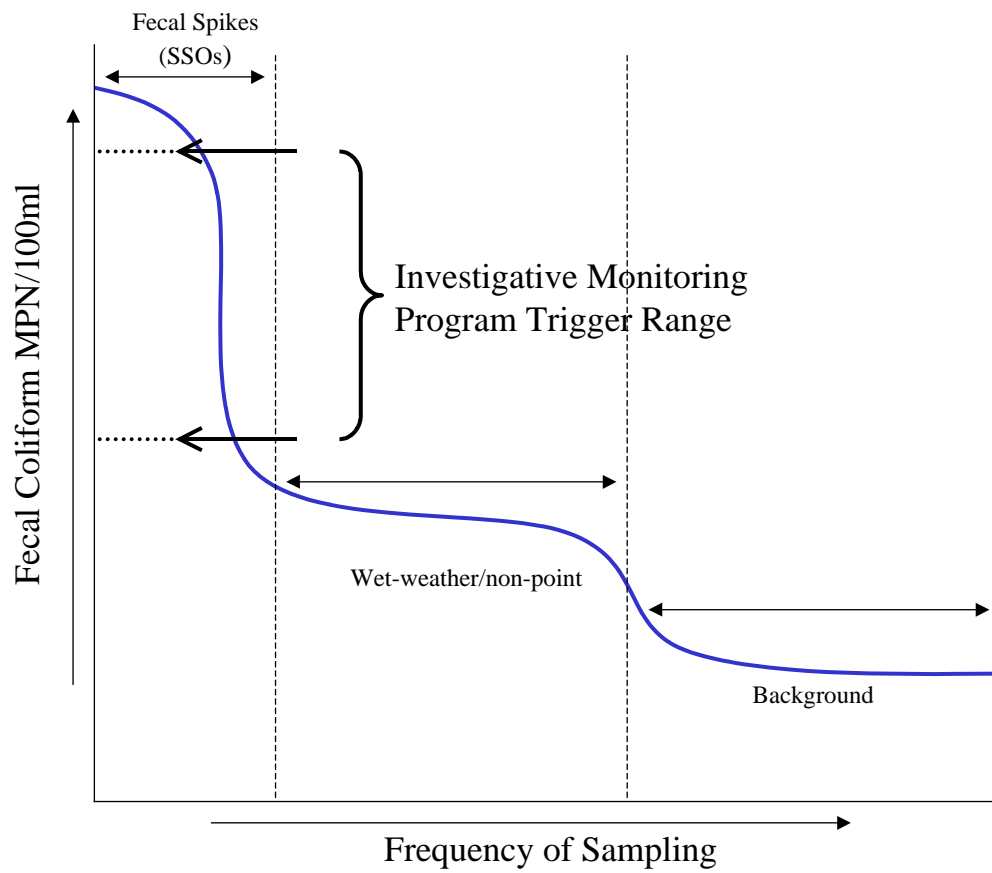
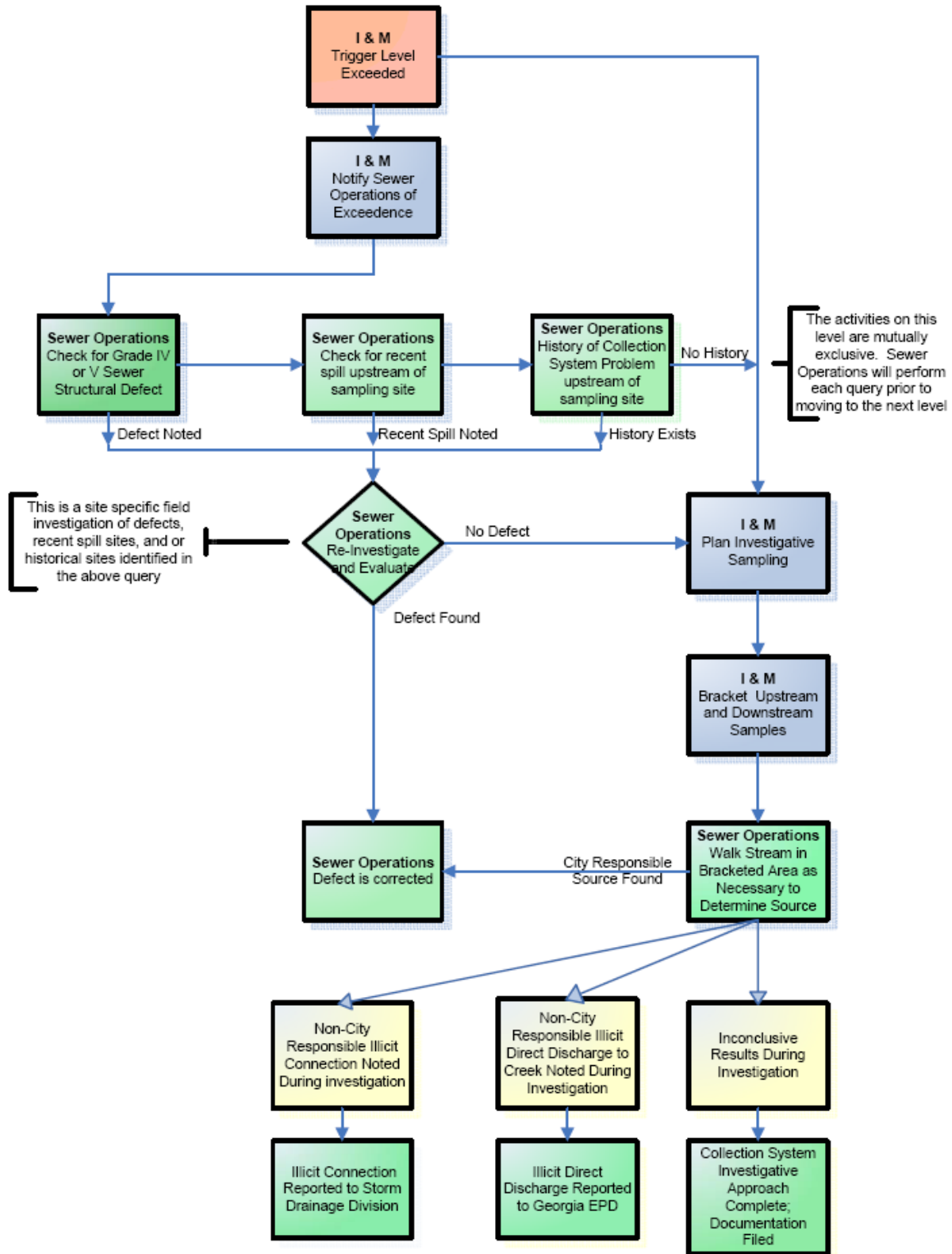


Figure K-2



**Figure K-3**  
Flow Chart for Investigative Monitoring Approach  
Emergency Response Plan

1/18/06

Public Works Department  
Sewer Maintenance and Construction  
Work Return Form

Date \_\_\_\_\_ Travel Time \_\_\_\_\_ Start Time \_\_\_\_\_ End Time \_\_\_\_\_  
Service # \_\_\_\_\_ Work Order # \_\_\_\_\_  
Address \_\_\_\_\_ Descr. Of Request: \_\_\_\_\_  
U/S M/H ADDRESS \_\_\_\_\_ U/S MANHOLE ID \_\_\_\_\_  
D/S M/H ADDRESS \_\_\_\_\_ D/S MANHOLE ID \_\_\_\_\_  
Location (Identify landmarks if Outfall or Trunk) \_\_\_\_\_

CHECK MAINLINE BY DOING ONE OF THE FOLLOWING:

WAS PROBLEM FOUND IN MAINLINE? Y N

\_\_\_\_\_ WM011 CLEAN, MAIN LINE - JET ROD  
\_\_\_\_\_ WM012 CLEAN, MAIN LINE - MECH ROD  
\_\_\_\_\_ WM013 CLEAN, MAIN LINE - VACTOR

\_\_\_\_\_ STP01 STOPPAGE-GREASE IN LINE  
\_\_\_\_\_ STP02 STOPPAGE-ROOTS IN LINE  
\_\_\_\_\_ STP03 STOPPAGE-COLLAPSED LINE  
\_\_\_\_\_ STP04 STOPPAGE-OBSTRUCTION/DEBRIS  
\_\_\_\_\_ STP05 STOPPAGE-OTHER CAUSES (SEE COMMENTS)  
\_\_\_\_\_ PM01 UNSCHEDULED PREVENTATIVE MAINTENANCE

Distance to stoppage \_\_\_\_\_ Linear Feet  
LINEAR FEET CLEANED: \_\_\_\_\_

If no problem is found in Mainline after cleaning, check PM01 →

\*Describe inspection process in comments:

IS ADDITIONAL WORK REQUIRED ON MAINLINE? Y N

WHY IS WORK NEEDED ON MAINLINE?

\_\_\_\_\_ WM021 REPAIR/REPLACE SEWER MAIN  
\_\_\_\_\_ WM010 MANHOLE - BYPASS PUMPING  
\_\_\_\_\_ WM018 CLEAN, DRAG MAINLINE

\_\_\_\_\_ CVN01 CAVE-IN STREET/SIDEWALK SINKING  
\_\_\_\_\_ CVN02 CAVE-IN SEWER MAIN BREAK/COLLAPSE  
\_\_\_\_\_ MLBO MAIN LINE BREAKDOWN / OUTFALL  
\_\_\_\_\_ MLBT MAIN LINE BREAKDOWN / TRUNKLINE  
\_\_\_\_\_ PM02 SCHEDULED PREVENTATIVE MAINTENANCE

CHECK SERVICE LATERAL BY DOING ONE OF THE FOLLOWING:

WAS PROBLEM IN SERVICE LATERAL? Y N

\_\_\_\_\_ WM018 CLEAN, SERVICE LATERAL-MECH ROD  
\_\_\_\_\_ WM010 CLEAN, SERVICE LATERAL-JET ROD

\_\_\_\_\_ STP01 STOPPAGE-GREASE IN LINE  
\_\_\_\_\_ STP02 STOPPAGE-ROOTS IN LINE  
\_\_\_\_\_ STP03 STOPPAGE-COLLAPSED LINE  
\_\_\_\_\_ STP04 STOPPAGE-OBSTRUCTION/DEBRIS  
\_\_\_\_\_ STP05 STOPPAGE-OTHER CAUSES (USE COMMENTS)  
\_\_\_\_\_ PM01 UNSCHEDULED PREVENTATIVE MAINTENANCE

Distance to stoppage \_\_\_\_\_ Linear Feet  
LINEAR FEET CLEANED \_\_\_\_\_

If no problem is found in Lateral after cleaning, check PM01 →

\*Describe inspection process in comments:

IS WORK REQUIRED ON LATERAL? Y N

WHY IS WORK NEEDED ON LATERAL?

\_\_\_\_\_ WM022 REPAIR, SERVICE LATERAL  
\_\_\_\_\_ WC003 INSTALL, SERVICE LATERAL  
\_\_\_\_\_ WC011 INSTALL, CLEANOUT  
\_\_\_\_\_ WC007 REPAIR, SEWER SERVICE TAP-RESIDENTIAL  
\_\_\_\_\_ WC008 REPAIR, SEWER SERVICE TAP-BUSINESS  
\_\_\_\_\_ WC004 INSTALL, RESIDENTIAL SEWER TAP  
\_\_\_\_\_ WC005 INSTALL, BUSINESS SEWER TAP

\_\_\_\_\_ SSLB SEWER SERVICE LATERAL BREAKDOWN  
\_\_\_\_\_ SSLR SEWER SERVICE LATERAL REQUEST  
\_\_\_\_\_ CLNO CLEANOUT NEEDED  
\_\_\_\_\_ TAPR TAP, REPAIR  
\_\_\_\_\_ TAPP TAP, PERMIT  
\_\_\_\_\_ PM02 SCHEDULED PREVENTATIVE MAINTENANCE

Sewage Spill Data

Gallons per minute \_\_\_\_\_ Confirm Time \_\_\_\_\_  
Estimated total \_\_\_\_\_ Contained Time \_\_\_\_\_  
Spill reach water body? \_\_\_\_\_

Stoppage Data

Distance to stoppage \_\_\_\_\_ Linear Feet  
If caused by roots, is tree in the City's ROW Y N

Water Body name \_\_\_\_\_

Weather conditions: Before: ☐ ☐ ☐ ☐ ☐

After: ☐ ☐ ☐ ☐ ☐

1 2 3 4 5 See back for codes

Dig up required? Y N

Pipe Size \_\_\_\_\_ Linear Feet \_\_\_\_\_

Pipe Type \_\_\_\_\_ Depth \_\_\_\_\_

Is job complete? Y N

If not complete, describe requirements needed for completion.

Is additional work required by:

Maintenance? Y N

Construction? Y N

Reconnaissance? Y N

Streets? Y N

\_\_\_\_\_ Inspection - Describe findings in comments  
\_\_\_\_\_ Non City related problem

NOTE: If pipe depth is 8 ft or less, issue Maintenance digup WO to effect repair, otherwise issue WO for Construction Digup. Check additional requirements on back of form if necessary.

Over for additional jobs? Y N

LABOR

HRS ONSITE

EMPLOYEE NAME or ID#

HRS EQUIPMENT # / VEHICLE #

ML	SL	OTHER	A
			**

\*Crew Supervisor

\*\* Equip Operator

ASSIST CREW


Travel Time \_\_\_\_\_ Start Time \_\_\_\_\_ End Time \_\_\_\_\_

QUAN PARTS/MATERIAL


Break  
Lunch

Start	End

Safety Equipment  
Check List

Vest \_\_\_\_\_  
Traffic cones and flags \_\_\_\_\_  
Men working signs \_\_\_\_\_  
Hardhats \_\_\_\_\_  
Steel toed boots \_\_\_\_\_  
Gloves \_\_\_\_\_  
Leather/cloth and  
impervious \_\_\_\_\_  
Tyvec coveralls \_\_\_\_\_  
Half mask disposable  
respirators \_\_\_\_\_  
Eye protection \_\_\_\_\_  
Ear plugs \_\_\_\_\_  
Flashlights \_\_\_\_\_  
Life vests \_\_\_\_\_  
Safety harness and  
ropes \_\_\_\_\_  
Disinfectants \_\_\_\_\_  
Eye wash \_\_\_\_\_  
Fire extinguisher \_\_\_\_\_  
First aid kit \_\_\_\_\_



**Public Works Department  
Sewer Maintenance and Construction  
Work Return Form**

*If another Work Order is needed on this job -Check below. Be sure to indicate on reverse side that additional work orders are needed*

<input type="checkbox"/> WM001 REMOVE BLOCKAGE, CATCH BASIN	<input type="checkbox"/> BLK02 BLOCKAGE-DEBRIS IN CATCH BASIN
<input type="checkbox"/> WM002 REMOVE BLOCKAGE, GRATES	<input type="checkbox"/> BLK03 BLOCKAGE-DEBRIS IN CREEK/STREA
<input type="checkbox"/> WM003 REMOVE BLOCKAGE, CREEK	<input type="checkbox"/> BLK04 BLOCKAGE-DEBRIS ON GRATE
<input type="checkbox"/> WM004 CLEAN, CATCH BASIN VACTOR	<input type="checkbox"/> BRKCB BROKEN CATCH BASIN
<input type="checkbox"/> WM005 CATCH BASIN REPAIR, MINOR	<input type="checkbox"/> BLK04 BLOCKAGE, DROP INLET
<input type="checkbox"/> WM006 CATCH BASIN REPAIR, CURB PIECE	
<input type="checkbox"/> WM007 CATCH BASIN REPAIR, MAJOR	# Grates cleaned _____
<input type="checkbox"/> WM008 CATCH BASIN, TRENCHOUT	# Catch Basins cleaned _____
<input type="checkbox"/> WM009 CLEAN, FLUSH CB	# Feet cleaned _____
<input type="checkbox"/> WM010 CLEAN, ROD CB CONNECTION	

<input type="checkbox"/> WM006 MANHOLE - REPAIR (MINOR)	<input type="checkbox"/> MH03 MANHOLE DAMAGED
<input type="checkbox"/> WM007 MANHOLE - CLEAN	<input type="checkbox"/> MH04 MANHOLE REQUIRED
<input type="checkbox"/> WM008 MANHOLE - REPLACE CASTING	<input type="checkbox"/> MH05 MANHOLE, LID MISSING/OFF.
<input type="checkbox"/> WM009 MANHOLE, REPAIR (MAJOR)	<input type="checkbox"/> MH06 MANHOLE, LOW/HIGH
<input type="checkbox"/> WM010 MANHOLE, CONSTRUCT	<input type="checkbox"/> WM011 CLEAN, DRAG SEWER
<input type="checkbox"/> WC012 MANHOLE, REPLACE LID/RESET LID	
<input type="checkbox"/> WC013 MANHOLE, RAISE LID	
<input type="checkbox"/> WC014 MANHOLE, LOWER LID	

<input type="checkbox"/> WCCTV1 LOCATE SEWER SERVICE LINE	<input type="checkbox"/> INS01 UNKNOWN BLOCKAGE
<input type="checkbox"/> WCCTV2 SEWER MAIN, TV INSPECTION	<input type="checkbox"/> INS02 INSPECTION, VISUAL
<input type="checkbox"/> WCCTV3 SEWER MAIN, SMOKE TESTING	<input type="checkbox"/> INS03 LOCATE
<input type="checkbox"/> WCCTV4 SEWER MAIN, DYE TEST	
<input type="checkbox"/> WCCTV5 SEWER MAIN, VISUAL INSPECTION	
<input type="checkbox"/> WCCTV6 LOCATE, SEWER MAIN LINE	
<input type="checkbox"/> WCCTV7 LOCATE, SEWER MAIN OUTFALL	
<input type="checkbox"/> WCCTV8 LOCATE, SEWER TRUNK LINE	
<input type="checkbox"/> WCTV09 LOCATE, MANHOLE	
<input type="checkbox"/> WCTV10 LOCATE, SERVICE CONNECTION	
<input type="checkbox"/> WCTV11 LOCATE, STORM LINE	
<input type="checkbox"/> WCTV12 TV INSPECTION, SEWER OUTFALL	
<input type="checkbox"/> WCTV13 TV INSPECTION, SEWER SERVICE LINE	
<input type="checkbox"/> WCTV14 TV INSPECTION, TRUNK SEWER	
<input type="checkbox"/> WCTV15 TV INSPECTION, STORM LINE	
<input type="checkbox"/> WCTV17 INSPECTION, VISUAL, STORM SEWER	
<input type="checkbox"/> WCTV18 STORM SEWER DYE TESTING	
<input type="checkbox"/> WCTV19 RESEARCH SEWER INFORMATION	

**Weather Codes**

W1 Dry  
W2 Heavy Rain  
W3 Light Rain  
W4 Thunder Stm  
W5 Showers

<input type="checkbox"/> WCD01 INSTALL, GABION BANK PROTECTION	<input type="checkbox"/> STBE STREAM BANK EROSION
<input type="checkbox"/> WMR14 CLEAN, FLUSH CREEK	<input type="checkbox"/> CVM03 CAVEIN, STORM LINE
<input type="checkbox"/> WM013 CLEAN, DISINFECT - SANITIZE LINE/AREA	<input type="checkbox"/> OTHER OTHER
<input type="checkbox"/> WCD04 CONSTRUCT TUNNEL	
<input type="checkbox"/> WCD10 REPAIR/REPLACE, STORM LINE	

Downtime - From: \_\_\_\_\_ To: \_\_\_\_\_ Reason: \_\_\_\_\_

Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

CREW SUPERVISOR'S SIGNATURE \_\_\_\_\_

AREA SUPERVISOR'S SIGNATURE \_\_\_\_\_

SEWER SERVICES SPECIALIST'S SIGNATURE \_\_\_\_\_

**Atlanta Watershed Collections**

68 Mitchell St SW  
Atlanta, GA 30334  
(404)330-6240

**COMPLETED Sewer Manhole Work Order****Report Date** 03/10/2006 08:04 AM**Submitted By**

Page 1

**Work Order #** 420946 **Activity** WM007A **CLEAN MANHOLE****Manhole ID** 23230107401  
**Address** 2851 DIANA DR SW  
ATLANTA GA 30315-**Qualifier**  
**Area**  
**Sub-area** BINC **District**  
**Map #** BASIN-INTRENCHMENT CREEK **Location**

<b>Manhole Type</b>		<b>Frame Type</b>	
<b>Channel Material</b>		<b>Ring Material</b>	
<b>Base Material</b>		<b>Cone Material</b>	
<b>Steps Material</b>		<b>Wall Material</b>	
<b>Surface Cover</b>		<b>Bench Material</b>	
<b>Cover Type</b>		<b>Cover Diameter</b> 0.00	<b>Metered</b> No
<b>Depth</b> 0.00		<b>Barrel Diameter</b> 0.00	<b>Drop MH</b> No
<b>Dist To Hydrant</b> 0.00		<b>Parcel</b>	
<b>Service Status</b>		<b>As Built</b>	
<b>X Coord</b> 2221991.49921		<b>Date Installed</b>	
<b>Y Coord</b> 1337669.24843		<b>Ownership</b>	
<b>Z Coord</b>		<b>Budget #</b>	

<b>Initiated By</b> W323	DAA'YAH	MUHAMMED	<b>Initiated Date</b> 04/25/2002	<b>Scheduled</b> 05/01/2002 08:00
<b>Assigned To</b> W146	ALLEN	MOORE	<b>Service #</b> 155943	<b>Due</b>

<b>Authorization</b>			
<b>Budget #</b>			
<b>Crew</b> WC028	PIPE CREW, UNIT 28		
<b>Maint Type</b> SA	SCHEDULED ASSIGNMENT		
<b>Priority</b> 1B	SCHEDULE COMPL WITHIN 24 HRS		
<b>Problem</b> STP04	OBSTRUCTION/DEBRIS		
<b>Project</b>		<b>Out of Service</b>	<input type="checkbox"/>
<b>Source</b> I	INSPECTION GENERATED	<b>Potential Service Request</b>	<input type="checkbox"/>
<b>Last Activity</b> WM007A	CLEAN MANHOLE	<b>Last Activity Completed</b>	07/29/2002

3/10/2006

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Figure 1d  
Emergency Response Plan (ERP)

**Atlanta Watershed Collections**

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Atlanta, GA 30334  
(404)330-6240

**COMPLETED Sewer Manhole Work Order****Report Date** 03/10/2006 08:04 AM**Submitted By**

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<b>Work Order #</b>	420946	<b>Activity</b>	WM007A	CLEAN MANHOLE
---------------------	--------	-----------------	--------	---------------

**Work Order Comments**

NEED CREW TO UNSTOP OUT FALL SEWER. SEWAGE COMING OUT M/H GETING INTO SOUTH RIVER CREEK,,,,DEM

TURNED OVER TO CONSTRUCTION FOR REPAIR OF MAIN LINE.

4/30/2002

UNIT 28 CREW WENT TO SITE AND STARTED EXPEDITEING EQUIPMENT TO JOB SITE AND GETTING ROAD READY FOR THEM TO START RELAYING THE PIPE.

JC.

5/1/2002

CREW STARTED TO BUILD ROAD IN ON THE INTERSTATE SIDE OF JOB SITE DOT SHUT US DOWN TILL PERMIT COULD BE OBTAINED. WENT ON STEVE DR SIDE AND STARTED TO BRING ROAD IN FROM THAT SIDE.

JC.

5/2/2002

CREW CONTINUED TO BUILD ROAD INTO JOB SITE TO BE ABLE TO INSTALL PUMP AROUND AND START LAYING NEW LINE.

JC.

5/3/2002

CREW STILL BUILDING ROAD INTO JOB SITE.

JC.

5/5/2002

CREW HAD TO REPAIR ROAD CROSSING THAT WAS WASHED OUT WHEN HEAVY RAIN CAME. AND TO CONTINUE TO BUILD ROAD.

JC.

5/6/2002

CREW CONTINUED TO BUILD ROAD AND SET UP PUMP AROUND.

5/7/2002

JC.

CREW CONTINUED TO BUILD ROAD.

JC.

5/8/2002 CREW WENT OUT AND SET UP PUMP AROUND AND DUG OUT AND LAYED ONE JOINT OF 10 INCH DUCTILE PIPE BACK FILLED AND TAMPED JC.

5/30/2002

CREW WAS DELAYED WAITING ON EQUIPMENT DUG OUT AND LAYED ONEJOINT OF 10 INCH DUCTILE PIPE BACK FILLED.JC.

5/31/2002 CREW STARTED DIGGING OUT TO LAY OTHER PIPE WHEN THE EXCAVATER BLEW A HOSE WAITTING ON MOTOR TRANSPORT TO COME OUT TO SITE TO REPAIR. JC.

6/04/2002 crew went to site and waited for machanic TO COME AND INSTALL THE HOSE AND PUT IN FULD BACK FILLED AND SAFED UP JOB JC.

6/05/2002 CREW DUG OUT AND INSTALLED BED FOR 10INCH DUCTILE PIPE TWO WAS LAYED TODAY JC.

6/6 /2002 THEY DUG DOWN 10 FOOT BED UP DITCH LINE LAID THREE JOINTS OF TEN INCH DUCTILE PIPE JC.

6/07/2002 CREW DUG DOWN AND LAID TWO JOINTS OF DUCTILE TEN INCH PIPE AND BACK FILLED JC.

6/10/2002 CREW DUG OUT AND LAID TWO JOINTS OF DUCTILE 10 INCH PIPE AND BACK FILLED JC.

6/11/2002 CREW DUG OUT AND LAID ONE JOINT OF DUCTILE 10 INCH PIPE TODY BECAUSE OF A HOSE THAT BROKE WAS SHUT DOWN TWO HOURS FOR REPAIR JC.

6/12/2002 CREW CONTINUED TO BUILD ROAD TO GET MATERIAL IN AND TO HAUL IN STONE FOR BEDDING FOR PIPE MACHINE STILL STILL DOWN FOR REPAIR. JC.

6/13/2002 CREW CONTINUED TO BUILD ROAD WHILE WAITTING ON HOSE FOR EXCAVATOR. JC.

6/14/2002 CREW CONTINUED TO BUILD ROAD AT SITE MECHANIC BROUGHT HOSE AT TWO THRITY IN THE AFTERNOON.JC.

7/17/2002 JOHN DUG OUT AND BEDDED UP AND LAID THREE JOINTS OF DUCTILE 10 INCH PIPE AND BACK FILLED. JC.

3/18/2002 CREW POURED 8 YARDS OF CONCRETE FOR THE BOTTOM OF MANHOLE AND LAID 36 FOOT OF DUCTILE LINE 10 INCH BACK FILLED AND SAFED UP JOB JC.

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68 Mitchell St SW  
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**COMPLETED Sewer Manhole Work Order****Report Date** 03/10/2006 08:04 AM**Submitted By**

Page 3

6/19/2002 CREW HELPED WITH THE BUILDING OF THE MANHOLE AND LAYED NINETY FEET OF 10 INCH DUCTILE LINE PIPE AND BACK FILLED DITCH LINE. JC.

6/20/2002 CREW DUG OUT AND LAID NINETY FOOT OF 10 INCH DUCTILE LINE PIPE AND BACK FILLED JC.

06/19/02- UNIT 131 BUILT FOUNDATION IN PREPARATION FOR PRE-CAST MANHOLE SECTIONS. GAMCK

06/20/02 UNIT 131 SET TWO 3'RISERS ,ONE 2'PRE-CAST CONE AND ONE MANHOLE CASTING AND LID. JOB IS COMPLETED GAMCK

6/21/2002 CREW LAID THREE JOINTS OF 10 INCH DUCTILE LINE PIPE AND TIED INTO THE OLD MANHOLE BACK FILLED AND LAND SCAPED AREA. JC.

06/24/2002 CREW DUG OUT AND LAID THIRTY SIX FOOT OF DUCTILE LINE PIPE AND BACK FILLED WAS DOWN WAITING ON PIPE TO BE DELIVERD TO JOB SITE FOR ABOUT TWO HOURS. JC.

06/25/2002 CREW DUG OUT AND LAID 90 FOOT OF 10 INCH DUCTILE LINE PIPE AND BACK FILLED RAIN CAME IN AND WE LOST ONE AND HALF HOURS. JC.

06/26/2002 CREW WENT TO JOB SITE AND DUG OUT FOR ONE 10 INCH DUCTILE LINE PIPE AND LIAD IT AND BACK FILLED HEAVEY RAIN CAME AND HAD A DELAY TILL AFTER LUNCH PULLED CATCG BASINS IN AREA AND HELPED 96 PUT UP TRAFIC LIGHTS ON HIS JOB. JC.

06/27/2002WENT TO JOB SITE AND DUG OUT AND LAID 90 FOOT OF 10 INCH DUCTILE LINE PIPE AND BACK FILLED. JC.....06/28/02 CONTIUNEING TO LAID MAIN LINE TO MANHOLE,LAID 72FT.OF D/I PIPE TIEING INTO MANHOLE, BACKFILL AREA UP TO M/H J.G.

07/1/02 TWO LOCATION,(1) LOCATION POURED SREVICE LATERAL CUT, STREET AREA, (2) STARTED DISASSEMBLE BYPASS (PUMP) CLEANING UP AROUND AREA ROLLING BYPASS HOLES UP TO BRING TO YARD (800FT)..JG BLOCKAGE HAS BEEN REMOVED, PIPE SEGMENT HAS BEEN RESTORED. NEED TO RESTORE AND LANDSCAPE AREA. EXPECT RESORATION TO BE COMPLETE BY BEGINING OF AUGUST. A. MOORE

07/11/2002 CREW STARTED LANDSCAPING AREA PUT OUT TWO BAGS OF GRASS SEED AND COVERED IT WITH HAY AND STRAW. JC.

07/15/2002 CREW WENT TO JOB SITE AND LANDSCAPED THE AREA AND ALSO PUT A PIER UNDER EIGHTINCH PIPE THAT WAS OFF GRADE GOING A CROSS THE CREEK AT THE END OF STEVE DRIVE. JC.

07/16/2002 CREW CONTINUED TO LANDSCAPE AREA AND TAKE DOWN PUMP AROUND HOSE. JC.

07/17/2002 CREW CONTINUED TO LAND SCAPE AREA. JC

07/18/2002 CREW CONTINUED TO LANDSCAPE AREA JC.

07/19/2002 CREW CONTINUED TO LANDSCAPE AREA JC.

07/22/2002 CREW CONTINUED TO LANDSCAPE AREA AND HELPED BRICKMASON RAISE MANHOLE.JC

07/23/2002 CREW CONTINUED TO LAND SCAPE AREA HAD ONE EXCAVATOR SENT TO SHOP AND HAULED OFF CASE LOADER ALSO SATBALIZED BANK IN CREEK JC.

0722/02 UNIT 129 RAISED MANHOLE 3' , JOB COMPLETED. GAMCK

07/24/2002 UNIT 28 REMOVED CREEK CROSSING AND CONTINUED TO LAND SCAPE AREA. JC.

07/25/2002 CREW CONTINUED TO LANDSCAPE AREA. JC

07/26/2002 CREW CONTINUED TO LANDSCAPE AREA. JC

07/29/2002 CREW WENT TO JOB SITE AND COMPLETED JOB JC.

**Logs**

Log Type	Description	Log Date	To	Entered By	Comments
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There are no logs for this work order

# **APPENDIX M**

## **CITY OF ATLANTA GREENWAY ACQUISITION PROJECT**

### **STANDARD OPERATING PROCEDURES FOR THE DESIGN, CONSTRUCTION, AND LAND RESTORATION OF NEW UTILITIES WITHIN THE GREENWAY SYSTEM**

**Prepared By:**



**USInfrastructure, Inc.**

**1000 Mansell Exchange West, Suite 220  
Alpharetta, GA 30022**

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## **1.0 INTRODUCTION**

The following Standard Operating Procedures (SOPs) shall guide entities proposing to construct sewers and/or other utilities within the Greenway System. The purpose of these SOPs is to ensure that the design and construction of sewers and/or other utilities is consistent with the requirements of the Consent Decree and the Greenway Acquisition Plan.

This document presents SOPs for the following activities:

- A. Design and construction alternatives analysis process.
- B. Greenway System Encroachment permit.
- C. Design of new utilities.
- D. Construction of new utilities.
- E. Restoration of Greenway Properties disturbed during construction of new utilities.
- F. Training of personnel involved in construction of new utilities within the Greenway System.

These SOPs are designed to minimize erosion and sedimentation within Greenway Properties by:

- A. Focusing on design options that seek to prevent or minimize erosion and sedimentation.
- B. Minimizing the quantity and duration of soil exposure during construction of utilities.
- C. Protecting critical areas during construction by reducing the velocity of and/or redirecting runoff.
- D. Installing and maintaining erosion and sediment control measures during construction.
- E. Restoring disturbed properties by establishing vegetation immediately following completion of construction.
- F. Inspecting the utility rights-of-way and maintaining erosion and sediment control measures as necessary until disturbed properties are restored.

These SOPs do not replace existing utility-specific guidelines for design and construction of new utilities, or restoration of utility rights-of-way after construction, but do establish



minimum requirements for such activities on Greenway Properties. These SOPs do not limit the City, or other responsible local government or agency, from imposing additional or more stringent requirements to control erosion and/or sedimentation.

As stated in Section VIII.D.2.m of the Consent Decree, “Any infrastructure for human activity within the Greenway Properties shall be designed and constructed with prevention of non-point source pollution as the primary consideration”. This does not mean that prevention of non-point source pollution is the sole consideration. This means that cost or other factors will not outweigh non-point source pollution prevention as the primary concern. Only safety design consideration shall be as important as non-point source pollution prevention.

## **2.0 DESIGN AND CONSTRUCTION ALTERNATIVES ANALYSIS PROCESS**

All entities proposing to construct sewers and/or other utilities that infringe on the Greenway System must evaluate the following alternatives before any construction can begin. The evaluation of alternatives should demonstrate to the City, and other responsible local government or agency, that there is no feasible alternative to placing the utility in the Greenway System and that the requirements of the Consent Decree are met. Impacts to the Greenway System must be minimized to the maximum extent. The analysis shall include consideration of alternative routes, tunneling, and force mains (for sanitary sewers). The analysis shall also consider the sensitivity of the property being impacted such as, presence of wetlands, significant habitats, and Greenway acquisition priority.

The following alternatives are listed in order of priority:

1. Construction outside the Greenway System.
2. Tunneling under the Greenway System.
1. Construction in the Outer Zone (100'-greenway boundary) of the Greenway System.
4. Construction in the Middle Zone (50'-100') of the Greenway System.
5. Construction in the Inner Zone (0'-50') of the Greenway System.
6. Construction in the Stream Bed.

The alternative analysis process must implement the Consent Decree provision that the project will be designed with the prevention of non-point source pollution as the primary consideration. This does not mean that prevention of non-point source pollution is the sole consideration. This means that cost or other factors will not outweigh pollution prevention as the primary concern. Only safety design consideration shall be as important as non-point source pollution prevention. If sewers and/or other utilities must be

constructed within the Greenway System, approval must be given by the City and other responsible local government or agency.

If, after the design and construction alternatives have been evaluated, it is determined that there is no feasible alternative to constructing the utility within the Greenway System, an encroachment permit shall be submitted to the City and other responsible local government or agency for review.

### **3.0 GREENWAY SYSTEM ENCROACHMENT PERMIT**

In order to receive approval to construct utilities within the Greenway System, an “Encroachment” permit must be submitted to the City and other responsible local government or agency. The encroachment permit must be approved by the City with recommendations from other responsible local government or agency before any construction can begin. The permit application shall contain the information listed below:

- A. Name, address, and telephone number of the applicant.
- B. A description of the project and project location including stream segment, section, range, and township.
- C. A description of the methods which will be used for erosion and sediment control on the site.
- D. A description, including plans and specifications, of how the site will be restored after construction is completed.
- E. A description of how stormwater will be handled.
- F. A schedule of regular inspections and repair of erosion and sediment control structures.
- G. The Encroachment Permit must include a Land-Disturbing Activity Plan. This plan shall include a brief narrative description of the overall project, detailed maps, drawings and sketches, activity schedule for each phase of land-disturbing activity and supportive data. The Land-Disturbing Activity Plan must also describe the best management practices (BMPs) for erosion and sediment control for the project and demonstrate that the BMPs meet the minimum requirements of this section and the latest edition of the Manual for Erosion and Sediment Control in Georgia, and will be effective for the specific stream corridor conditions of the project. In addition, the Land-Disturbing Activity Plan must include the following:
  - 1. Required construction start and completion dates to minimize construction during the rainy season.

2. A plan for inspections to ensure BMPs are properly maintained and are effective throughout the project.
3. Installation techniques for BMPs such as silt fence, and requirements to remove any BMPs from the stream or Greenway properties that remain after project completion.

For complete requirements of a Land-Disturbing Activity Plan see the latest edition of the Manual for Erosion and Sediment Control in Georgia.

As part of the Encroachment Permit application process, the applicant must agree to notify the City and other responsible local government or agency before construction begins inside the Greenway System, so City and other responsible local government or agency can inspect the construction site to ensure that adequate erosion and sediment control measures are in place prior to construction and maintained until the project is completed and the site restored.

#### **4.0 DESIGN OF NEW UTILITIES**

The entity proposing to construct a new utility within the Greenway System shall be responsible for the design and preparation of construction contract documents (plans and specifications). All utilities shall be designed with prevention of non-point source pollution as the primary consideration. The construction contract documents shall include drawings and specifications describing erosion and sediment controls that shall be used during construction including best management practices (BMPs) to be implemented. BMPs shall meet the minimum requirements established in this document.

#### **5.0 CONSTRUCTION OF NEW UTILITIES**

##### **5.1 PERMITS, VARIANCES, AND PLANS**

It is the responsibility of the entity proposing to construct new utilities within the Greenway System to determine what permits, plans, or variances are required for construction activities. For example, the State of Georgia may have requirements under their General Storm Water Permit Program or Fulton County may require a Stream Buffer Variance and a Land Disturbance Activity Permit. Requirements may vary from one jurisdiction to another. Therefore, it is imperative that the entity proposing to construct new utilities has a clear understanding of local requirements.

##### **5.1.1 State of Georgia General Storm Water Permitting**

At the time of the writing of this document, construction projects that are five (5) acres or larger in size require coverage under the State of Georgia NPDES, General Permit GAR100000, for authorization to discharge storm water associated with construction activities. One of the construction activities this permit authorizes is the discharge of storm water associated with construction activities from linear construction that will

result in the disturbance of more than five (5) acres. As stated in the permit “‘Linear Construction’ or ‘Linear Construction Project’ means construction activities that are not part of a common development and where the length of the project is at least 25 times longer than the width of the project and the construction activity is being conducted by the Georgia Department of Transportation, by a local government, or by a utility company or utility contractor”. It is the responsibility of entity proposing to construct a new utility within the Greenway System to determine if they need to apply for coverage. Application is made by submittal of a Notice of Intent (NOI) and a permit fee to:

Northwest Georgia Regional Office  
Georgia Environmental Protection Division  
Suite 114  
4220 International Parkway, Suite 101  
Atlanta, GA 30354  
Telephone (404) 675-6240

The NPDES general construction permit requires the use of Best Management Practices (BMPs) to control stormwater runoff for all rainfall events up to and including a 25-year 24-hour rainfall event. BMPs used shall be consistent with, and no less stringent than, those practices contained in the Manual for Erosion and Sediment Control in Georgia published by the State Soil and Water Conservation Commission as of January 1 of the year in which the land-disturbing activity is permitted. For some sites, additional BMPs beyond those identified in the Manual may be necessary for erosion and sediment control for all rainfall events up to, and including, a 25-year 24-hour rainfall events.

To ensure compliance with State water quality standards, the general permit requires inspections of the construction site as well as sampling and analysis of stormwater runoff from the site. The permit also requires daily recording of on-site precipitation. Detailed requirements for inspection and sampling are provided in the general permit. The guidelines set forth in this document and the latest edition of the Manual for Erosion and Sediment Control in Georgia will be used in conjunction with the State general permit to ensure that the best possible procedures are used for erosion and sediment control.

### **5.1.2 Stream Buffer Variance**

The State of Georgia Environmental Protection Division (EPD) enforces minimum stream buffer requirements. At the time of the writing of this document the EPD's requirements prohibit construction activities within a 25-foot buffer along the banks of all state waters or within a 50-foot buffer along the banks of any state waters classified as 'trout streams' (the State of Georgia Department of Natural Resources maintains the most current stream classifications). The Director of the EPD may grant a variance that is at least as protective of natural resources and the environment as provisions described in Title 12-7-6 of the Official Code of Georgia Annotated. The Director of the EPD may also grant a variance where a drainage structure or a roadway drainage structure must be constructed, provided that adequate erosion and sediment control measures are incorporated in the project plans and specifications and are implemented during

construction. The buffer distance is measured horizontally from the point where vegetation has been wrested by normal stream flow or wave action. It is the responsibility of the entity proposing to construct a new utility within the Greenway System to determine if a variance is required from the State of Georgia, the City, or other responsible local government or agency.

### **5.1.3 Land Disturbance Activity Permits (LDP)**

It is the responsibility of the entity proposing to construct a new utility within the Greenway System to determine if a Land Disturbance Activity Permit is required from any authority having jurisdiction. A Land Disturbance Activity Permit may contain the following information:

- A. Name, address, and contact telephone number.
- B. Narrative description of the maintenance activities to be conducted.
- C. Description of BMPs to be used.
- D. A site map.
- E. An activity schedule.
- F. Supportive data.
- G. A plan and specifications for restoring the site to a natural state with permanent vegetation.

The entity proposing to construct a new utility within the Greenway System shall contact the City and other responsible local government or agency for specific Land Disturbance Activity Permit requirements.

## **5.2 SITE CLEARING**

The following SOPs shall be followed during the site clearing phase for construction of new utilities:

- A. All cut and fill activities occurring within the EPD's mandated 25-foot stream buffer (50-foot buffer for trout streams) shall be stabilized with appropriate erosion control matting and blankets.
- B. The area to be cleared shall be clearly delineated to ensure that no clearing occurs beyond the area identified. Except for perpendicular utility crossings, any open cut, grading, clearing, or installation of surface facilities shall be set back from the streambanks to the greatest distance feasible, with a minimum setback of fifty (50) feet. Except for manholes, portals, and the maintenance access to such

facilities, the Greenway System must remain in a natural state even where crossings are perpendicular to the stream. Where feasible utility projects are suggested to have no more than a thirty (30) foot construction width (for projects paralleling the stream) outside the fifty (50) foot buffer.

- C. Vegetation to be preserved shall be identified and clearly marked by flagging before clearing begins. Vegetation to be preserved shall include: vegetation vital to streambank stabilization; vegetation providing food and/or habitat to a federally listed endangered species, threatened species, or species of concern; vegetation that is a federally listed endangered species, threatened species, or species of concern; and vegetation that comprises a wetland ecosystem.
- D. Stemmed vegetation such as brush, shrubs, and trees shall be removed at or near the ground level, leaving the root systems intact.
- E. When pruning is necessary to clear the construction area, pruning cuts shall be made in accordance with the International Society of Arboriculture (ISA) Standards.
- F. Trees shall be felled into the cleared construction area or areas to be cleared and not onto vegetation to be preserved.
- G. Trees which have fallen into water bodies or beyond the construction area shall be removed immediately.

### **5.3 EROSION AND SEDIMENT CONTROL**

#### **5.3.1 Project Planning and Preliminary Grading**

Efforts shall be made during initial planning and whenever possible during construction phases to minimize the amount of area cleared and graded (exposed) as well as the total exposure time. Whenever feasible, preliminary grading operations shall be used to control the flow direction and velocity of runoff water and thereby dissipate energy. Where feasible, swales and diversion berms shall be used to direct runoff water to locations where treatment by sediment barriers can be performed. Where feasible, transverse diversion berms, installed perpendicular to the flow of water down slopes and in drainage channels, shall be used to reduce runoff water velocity. Cleared slopes shall be harrowed with construction equipment to create small diversion channels along the contours of the slope perpendicular to the direction of runoff flow. This action not only reduces flow velocities of runoff water traveling down the slopes, but also reduces flow quantities by increasing the area of exposed soil and thus enhancing percolation of runoff water.

Whenever feasible, small depressions shall be created in appropriate locations during site grading. Graded depressions can reduce flow velocities and can also provide clarification by allowing suspended particles to settle out. They also provide temporary storage of

runoff water, thereby reducing the rate at which water is discharged downgradient. Grading equipment shall cross flowing streams by the means of bridges or culverts, except when such methods are not feasible, provided in any case that such crossings shall be kept to a minimum.

Dust from the disturbed area shall be controlled. Temporary means for controlling dust shall include mulching or vegetative cover with temporary seeding (see the latest edition of the Manual for Erosion and Sediment Control in Georgia). Emergency means for controlling dust shall include tillage or irrigation.

### **5.3.2 Erosion and Sediment Control Practices**

Erosion and Sediment Control Practices must be implemented prior to any land disturbing activities within the Greenway System. Control of factors affecting erosion and sediment can be provided by a number of basic practices. The establishment of a dense strand of vegetation is probably the most effective means of controlling erosion and sediment; however, this control measure is often not practical until the completion of a project. Revegetation can require a substantial amount of time. Prior to and during the construction of utilities within the Greenway System, temporary erosion and sediment control measures shall be implemented and maintained until the construction area is restored as described later in this document.

Soft engineering techniques shall be used for erosion and sediment control. Hard engineering techniques shall only be used after soft techniques have failed and the failure is due to the inability of soft techniques to address the erosion problem. Improper choice of soft engineering techniques or improper design, implementation, and/or maintenance shall not be justification to turn to hard engineering techniques.

Article 8.0 of this appendix presents summaries of techniques, (including their applications) used to control erosion and sedimentation during the construction of utilities within the Greenway System. Erosion and sediment control measures shall be designed and implemented in accordance with the design standards established Article 8.0 and the latest edition of the Manual for Erosion and Sediment Control in Georgia. If a conflict occurs between the design and construction standards presented in Article 8.0 and those presented in the latest edition of the Manual for Erosion and Sediment Control in Georgia, the more stringent design and construction standards shall prevail. The selection of the most appropriate erosion and sediment control measure will be made by the entity proposing to construct a new utility within the Greenway System based on site specific conditions.

## **5.4 CONSTRUCTION METHODS**

After all appropriate erosion and sediment control measures have been installed, the designated construction work can proceed as approved by the City with recommendations from any other responsible local government or agency. All clearing work and construction operations shall be conducted in such a manner as to effectively control soil erosion and prevent non-point source pollution loads from entering streams, ponds,

and/or wetlands. At any time during the construction project, the City with recommendations from any other responsible local government or agency has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow, and fill operations and to direct the entity proposing to construct a new utility within the Greenway System to provide immediate permanent or temporary erosion and sediment control measures to prevent contamination of wetlands or water courses on the Greenway property.

Prohibited construction procedures include, but are not limited to, the following:

- A. Dumping of spoil material into any streams, wetlands, surface waters, or unspecified locations.
- B. Indiscriminate, arbitrary, or capricious operation of equipment in wetlands or surface waters. During the design of sewers and/or other utilities likely to go through existing wetlands, the City, with recommendations from other responsible local government or agency, will explore other alternatives such as construction outside the wetland and/or tunneling. If other methods are feasible, the City or other utility provider will design and construct the sewer and/or other utilities using the method that avoids construction through the wetland.
- C. Pumping of silt-laden water from trenches or excavations into surface waters or wetlands.
- D. Damaging vegetation adjacent to or outside of the construction area limits.
- E. Disposal of trees, brush, debris, plants, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in wetlands, surface waters, or unspecified locations.
- F. Alteration of the flow line of any stream, unless such work is of a temporary nature, has been specifically authorized, and is necessary to divert flow from excavation work so that debris and sediments are not released into streams. Various design and construction alternatives shall be investigated and the cost effective alternative that minimizes the deposition of debris, habitat degradation, and sediments will be utilized.
- G. Open burning of debris within Greenway properties.

All conveyance channels, drainage outlets, and erosion and sediment control measures must be constructed to withstand the expected velocity of flow from a five-year frequency storm without erosion.



## **6.0 RESTORATION OF GREENWAY PROPERTIES DISTURBED DURING CONSTRUCTION OF NEW UTILITIES**

Permanent soil stabilization measures shall be applied to disturbed areas within 30 days after all soil disturbing activities have been completed and the final grade has been reached on any portion of the construction project site. Permanent soil stabilization means that for unpaved areas and areas not covered by permanent structures, at least 70 percent of the soil surface is uniformly covered in permanent vegetation or equivalent permanent stabilization measures (such as the use of riprap, gabions, permanent mulches or geotextiles) have been employed. Until these conditions are satisfied and permanent control measures and facilities are operational, interim stabilization measures and temporary erosion and sediment control measures shall not be removed. Efforts shall be made to return the site to its natural condition. Native vegetation shall be used in such efforts. Acceptable plants and grasses are listed in Section 5.0 of this document and the latest edition of the Manual for Erosion and Sediment Control in Georgia.

Temporary soil stabilization measures shall be applied immediately to disturbed areas that are not at final grade but shall remain dormant for longer than 60 days. Areas that have been stabilized by temporary measures must be permanently stabilized once all soil disturbing activities are complete and the area is at final grade. Also, permanent stabilization measures shall be applied immediately to rough graded areas that will require erosion and sediment control for longer than six months.

### **6.1 PERMANENT VEGETATION**

Permanent vegetation is the planting of perennial vegetation such as trees, shrubs, vines, grasses, or legumes, on exposed areas for permanent soil stabilization. A crop of perennial vegetation appropriate for the region, which is capable of providing a 70 percent coverage within the growing season, shall be used to achieve permanent soil stabilization.

The purpose of establishing permanent vegetation in disturbed areas is to protect the soil surface from erosion, reduce damage from sediment, reduce runoff to downstream areas, improve wildlife habitat and visual resources, and improve aesthetics. Permanent soil stabilization applies to each phase of construction. For linear construction projects on land used for agricultural or silvicultural purposes, permanent stabilization may be accomplished by stabilizing the disturbed land for its agricultural or silvicultural use. For design and construction specifications for disturbed area stabilization with permanent vegetation see Article 8.0 and the latest edition of the Manual for Erosion and Sediment Control in Georgia.

Sod shall be used to establish a permanent vegetative cover on highly erodible or severely eroded lands. Sod establishes immediate ground cover and thereby reduces runoff, erosion, and dust, which results in improved aesthetics; higher land value; stabilized waterways and critical areas; less sediments, nutrients and bugs; less downstream complaints; reduced likelihood of legal action and work stoppage due to legal action; and increased “good neighbor” benefits.

Sod is appropriate for areas that require immediate vegetative covers such as drop inlets, grass swales, and waterways with intermittent flow. Sod can initially be more costly than seed, but the advantages justify the increased initial costs.

The advantages to sod include the following:

- A. Immediate erosion and sediment control, green surface, and quick use.
- B. Reduced failure as compared to seed.
- C. Lack of weeds.
- D. Can be established almost year-round.

Sod is preferable to seed in waterways and swales because of the immediate protection of the channel after application. Sod must be staked in concentrated flow areas. For design and construction specifications for disturbed area stabilization with permanent sod see Article 8.0 and the latest edition of the Manual for Erosion and Sediment Control in Georgia.

## **6.2 EROSION CONTROL MATTING AND BLANKETS**

This stabilization technique provides a protective covering (blanket) or a soil stabilization mat to establish permanent vegetation on steep slopes, channels, or shorelines. The purpose of erosion control matting and blankets is to provide a microclimate that protects young vegetation and promotes its establishment and to reinforce the turf against forces of erosion during storm events.

Matting and blankets shall be applied on steep slopes where the hazard of erosion is high and planting is likely to be too slow in providing adequate protective cover. Concentrated flow areas, slopes steeper than 2.5:1 and with a height of ten feet or greater, and cuts and fills within the stream buffer, shall be stabilized with the appropriate erosion control matting or blanket. On streambanks where moving water is present, matting can be used to prevent new plantings from being washed away. For design and construction specifications for erosion control using matting and blankets see Article 8.0 of this section and the latest edition of the Manual for Erosion and Sediment Control in Georgia.

Benefits of using erosion control blankets include the following:

- A. Protection of seed and soil from raindrop impact and subsequent displacement.
- B. Thermal consistency and moisture retention for seedbed areas.
- C. Stronger and faster germination of grasses and legumes.
- D. Planing off excess stormwater runoff.

- E. Prevention of sloughing of topsoil added to steeper slopes.

Benefits of using erosion control matting include the following:

- A. All benefits gained from using erosion control blankets that are listed above.
- B. Collects soil out of stormwater which becomes the growth medium for the development of roots.
- C. Assists the vegetative root system in forming an erosion-resistant cover resistant to hydraulic lift and shear forces when embedded in the soil of stormwater channels.

## **7.0 TRAINING OF PERSONNEL INVOLVED IN CONSTRUCTION OF NEW UTILITIES WITHIN THE GREENWAY SYSTEM**

Key Personnel involved in construction of utilities within Greenway Properties shall be trained of the requirements of the Consent Decree, the Greenway Acquisition Plan, and these SOPs. The key personnel shall also be trained on the proper installation, implementation, and inspection of erosion and sediment control measures.

A “pre-construction” meeting shall be held between the City, other responsible local government or agency, and key personnel of the utility or construction agency following training in order to ensure that all parties have a common understanding as to how construction will be performed within the Greenway Properties.

## **8.0 TECHNIQUES FOR EROSION AND SEDIMENT CONTROL**

This section presents summaries of techniques, (including their applications) used to control erosion and sedimentation during the construction of utilities within the Greenway System. Erosion and sediment control measures shall be designed and implemented in accordance with the design standards established in this section and the latest edition of the Manual for Erosion and Sediment Control in Georgia. If a conflict occurs between the design and construction standards presented in this section and those presented in the latest edition of the Manual for Erosion and Sediment Control in Georgia, the more stringent design and construction standards shall prevail. The selection of the most appropriate erosion and sediment control measure will be made by the entity proposing to construct a new utility within the Greenway System based on site specific conditions.

### **8.1 CHECK DAM**

#### **8.1.1 Definition**

Small temporary barriers, grade control structures, or dams constructed across a swale, drainage ditch, or areas of concentrated flow.

### **8.1.2 Purpose**

To minimize erosion by reducing the velocity of storm water in areas of concentrated flow.

### **8.1.3 Conditions Where Practice Applies**

This measure is limited to use in small open channels and shall not be used in a live stream. Specific applications include:

- A. Temporary or permanent swales or ditches in need of protection during establishment of grass linings.
- B. Temporary or permanent swales or ditches which, because of their short length of service or other reason, cannot establish a non-erodible lining but still need some protection against erosion.
- C. Other locations where small localized erosion and resulting sedimentation problems exist.

### **8.1.4 Planning Consideration**

Check dams may be constructed of stone or hay bales. The drainage area for a stone check shall not exceed 2 acres. The drainage area for haybales shall not exceed one acre. Most check dams would be constructed of stone, however, stone may not be acceptable in some installations because of aesthetics and hay bales may need to be considered.

Stone checks dams (Figure M-2) are easier to install with backhoes or other suitable equipment. The stone is usually purchased. Stone shall be handled carefully in areas to be mowed. Some stone may be washed downstream and shall be removed before each mowing operation.

Check dams shall be planned to be compatible with the other features such as streets, walks, trails, sediment basins, and rights-of-way or property lines. Check dams may be constructed in series and the dams shall be located at a normal interval from other grade controls such as culverts or sediment basins.

Check dams constructed of hay bales (Figure M-3) have the shortest life of the materials discussed. The maximum design life for hay bale structures is 3 months. Haybale check dams shall not be used where permanent watercourse protection is needed.

### **8.1.5 Design Criteria for Check Dams**

Formal design is not required. The following limiting factors shall be adhered to when designing check dams.

- A.     Drainage Area:             Stone -2 acres or less  
  Haybale – 1 acre or less.
- B.     Maximum Height:        2 feet when measured to center of check dam.
- C.     Side Slopes:             2:1 or flatter.
- D.     Max. Spacing  
          Between Dams:         Elevation of toe of upstream dam is at or below  
  elevation of crest of downstream dam (see Figure M-1).
- E.     Geotextiles:             Suitable geotextiles shall be placed between the stone and  
  its soil base and abutments.

Top of dam, perpendicular to flow, shall be parabolic. The center of the dam must be at least 9 inches lower than the outer edges (see Figures M-2 and M-3).

#### **8.1.6 Construction Specifications for Check Dams**

Check dams shall be constructed to be stable throughout their planned life. The dam shall be constructed well into the abutment so that water cannot run around the dam.

- A.     Stone check dams shall be constructed of size 2-10 inch stone. Mechanical or hand placement shall be required to insure complete coverage of the entire width of ditch or swale and that the center of the dam is a minimum of 9 inches lower than the outer edges.
- B.     Haybale check dams may be used as temporary check dams in concentrated flow areas while vegetation is becoming established. Haybale check dams shall not be used where the drainage area exceeds 1 acre. The haybales shall be embedded a minimum of 4 inches on its upslope side.

#### **8.1.7 Maintenance**

Periodic inspection of check dams is necessary. Repair shall be made as soon as possible to minimize damage and expense of repair. Sediment shall be removed when it reaches a depth of one-half the original dam height.

Once areas that require mowing are at final grade and have been permanently stabilization the check dams shall be removed. Otherwise, check dams may remain in place permanently.

Whenever check dams are removed, care shall be taken to minimize disturbance to the remainder of the watercourse. The area where the check dam was removed shall be immediately shaped and smoothed to watercourse dimensions, seeded and mulched. If the area is to be mowed where stone check dams have been used, care shall be taken to remove all stone.

## **8.2 STREAM DIVERSION CHANNEL**

### **8.2.1 Definition**

Stream diversion channels are temporary channels constructed to convey flow around a construction site while a permanent structure is being constructed in the stream channel.

### **8.2.2 Purpose**

The purpose of a stream diversion channel is to protect the streambed from erosion and allow work “in the dry”.

### **8.2.3 Conditions Where Practice Applies**

Temporary stream diversion channels shall be used only on flowing streams with a contributing drainage area less than one square mile. For streams with larger contributing drainage areas, structures or methodology shall be designed by methods which more accurately define the actual hydrologic and hydraulic parameters which will affect the functioning of the structure.

### **8.2.4 Planning Consideration**

In cases where in-stream work is unavoidable, the amount of encroachment and time spent working in the channel shall be minimized. If construction in the streambed will take an extended period of time, substantial in-stream controls or stream diversion channel shall be considered to prevent excessive damage due to sedimentation. To limit land-disturbance, overland pumping of the stream shall be considered in low-flow conditions. Clearing of the streambed and banks shall be kept to a minimum. Refer to Figures M-14a and M-14b for typical stream diversion channel details.

### **8.2.5 Design Criteria for Stream Diversion Channels**

- A. Contributing drainage Area: Temporary stream diversion channels shall not be used on streams with a contributing drainage area greater than one square mile (640 acres).
- B. Size: The bottom width of the stream diversion shall be a minimum of six feet or equal to the bottom width of the existing streambed, whichever is greater.
- C. Side Slopes: Side slopes of the stream diversion channel shall be no steeper than 2:1.
- D. Depth and Grade: The depth and grade may be variable, dependent on site conditions, but shall be sufficient to ensure continuous flow of water in the diversion.

- E. Channel Lining: A stream diversion channel shall be lined to prevent erosion of the channel and sedimentation in the stream. The lining is selected based upon the expected velocity of bankfull flow. Refer to Table M-1 for selection of channel lining material and see the latest edition of the Manual for Erosion and Sediment Control in Georgia for specifications.

<b>Table M-1 Stream Diversion Channel Linings</b>		
<b>Lining Materials</b>	<b>Code</b>	<b>Acceptable Velocity Range</b>
Geotextile, polyethylene film, or sod	Dc-A	0 – 2.5 fps
Geotextile alone	Dc-B	2.5 – 9.0 fps
Class I riprap and geotextile	Dc-C	9.0 – 13.0 fps

Source: the Manual for Erosion and Sediment Control in Georgia, 2000, Georgia Soil and Water Conservation Commission.

- F. Geotextile: Geotextiles shall be used as a protective cover for soil, or if the channel is to be lined with riprap, as a separator between graded stone and the soil base. The geotextile will prevent erosion of the channel and the migration of soil particles from the subgrade into the graded stone. The geotextile shall be specified in accordance with AASHTO M288-96 Section 7.5, *Permanent Erosion Control Recommendations*. The geotextile shall be placed immediately adjacent to the subgrade without any voids.

### **8.2.6 Construction Specifications for Stream Diversion Channels**

- A. The channel shall be excavated, constructing plugs at both ends. Plugs can be constructed of compacted soil, riprap, sandbags or sheet plastic.
- B. A Silt fence or berm shall be placed along the sides of the channel to prevent unfiltered runoff from entering the stream. The berm can be constructed using the material excavated for the stream diversion.
- C. The channel surface shall be smooth (to prevent tearing of the liner) and lined with the material specified in the plans. The outer edges of the geotextile shall be secured at the top of the channel with compacted soil.
- D. The plugs shall be removed when the liner installation is complete, removing the downstream plug first.
- E. As soon as construction in the streambed is complete, diversions shall be replugged and backfilled. The liner shall be inspected for damage and salvaged if possible.

- F. Upon removal of the lining, the stream shall immediately be restored and properly stabilized.

### **8.2.7 Maintenance**

To ensure that the work area stays dry and that no construction materials float downstream, the stream diversion channel shall be inspected at the end of each day to make sure that the construction materials are positioned securely. All repairs shall be made immediately.

## **8.3 DIVERSION**

### **8.3.1 Definition**

A ridge of compacted soil, constructed above, across or below a slope.

### **8.3.2 Purpose**

To reduce the erosion of steep, or otherwise highly erodible areas by reducing slope lengths, intercepting stormwater runoff and safely diverting it to stabilized outlets at non-erosive velocities.

### **8.3.3 Conditions Where Practice Applies**

- A. Where runoff from higher areas may damage property, cause erosion, contribute to pollution, flooding, or interfere with the establishment of vegetation on lower areas.
- B. Where surface and/or shallow subsurface flow is damaging sloping upland, manmade improvements, or unstabilized areas.
- C. Where the slope length needs to be reduced to minimize soil loss.

### **8.3.4 Planning Considerations**

Diversions can be a useful tool for managing surface water flows and preventing soil erosion. On moderately sloping areas, they may be placed at intervals to trap and divert sheet flow before it has a chance to concentrate and cause rill and gully erosion.

Diversions may be placed at the top of cut or fill slopes to keep runoff from upland drainage areas off the slope. Diversions are also typically built at the base of steeper slopes to protect flatter developed areas, which cannot withstand runoff water from outside areas. They can also be used to protect structures, parking lots, adjacent properties, and other special areas from flooding.



Diversions are preferable to other types of man-made stormwater conveyance systems because they more closely simulate natural flow patterns and characteristics. Flow velocities are generally kept to a minimum. When properly coordinated into the landscape design of a site, diversions can be visually pleasing as well as functional.

As with any earthen structure, it is very important to establish adequate vegetation as soon as possible after installation. It is usually important to stabilize the drainage area above the diversion so that sediment will not enter and accumulate in the diversion channel.

### **8.3.5 Design Criteria**

- A. Location: Diversion location shall be determined by considering outlet conditions, topography, land use, soil type, length of slope, seepage (where seepage is a problem), and the development layout. Outlets must be stable after diversions empties stormwater flow into them, therefore, care shall be exercised in the location selection of the diversion and its outlet.
- B. Ridge Design: The supporting ridge cross-section shall meet the following criteria.
  - 1. The compacted ridge shall be designed to have stable side slopes, which shall be no steeper than 2:1.
  - 2. The width of the ridge at the design water elevation shall be a minimum of 4 feet.
  - 3. The minimum freeboard shall be 0.3 foot.
  - 4. The design shall include a 10 percent settlement factor.
- C. Channel Design: Diversions shall be tailored to fit the conditions of a particular site and local soil type(s). Land slope must be taken into consideration when choosing channel dimensions. Narrow and deep channels may be required on steeper slopes, while broad, shallow channels usually are more appropriate on gentle slopes. The wide, shallow section will be easier to maintain. Since sediment deposition is often a problem in diversions, the designed flow velocity shall be kept as high as the channel lining will permit.

Table M-2 shall be used to select the storm frequency required for the design of the diversion and to determine the required channel capacity, Q (peak rate of runoff).

<b>Table M-2 Diversion Design Criteria</b>				
<b>Diversion Type</b>	<b>Land or Improvement Protected</b>	<b>24-hour Storm Frequency</b>	<b>Freeboard (feet)</b>	<b>Minimum Top Width (feet)</b>
Temporary	Construction areas Building Sites	10 years <sup>1</sup>	0.3	4
Permanent	Landscaped, recreation and similar areas	25 years	0.3	4
	Dwellings, schools, commercial buildings, and similar installation	50 years	0.5	4

<sup>1</sup> Use 10 year or the storm frequency specified in Title 12 of the Official Code of Georgia Annotated.

Source: the Manual for Erosion and Sediment Control in Georgia, 2000, Georgia Soil and Water Conservation Commission.

The channel portion of the diversion shall be designed according to specifications outlined in the latest edition of the Manual for Erosion and Sediment Control in Georgia.

- D. Outlet: Each diversion shall have an adequate outlet, which will discharge concentrated runoff without erosion. The outlet may be a constructed or natural waterway, a stabilized vegetated area or a stabilized open channel. Protected outlets shall be constructed and stabilized prior to construction of the diversion.
- E. Road and Utility Rights-of-Way: Diversions installed to divert water off a road or right-of-way shall consist of a series of compacted ridges of soil running diagonally across the road at a 30° angle. Ridges are constructed by excavating a channel upstream for this type of diversion (see Figure M-5). Stable outlets shall be provided for each diversion.

A detailed design is not required for this type of diversion. The compacted ridge height shall be 8-12 inches above the original road surface; the channel depth shall be 8-12 inches below the original road surface. Channel bottoms and ridge tops shall be smooth enough to be crossed by vehicular traffic. The maximum spacing between diversions shall be as follows:

<b>Road Grade (%)</b>	<b>Distance Between Diversions (feet)</b>
1	400
2	250
5	125
10	80
15	60
20	50

### **8.3.6 Construction Specifications**

- A. All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the diversion.
- B. The diversion shall be excavated or shaped to line, grade, and cross-section as required to meet the criteria specified herein and free of irregularities which will impede normal flow.
- C. All fills shall be machine compacted as needed to prevent unequal settlement that would cause damage in the completed diversion.
- D. All earth removed and not needed in construction shall be spread or disposed of so that it will not interfere with the functioning of the diversion.
- E. Diversion channels shall be stabilized in accordance with Channel Stabilization specifications in the latest edition of the Manual for Erosion and Sediment Control in Georgia.

### **8.3.7 Maintenance**

Before the construction site is restored, the diversion shall be inspected after every rainfall. Sediment and debris shall be removed from the ditch line and repairs made as necessary. Seeded areas that fail to establish a vegetative cover shall be reseeded as necessary.

After stabilization, the diversion shall be inspected for erosion following each significant flow. Damaged areas shall be patched with compacted soil and re-vegetated to prevent further erosion. The vegetation shall be fertilized on an annual basis to keep the grass vigorous and protective. The vegetation shall be re-established whenever it does not cover the ground and does not provide protection against erosion damage.

## **8.4 TEMPORARY DOWNDRAIN STRUCTURE**

### **8.4.1 Definition**

A temporary downdrain structure is a pipe used to temporary convey a concentration of storm water down the face of cut or fill slopes without causing slope erosion.

### **8.4.2 Purpose**

The purpose of a temporary downdrain is to safely move storm runoff from one elevation to another without causing slope erosion and allowing the establishment of vegetation on the slope. Refer to Figure M-6 for typical temporary downdrain structure details.

### 8.4.3 Conditions Where Practice Applies

Temporary downdrains shall be used on slopes where concentrated storm water could cause erosion damage. Once a permanent water disposal system has been installed these structures shall be removed.

### 8.4.4 Design Criteria

Formal design shall not be required. A temporary downdrain structure shall be placed on undisturbed soil or well-compacted fill. The pipe diameter shall have sufficient capacity to convey the maximum runoff expected during the life of the drain. Refer to Table M-3 for selecting pipe sizes.

<b>Table M-3 Pipe Diameter for Temporary Downdrain Structure</b>	
<b>Maximum Drainage Area per Pipe (acre)</b>	<b>Pipe Diameter (inches)</b>
0.3	10
0.5	12
1.0	18

Source: Manual for Erosion and Sediment Control in Georgia, 2000, Georgia Soil and Water Conservation Commission.

The pipe material shall be heavy-duty, flexible material such as non-perforated, corrugated plastic pipe or specially designed flexible tubing. The pipe shall be anchored with hold-down grommets or stakes at intervals not to exceed 10 feet. The outlet of the pipe shall be securely anchored in place. The pipe shall extend beyond the toe of the slope.

Diversions shall be used to route runoff to the downdrain's Tee or "L" inlet at the top of the slope. The entrance shall be sloped ½ inch per foot toward the outlet. To prevent the pipe from being washed out by seepage or piping, the soil around the inlet shall be thoroughly compacted. A stone filter ring or check dam may be placed at the inlet for added sediment filtering capacity.

Riprap shall be placed at the outlet for energy dissipation. For additional protection at the outlet a flared end section, Tee outlet, or other suitable device shall be used in conjunction with the riprap.

### 8.4.5 Construction Specifications

Slope drains often fail due to water saturating the soil and seeping along the pipe. Firm contact between the pipe and the soil at all points will help to eliminate this type of failure. To ensure proper pipe-soil contact, back-filling around and under the pipe shall be performed with stable soil material, hand compacting in 6-inch lifts.

- A. Slope drains shall be placed on undisturbed soil or well-compacted fill as indicated on the plans.
- B. The section of pipe under the dike toward the outlet shall be slightly sloped.
- C. The soil under and around the entrance section shall be hand tamped in lifts not to exceed 6 inches.
- D. The fill over the drain at the top of the slope shall have minimum dimensions of 1.5-foot depth, 4 feet top width and 3:1 side slopes.
- E. All slope drain connections shall be watertight.
- F. All fill material shall be well-compacted and the exposed sections of the drain shall be securely fasten with grommets or stakes spaced no more than 10 feet apart.
- G. The drain shall be placed slightly diagonally across the slope and extend beyond the toe of the slope. The outlet shall be curved uphill and adequately protected from erosion.
- H. If the drain is conveying sediment-laden runoff, the flow shall be directed into a sediment trap or sediment basin.
- I. The settled, compacted dike ridge shall be no less than 1 foot above the top of the pipe at every point.
- J. All disturbed areas shall be stabilized immediately following construction.

#### **8.4.6 Maintenance**

The slope drain and supporting diversions shall be inspected after every rainfall. Any necessary repairs shall be made promptly. Once the disturbed area has been permanently stabilized the slope drains shall be removed. The slope drain material shall be disposed of properly and all disturbed areas shall be stabilized appropriately.

### **8.5 ROCK FILTER DAM**

#### **8.5.1 Definition**

A rock filter dam is a permanent or temporary stone filter dam installed across a small stream or drainageway.

#### **8.5.2 Purpose**

This structure serves as a sediment filtering device in drainageways and in some cases, it may also reduce the velocity of stormwater flow through a channel. A rock filter dam is

not intended to substantially impound water. All appropriate agencies and local officials shall be contacted before installing any structure in a flowing stream.

### **8.5.3 Conditions Where Practice Applies**

When used in conjunction with other appropriate sediment control measures, rock filter dams may reduce the amount of sediment reaching a water body. A rock filter dam may be used in small channels that drain 50 acres or less.

Rock filter dams shall be used as an additional sediment control measure below construction projects such as culvert installations, dam construction, or any project that may involve grading activity directly in a stream. Rock filter dams may also be used at the upstream end of ponds or lakes to trap incoming sediment loads.

### **8.5.4 Design Criteria**

Although formal design is not required, a qualified engineer shall be consulted before a structure of any kind is installed in a flowing stream.

- A. Drainage Area - The drainage area contributing to a rock filter dam shall not exceed 50 acres
- B. Height - The height of a rock filter dam shall not be higher than the channel banks or exceed the elevation of the upstream property line. The center of the dam shall be at least 6 inches lower than the outer edge of the dam (see Figure M-7).
- C. Side slopes - Side slopes shall be 2:1 or flatter.
- D. Location - A rock filter dam shall be located as close to the source of sediment as possible and so that it will not cause water to back up on upstream adjacent property.
- E. Stone Size - The stone size for a rock filter dam shall be determined by the design criteria set forth in the latest edition of the Manual for Erosion and Sediment Control in Georgia. For additional filtering effect, the dam shall be faced with the smaller stones on the upstream side. However, this may make the dam more prone to clogging.
- F. Top Width - The top of a rock filter dam shall be no less than 6 feet wide.
- G. Geotextile – To prevent the migration of soil particles from the subgrade into the graded stone, geotextiles shall be used as a separator between the graded stone, the soil base, and the abutments. The geotextile shall be specified in accordance with AASHTO M288-96 Section 7.5, *Permanent Erosion Control Recommendations*. The geotextile shall be placed immediately adjacent to the subgrade without any voids. To prevent scour the geotextile shall extend five feet beyond the downstream toe of the dam.

### **8.5.5 Construction Specifications**

The rock filter dam shall extend completely across the channel and securely ties into both channel banks. Rocks shall be placed by mechanical methods or by hand placement. The center of the dam shall be at least 6 inches lower than the outer edge of the dam (see Figure M-7). Gabions that have been sized and installed according to specification outlined in the latest edition of the Manual for Erosion and Sediment Control in Georgia may serve as a rock filter dam.

### **8.5.6 Maintenance**

Periodic inspection and required maintenance shall be provided. Sediment shall be removed when it reaches a depth of one-half of the original height of the dam. Rock filter dams shall be removed once the disturbed areas have been stabilized.

## **8.6 SEDIMENT BARRIER/FENCE**

### **8.6.1 Definition**

A sediment barrier/fence is a temporary structure typically constructed of a silt fabric supported by steel or wooden posts. Other barrier materials may include sandbags, straw bales, brush piles, or other filtering mediums.

### **8.6.2 Purpose**

To prevent sediment carried by sheet flow from leaving the site and entering natural drainage ways or storm drainage systems by slowing storm water runoff and causing the deposition of sediment at the structure.

### **8.6.3 Conditions Where Practice Applies**

Sediment barriers shall be installed where runoff can be stored behind the barrier without damaging the fence or the submerged area behind the fence. Silt fence shall not be installed across streams, ditches, waterways, or other concentrated flow area.

### **8.6.4 Planning Consideration**

Silt fences are usually preferable to hay bales because silt fences can trap a much higher percentage of suspended solids. The success of silt fences depends on a proper installation so as to develop maximum efficiency of trapping. Silt fences as well as hay bales shall be carefully installed to meet the intended purpose

Sediment barriers shall be used on all construction development sites. They shall be installed on the contour so that flow will not concentrate and cause bypassing, overtopping and/or failure. Sediment barriers shall remain in place and maintained until the disturbed areas have been permanently stabilized.

The primary sediment barrier is a silt fence. A silt fence is specifically designed to allow water to pass through while retaining sediment on the site. Silt fences shall be installed to be stable under the flows expected from the site. Silt fences are composed of woven filter fabric supported between steel or wooden posts. Silt fences are commercially available with geotextile attached to the post and can be rolled out and installed by driving the post into the ground. This type of silt fence is simple to install, but more expensive than some other installations. Silt fences must be trenched in at the bottom to prevent rills from developing under the fence (see Figures M-8a and M-8b).

Hay bale barriers are the next most common sediment barrier. Hay bales are laid end to end along the contour and anchored in place by driving wooden stakes through the bales into the soil. To prevent water from going under the barrier, the bales shall be embedded into the soil four inches (see Figure M-9). Sediment barriers shall be of sufficient length to eliminate end flow whenever it is constructed across a swale or ditch line. The plan configuration shall resemble an arc or horseshoe with ends oriented upstream (see Figure M-3).

#### 8.6.5 Design Criteria

- A. Silt fences may be premanufactured or built on site with post, wire and fabric. Silt fence fabric shall be selected from the approved fabrics listed in the Georgia Department of Transportation Qualified Products List #36 (QPL-36).
- B. Where all runoff is to be stored behind the fence (where no stormwater disposal system is present), the maximum slope length behind a silt fence shall not exceed those shown in Table M-4 and the latest edition of the Manual for Erosion and Sediment Control in Georgia. The drainage area shall not exceed ¼ acre for every 100 feet of silt fence.

<b>Table M-4 Criteria for Silt Fence Placement</b>	
<b>Land Slope (%)</b>	<b>Maximum Slope Length Above Fence (feet)</b>
<2	100
2 to 5	75
5 to 10	50
10 to 20	25
>20*	15

\*In areas where the slope is greater than 20%, a flat area length of 10 feet between the toe of the slope to the fence shall be provided.

Source: Manual for Erosion and Sediment Control in Georgia, 2000, Georgia Soil and Water Conservation Commission.

#### C. Types of Silt Fence

1. Type A silt fence has filter fabric that is 36 inches wide. A type A silt fence shall be used on developments where the life of the project is expected to be greater than or equal to six months.



2. Type B silt fence has filter fabric that is 22 inches wide. Type B silt fence shall be limited to use on minor projects, such as residential home sites or small commercial developments where permanent stabilization will be achieved in less than six months.
  3. Type C silt fence has wire reinforced filter fabric that is 36 inches wide. This type fabric allows almost three times the flow rate as Type A silt fence. Type C silt fence shall be used where runoff flows or velocities are particularly high or where slopes exceed a vertical height of 10 feet.
- D. A riprap splash pad or other outlet protection device shall be provided for any point where the flow may top the sediment fence, such as natural depressions or swales. At protected reinforced outlets the maximum height of the fence shall not exceed 1 foot and the fence support post spacing shall not exceed 4 feet.

#### **8.6.6 Construction Specifications**

- A. Sandbags: Shall be approved by local issuing authorities. Sandbags shall be installed such that flow under and between the bags is minimal. If the structure height exceeds two bags, it shall be anchored in place with steel rods.
- B. Hay or Straw Bales: Shall be approved by local issuing authorities. Bales shall be placed lengthwise on the contour in a single row and embedded in the soil a minimum depth of 4 inches. Bales shall be securely anchored in place by stakes, bars or other acceptable means (see Figure M-9). Stakes for hay bale barriers shall be nominal 2 inch by 2 inch wood. The wood shall be sound with a minimum length shall be 3 feet. The stakes shall be driven into the ground 18 to 24 inches. Equivalent metal rods or steel bars may be used.
- C. Brush Barrier: Shall be used only during timber clearing operations. Brush obtained from clearing and grubbing operation may be piled in a row along the perimeter of disturbance. Brush barriers shall not be used in developed areas or where aesthetics are a concern.

Brush shall be wind-rowed on the contour as nearly as possible. If compaction is necessary, construction equipment may be used for compaction operations. The brush barrier shall have a base width between 5 and 10 feet, and a height between 3 and 5 feet. To achieve greater filtering capacity, filter fabric shall be placed on the side of the brush barrier receiving sediment-laden runoff. The lower edge of the fabric shall be buried in a 6-inch deep trench immediately uphill from the barrier. The upper edge of the fabric shall be stapled, tied or otherwise fastened to the brush barrier. Edges of adjacent fabric pieces shall overlap each other.

#### D. Silt Fence

1. The filter fabric shall have an approved color mark yarn woven into the fabric or the manufacturer label and fabric name printed on the fabric every 100 feet.
2. The temporary silt fence shall be installed according to these specifications, as shown on construction plans or as directed by an engineer. For fabric installation specifications see Figures M-8a and M-8b and the latest edition of the Manual for Erosion and Sediment Control in Georgia.
3. Post installation shall start at the center of the low-point (if applicable) with the remaining posts spaced 6 feet apart for Type A and B silt fences and 4 feet apart for Type C silt fence. Wood and steel post may be used with Type A and Type B silt fences. Only steel post shall be used with Type C silt fence. For post size requirement see Figures M-8a and M-8b and the latest edition of the Manual for Erosion and Sediment Control in Georgia.
4. The filter fabric shall be securely fastened to the fencing with staples or nails or other fasteners made for this purpose (see Figure M-8a for fastener specifications). The bottom of the filter fabric shall be installed in a trench. The trench shall then be filled with the soil and compacted.
5. Along stream buffers and other sensitive areas, two rows of Type C silt fence or one row of Type C silt fence backed by haybales shall be used.

#### 8.6.7 Maintenance

Sediment barriers shall be inspected immediately after each rainfall and at least weekly during normal construction activities and daily during prolonged rainfall. Any needed repairs shall be made immediately. Fabric shall be replaced whenever it has deteriorated to such an extent that the effectiveness of the fabric is reduced (approximately six months).

Sediment deposits shall be removed when the deposits reach one-half the original height of the barrier. Any sediment deposits remaining after the sediment barrier is no longer required shall be smoothed to conform to the natural topography and the area restored as described earlier in Article 6.0.

### 8.7 INLET SEDIMENT TRAP

#### 8.7.1 Definition

An inlet sediment trap is a temporary protective device formed around a storm drain drop inlet to trap sediment.

### **8.7.2 Purpose**

Inlet sediment traps shall be used until the disturbed areas are permanently stabilized to prevent sediment from leaving the site, or from entering storm drainage systems.

### **8.7.3 Conditions Where Practice Applies**

Inlet sediment traps shall be installed at or around all storm drain drop inlets that receive runoff from disturbed areas.

### **8.7.4 Design Criteria**

The drainage area contributing to an inlet sediment trap shall be no greater than one acre. A variety of sediment filtering devices that can serve as temporary sediment traps are shown in Figures M-10a through M-10e. Sediment traps shall be self-draining unless they are otherwise protected in an approved manner that will not present a safety hazard.

A temporary dike shall be constructed on the down slope side of a sediment trap where runoff may bypass the protected inlet. Stone filter rings may be used on the up slope side of the inlet to slow runoff and filter larger soil particles. Refer to the latest edition of the Manual for Erosion and Sediment Control in Georgia for stone filter ring specifications.

Where additional sediment storage is required, an excavation shall be created around the inlet sediment trap. The excavated area shall be sized to provide a minimum storage capacity calculated at 67 cubic yards per acre of drainage area. All excavated sediment traps shall provide a minimum of 1.5 feet of sediment storage and shall not have side slopes steeper than 2:1.

### **8.7.5 Construction Specifications**

Sediment traps shall be constructed on natural ground surface, on an excavated surface, or on machine compacted fill provided they have a non-erodible outlet.

- A. Fabric Frame Inlet Sediment Traps: Filter fabric fitted around a supporting frame shall be used for inlet protection where the inlet drains a relatively flat area (slope no greater than 5 percent) and the inlets do not receive concentrated flows. The frame shall be constructed from Type C filter fabric supported by steel posts (see Figure M-10a). Stakes shall be spaced evenly around the perimeter of the inlet a maximum of 3 feet apart and securely driven into the ground approximately 18 inches deep. The fabric shall be entrenched 12 inches and backfilled with crushed stone or compacted soil. Fabric shall be securely fastened to the posts, and fabric ends shall be overlapped a minimum of 18 inches or wrapped together around a post.
- B. Baffle Box: A baffle box inlet sediment trap shall be used for inlets receiving runoff with a higher volume or velocity. The baffle box shall be constructed of 2"

x 4" boards spaced a maximum of 1 inch apart or of plywood with weep holes. The weep holes shall be 2 inches in diameter spaced approximately 6 inches on center vertically and horizontally. The entire box shall be wrapped in Type C filter fabric. The filter fabric shall be entrenched 12 inches and backfilled. Gravel shall be placed outside the box, all around the inlet, to a depth of 2 to 4 inches (see Figure M-10b).

- C. **Block and Gravel Drop Inlet Sediment Traps:** Block and gravel drop inlets shall be used where heavy flows are expected and where an overflow capacity is necessary to prevent excessive ponding around the structure. On each side of the structure one block, in the bottom row, shall be placed on its side to allow the pool to drain (see Figure M-10c). The foundation shall be excavated at least 2 inches below the crest of the storm drain. The bottom row of blocks shall be placed against the edge of the storm drain for lateral support and to avoid washouts when overflow occurs. When needed, lateral support shall be provided to subsequent rows by placing 2" x 4" wood studs through the block openings. To hold gravel in place, hardware cloth or comparable wire mesh with ½ inch openings shall be carefully fitted over all block openings. Clean gravel shall be placed to a height of 2 inches below the top of the block on a 2:1 slope or flatter and smoothed to an even grade. Georgia DOT #57 washed stone is recommended.
- D. **Gravel Drop Inlet Sediment Traps:** Gravel drop inlet protection shall be used where heavy concentrated flows are expected. The slope toward the inlet shall be no steeper than 3:1. To prevent gravel from entering the inlet, an area of level stone, that is a minimum of 1 foot wide, shall be placed between the structure and around the inlet. Stone that is 3 inches or larger in diameter shall be used on the slope toward the inlet. On the slope away from the inlet, #57 (½" to ¾" diameter) washed stone shall be placed in a layer at least one foot (1') thick (see Figure M-10d).
- E. **Sod Inlet Protection:** Sod inlet protection shall be used at the time of permanent seeding to protect inlets from sediment and mulch material until the permanent vegetation becomes established. The sod shall be placed to form a turf mat covering the soil for a distance of 4 feet from each side of the inlet structure. Sod strips shall be staggered so that adjacent strip ends are not aligned. Refer to Figure M-10e for sod inlet protection details.

### **8.7.6 Maintenance**

Sediment traps shall be inspected daily and after each rain. Repairs shall be made as needed. Sediment shall be removed when the sediment has accumulated to one-half the height of the trap. For excavated inlet sediment traps, sediment shall be removed when one-half the storage capacity has been lost due to sediment accumulation. Sediment that is removed from sediment traps shall be properly disposed of and stabilized so that it will not enter the inlet or any waters bodies. Sediment shall not be washed into the inlet. Sod inlet protection shall be maintained as specified in the latest edition of the Manual for Erosion and Sediment Control in Georgia.

Sediment traps shall be removed when the contributing drainage area has been adequately stabilized. All materials and any unstable soil shall be salvaged or properly disposed of. The disturbed area shall be brought back to proper grade then smoothed and compacted. All bare areas around the inlet shall be permanently stabilized.

## **8.8 TEMPORARY SEDIMENT BASIN**

### **8.8.1 Definition**

A temporary sediment basin is created by the construction of a barrier or dam across a concentrated flow area, by excavating a basin, or by a combination of both. Temporary sediment basins usually consist of a dam, a pipe outlet, and an emergency spillway. The size of the structure depends on the location, size of contributing drainage area, soil type, and rainfall pattern.

### **8.8.2 Purpose**

The purpose of a temporary sediment basin is to protect properties and drainage ways from damage caused by excessive sedimentation and debris from erodible areas. The water is temporarily stored and the bulk of the sediment carried by the water drops out and is retained in the basin before the water is automatically released.

### **8.8.3 Conditions Where Practice Applies**

This practice applies to critical areas where physical site conditions, construction schedules, or other restrictions preclude the installation or establishment of erosion and sediment control practices to satisfactorily reduce runoff, erosion, and sedimentation. The structure may be used in combination with other practices and shall remain in effect until the sediment-producing area is permanently stabilized.

This standard applies to the installation of temporary (to be removed within 18 months) sediment basins on sites where: (1) failure of the structure would not result in loss of life or interruption of use or service of public utilities, and (2) the contributing drainage area does not exceed 150 acres.

### **8.8.4 Design Criteria**

- A. Compliance with Laws and Regulations: Design and construction shall comply with federal, state, and local laws, ordinances, rules and regulations.
- B. Location: The sediment basin shall be located to obtain the maximum storage benefit from the terrain and for ease of cleanout of the trapped sediment. It shall also be located to minimize interference with construction activities and construction of utilities. Sediment basins shall be located so that storm drains discharge into the basin. They shall never be placed in live streams.

- C. Volume of Basin: The sediment storage volume of the basin, as measured to the crest elevation of the principal spillway, shall be at least 67 cubic yards per acre of disturbed area draining to the basin (67 cubic yards is equivalent to ½ inch of sediment per acre of drainage area). The entire contributing drainage area shall be used for this computation, rather than the disturbed area alone. The sediment shall be removed once approximately one-third of the storage volume of the basin has been lost to sediment accumulation
- D. Surface Area: Studies (Barfield and Clar, 1985) indicate that the following relationship between surface area and peak inflow rate gives a trapping efficiency from greater than 75 percent for clay loam to 96 percent for loamy sandy soils.

$$A = 0.01q$$

where A is the basin surface area in acres and q is the peak inflow rate in cfs. The area is measured at the crest of the principal spillway riser. The minimum peak inflow rate shall be determined from a 2-year, 24-hour storm.

- E. Shape of the Basin: To maximize detention time within the basin the designer shall incorporate features as listed below:
1. The length to width ratio shall be greater than 2:1 where length is the distance between the inlet and the outlet. Computation methods are described in the *Procedure for Determining or Altering Sediment Basin Shape* in the latest edition of the Manual for Erosion and Sediment Control in Georgia.
  2. A wedge shaped basin with the inlet located at the narrow end.
  3. Baffles or diversions.
- F. Spillways: Runoff shall be computed by the method outlined in the latest edition of the Manual for Erosion and Sediment Control in Georgia. Other approved equivalent methods may also be used. Runoff computations shall be based upon the worst soil-cover conditions expected to prevail in the contributing drainage area during the anticipated effective life of the structure. The combined capacities of the principal and emergency spillway shall be sufficient to pass the peak rate of runoff from a 25-year, 24-hour frequency storm. An emergency spillway shall be included in the design, even if the principal spillway is designed to convey the peak rate of runoff from a 25-year, 24-hour storm,
1. Principal Spillway: A spillway consisting of a vertical pipe or box type riser joined (watertight connection) to a pipe that extends through the embankment and outlet beyond the downstream toe of the fill shall be provided. The metal gauge thickness of the principal spillway shall comply with Georgia DOT or NRCS specification. The discharge shall be

based on a 2-year, 24-hour storm for the total drainage area without causing flow through the emergency spillway. The appropriate disturbed soil cover condition shall be used. The minimum pipe size shall be 8 inches in diameter. Refer to the *Pipe Flow Chart for Corrugated Metal Pipe Drop Inlet Principal Spillway Conduit* table and the *Weir Flow (Q) Over Riser Crest for Circular Risers with Trash Rack* table, in the latest edition of the Manual for Erosion and Sediment Control in Georgia, to determine the proper sizing of the principal spillway, the riser, and the trash rack.

- a. Crest Elevation: The crest elevation of the riser shall be a minimum of one foot below the elevation of the control section of the emergency spillway (see Figure M-11a).
- b. Watertight barrel assembly: The riser and all pipe connections shall be completely watertight except for the inlet opening at the top or dewatering openings, and shall not have any other holes, leaks, rips or perforations.
- c. Dewatering the basin: Retention time within the basin is an important factor in effective sedimentation retention. The method used to dewater the sediment basin shall be selected from the following;
  1. Perforated Riser Pipe: The lower half of the riser shall be perforated with ½ inch holes spaced approximately 3 inches apart. The riser pipe shall then be covered with two feet of 3 to 4 inch stone (see Figure M-11a).
  2. Skimmer Outlet: The skimmer-type dewatering device operates at the surface of the ponded water and will not withdraw sediment from the submerged volume of the basin. Skimmers discharge 45 percent less sediment mass than conventional perforated risers. However, skimmers are mechanically more complex and shall require frequent inspection and maintenance in order to operate as designed.
- d. Trash rack and anti-vortex device: A trash rack and anti-vortex device shall be securely installed on top of the riser as detailed in the latest edition of Manual for Erosion and Sediment Control in Georgia.
- e. Base: The riser shall have a base attached with a watertight connection and shall have sufficient weight to prevent flotation of the riser. A concrete base 18" thick with the riser embedded 9" in the base is recommended. The minimum factor of safety shall be

1.20 (downward forces = 1.20 x upward forces). Refer to Table M-5 for volume of concrete required for risers and Figure M-11b for concrete riser base details.

<b>Table M-5 Concrete Volume Required to Prevent Flotation of Riser</b>		
<b>Riser Pipe Diameter (inches)</b>	<b>Buoyant Force (lbs./Vertical Foot of Riser Height)<sup>1</sup></b>	<b>Volume of concrete per Vertical Foot of Riser Height (c.f./V.F.) Needed to Prevent<sup>2</sup> Flotation</b>
12	49.0	0.69
18	110.3	1.54
21	150.1	2.10
24	196.0	2.75
30	306.3	4.29
36	441.1	6.18
48	784.1	10.98
54	992.4	13.90
60	1225.2	17.16

<sup>1</sup>The weight of the riser pipe is negligible.

<sup>2</sup> Includes a factor of safety of 1.2.

Source: Manual for Erosion and Sediment Control in Georgia, 2000, Georgia Soil and Water Conservation Commission.

f. Anti-Seep Collars: One anti-seep collar shall be installed around the pipe, near the center of the dam, when any of the following conditions exist:

1. The settled height of the dam is greater than 15 feet.
2. The conduit is smooth pipe larger than 8" in diameter.
3. The conduit is corrugated metal pipe larger than 12" in diameter.

Use an anti-seep collar with an 18-inch projection for heads (H) less than or equal to 10 feet and a 24-inch projection for heads (H) greater than 10 feet. The anti-seep collar and its connection shall be watertight.

g. Outlet: An outlet shall be provided, including a means of conveying the discharge in an erosion-free manner to an existing stable area. Where discharge occurs at the property line, drainage



easements shall be obtained in accordance with local ordinances. Adequate notes and references shall be shown on the erosion and sediment control plan. Protection against scour at the discharge end of the pipe spillway shall be provided. Measures may include excavated plunge pools, riprap, impact basins, revetments, or other approved methods. For storm drain outlet protection specifications refer to the latest edition of the Manual of Erosion and Sediment Control in Georgia.

2. Emergency Spillway: The entire flow area of the emergency spillway shall be constructed in undisturbed ground (not fill). The emergency spillway cross-section shall be trapezoidal with a minimum bottom width of eight feet. This spillway channel shall have a straight control section of at least 20 feet in length and a straight outlet section for a minimum distance equal to 25 feet.
  - a. Capacity: The minimum capacity of the emergency spillway shall be that required to pass the peak rate of runoff from the 25-year, 24-hour frequency storm, less any reduction due to flow in the principal spillway. The appropriate disturbed soil cover condition shall be used. Emergency spillway dimensions shall be determined by using the method described in the latest edition of the Manual for Erosion and Sediment Control in Georgia.
  - b. Velocities: The velocity of flow in the exit channel shall not exceed 5 feet per second for vegetated channels. For channels with erosion protection other than vegetation, velocities shall be within the non-erosive range for the type of protection used. Vegetation, riprap or concrete shall be provided to prevent erosion. For channel stabilization specifications refer to the latest edition of the Manual for Erosion and Sediment Control in Georgia.
  - c. Freeboard: Freeboard is the difference between the design high water elevation in the emergency spillway and the top of the settled embankment. The freeboard shall be at least one foot.
- G. Entrance of Runoff Into the Basin: The points of entrance of surface runoff into excavated sediment basins shall be protected to prevent erosion and sediment generation (for specifications refer to the latest edition of the Manual for Erosion and Sediment Control in Georgia). Dikes, swales or other water control devices shall be installed as necessary to direct runoff into the basin. To maximize travel time, the points of runoff entry shall be located as far away from the riser as possible.

### 8.8.5 Construction Specifications

- A. Site Preparation: The areas under the embankment and under structural works shall be cleared, grubbed, and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed and disposed of by approved methods. In order to facilitate clean-out or restoration, the pool area (measured at the top of the pipe spillway) shall be cleared of all brush and trees.
- B. Cut-off Trench: A cut-off trench shall be excavated along the centerline of earth fill embankments. The minimum depth shall be 2 feet. The cut-off trench shall extend up both abutments to the riser crest elevation. The minimum bottom width shall be 4 feet, but wide enough to permit operation of compaction equipment. The side slopes shall be no steeper than 1:1. Compaction requirements shall be the same as those for the embankment. The trench shall be drained during the backfilling and compaction operations.
- C. Embankment: The fill material shall be taken from approved areas shown on the plans. It shall be clean mineral soil free of roots, woody vegetation, oversized stones, rocks or other objectionable material. Relatively pervious materials such as sand or gravel (Unified Soil Classes GW, GP, SW & SP) shall be placed in the downstream section of the embankment. Areas on which fills are to be placed shall be scarified prior to placement of fill. The fill material shall contain sufficient moisture so that it can be formed by hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Fill material shall be placed in six-inch to eight-inch thick continuous layers over the entire length of the fill. Compaction shall be obtained by routing and hauling the construction equipment over the fill so that the entire surface of the fill is traversed by at least one wheel or tread track of the equipment or by the use of a compactor. The embankment shall be constructed to an elevation 5 percent higher than the design height to allow for settlement.
- D. Principal Spillway: The riser shall be securely attached to the pipe or pipe stub by welding the full circumference making a watertight structural connection. The pipe stub must be attached to the riser at the same percent (angle) of grade as the outlet conduit. The connection between the riser and the riser base shall be watertight. All connections between pipe sections must be achieved by approved watertight band assemblies. The pipe and riser shall be placed on a firm, smooth foundation of impervious soil as the embankment is constructed. Breaching the embankment is unacceptable. Pervious materials such as sand, gravel, or crushed stone shall not be used as backfill around the pipe or anti-seep collar. The fill material around the pipe spillway shall be placed in four-inch layers and compacted under and around the pipe to at least the same density as the adjacent embankment. Care must be taken not to raise the pipe from firm contact with its foundation when compacting under the pipe hunches. A minimum depth of two feet of hand compacted backfill shall be placed over the pipe spillway before crossing it with construction equipment.

- E. Emergency Spillway: The emergency spillway shall be installed on undisturbed ground. The achievement of planned elevations, grades, design width, entrance and exit channel slopes are critical to the successful operation of the emergency spillway and shall be constructed within a tolerance of  $\pm 0.2$  feet. If the emergency spillway requires erosion protection other than vegetation, the lining shall not compromise the capacity of the emergency spillway.
- F. Vegetative Treatment: The embankment and all other disturbed areas shall be stabilized in accordance with the appropriate permanent vegetative measure immediately following construction. In no case shall the embankment remain unstabilized for more than seven (7) days. For disturbed area stabilization techniques refer to Articles 8.10 through 8.14 and the latest edition of the Manual for Erosion and Sediment Control in Georgia.
- G. Erosion and Pollution Control: Construction operations shall be carried out in such a manner that erosion and water pollution will be minimized. State and local law concerning pollution abatement shall be complied with.
- H. Safety: State and local requirements shall be met concerning fencing and signs warning the public of hazards of soft sediment and floodwater.

#### **8.8.6 Maintenance**

All damages caused by soil erosion or construction equipment shall be repaired at or before the end of each working day. Sediment shall be removed from the basin when it reaches the specified distance below the top of the riser. This sediment shall be placed and stabilized in such a manner that it will not erode from the site. Sediment shall not enter adjacent streams or drainageways during sediment removal or disposal. The sediment shall not be deposited downstream from the embankment, adjacent to a stream or floodplain.

#### **8.8.7 Final Disposal**

When temporary structures have served their intended purpose and the contributing drainage area has been properly permanently stabilized, the embankment and resulting sediment deposits shall be leveled or otherwise disposed of in accordance with the approved sediment control plan. The proposed use of a sediment basin site will often dictate final disposition of the basin and any sediment contained therein. If the site is scheduled for future construction, then the embankment and trapped sediment shall be removed, safely disposed of, and backfilled with a structural fill. When the basin area is to remain open space, the pond shall be pumped dry, graded and backfilled.

#### **8.8.8 Plan Information to be Submitted**

Sediment basin designs and construction plans shall be submitted for review to the City,

the Soil and Water Conservation District and/or other agencies. The erosion and sediment control plan shall include the following:

1. The specific location of the basin showing existing and proposed contours.
2. Maintenance equipment access points.
3. Figures detailing the cross-section of the dam, principal spillway and emergency spillway, and the profile of the emergency spillway.
4. Details of the trash rack, concrete riser base, and outlet structure assembly.

The following shall be submitted on 8 ½" x 11" attachments;

1. A hydrological study, including information regarding state/storage relationship.
2. A temporary sediment basin design sheet
3. Figures detailing the cross-section of the dam, principal spillway and emergency spillway, and the profile of the emergency spillway.

#### **8.8.9 Procedure for Determining or Altering Sediment Basin Shape**

As specified in the latest edition of the Manual for Erosion and Sediment Control in Georgia, the pool area at the elevation of the principal spillway crest shall have a length to width ratio of at least 2:1. The purpose of this requirement is to minimize the "short-circuiting" effect of the sediment laden inflow to the riser and thereby increasing the effectiveness of the sediment basin. This procedure provides alternative parameters and methods of determining and modifying the shape of the basin.

The length of the flow path (L) is the distance from the point of inflow to the riser (outflow point). The point of inflow is the point that the stream enters the normal pool (level at the riser crest elevation). The pool area (A) is the area of the normal pool. The effective width ( $W_e$ ) equals the area (A) divided by the length (L). The length to width ratio (L:W) is found by the equation:

$$L : W = L / W_e \text{ where, } W_e = A / L.$$

In the event there is more than one inflow point, any inflow point which conveys more than 30 percent of the total peak inflow shall meet the length-width ration criteria.

The required basin shape may be obtained by proper site selection, by excavation, or by constructing a baffle in the basin. The purpose of the baffle is to increase the effective flow length from the inflow point to the riser. Baffles shall be placed mid-way between the inflow point and the riser. The baffle length shall be as required to provide the minimum 2:1 length-width ratio. The effective length ( $L_e$ ) shall be the shortest distance

the water must flow from the inflow point around the end of the baffle to the outflow point. Then:

$$L : W = L_e / W_e \text{ where, } W_e = A / L_e$$

See Figure M-11c for examples of sediment basin baffles. Note that the special case shown in Example C is allowable only when the two flow paths are equal.

The dimensions necessary to obtain the required basin volume and surface area shall be clearly shown on the plans to facilitate plan review, construction, and inspection.

## **8.9 TEMPORARY SEDIMENT TRAPS**

### **8.9.1 Definition**

A small, temporary ponding basin formed by constructing an earthen embankment with a control outlet, generally constructed of rock or gravel.

### **8.9.2 Purposes**

To detain sediment-laden runoff from small disturbed areas long enough to allow the majority of the sediment to settle out.

### **8.9.3 Conditions Where Practice Applies**

- A. Sediment trap shall be used no longer than 18 months.
- B. The sediment trap shall be constructed either independently or in conjunction with a temporary diversion dike.
- C. Sediment traps shall be used only for small drainage areas. If the contributing drainage area is greater than 5 acres refer to Article 8.8 and the latest edition of the Manual for Erosion and Sediment Control in Georgia, for temporary sediment basins design and construction specifications.
- D. Sediment shall be periodically removed from the trap. Plans shall detail how this sediment is to be disposed of, such as by use in fill areas on site or removal to an approved off-site dump
- E. Sediment traps, along with other perimeter controls, shall be installed before any land disturbance takes place in the drainage area.

### **8.9.4 Design Criteria**

- A. Drainage area for a sedimentation trap shall not exceed 5 acres.
- B. Storage capacity: The sediment trap shall have an initial storage volume of 67

yd<sup>3</sup>/acre of disturbed area, measured from the low point of the ground to the crest of the gravel outlet. Sediment shall be removed from the basin when the volume is reduced by one-half.

For a natural basin, the volume may be approximated as follows:

$$V = 0.4 \times A \times D.$$

Where:

V = the storage volume, ft<sup>3</sup>

A = the surface area of the flooded area at the crest of the outlet, ft<sup>2</sup>

D = the maximum depth, measured from the low point in the trap to the crest of the outlet, ft.

- C. Excavation: If excavation is necessary to attain the required storage volume, side slopes shall be no steeper than 2:1.
- D. Outlet: The outlet for the sediment trap generally consists of a crushed stone section of the embankment located at the low point in the basin. The minimum length of the outlet crest shall be 6 feet times the acreage of the drainage area. The crest of the outlet shall be at least 1.0 foot below the top of the embankment, to insure that the flow will travel over the stone and not the embankment.
- E. Embankment Cross-Section: The maximum height of the sediment trap embankment shall be 5 feet as measured from the low point. The minimum top widths (W) and outlet heights (H<sub>o</sub>) for various embankment heights (H) are shown in Table M-6. The side slopes of the embankment shall be 2:1 or flatter (see Figure M-12).

**Table M-6 Minimum Top Width and Outlet Height Requirements for Temporary Sediment Traps**

<b>Embankment Height (H)</b>	<b>Outlet Height (H<sub>o</sub>)</b>	<b>Minimum Embankment Top Width (W)</b>
1.5	0.5	2.0
2.0	1.0	2.0
2.5	1.5	2.5
3.0	2.0	2.5
3.5	2.5	3.0
4.0	3.0	3.0
4.5	3.5	4.0
5.0	4.0	4.5

Source: City of Atlanta, Georgia – Stormwater Design Manual, 1996.

### **8.9.5 Construction Specifications**

- A. The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat. To facilitate cleanout, the pool area shall be cleared.
- B. Fill material for the embankment shall be free of roots or other woody vegetation, organic material, large stones, and other objectionable material. The embankment shall be compacted in 8-inch layers by traversing with construction equipment.
- C. The earthen embankment shall be seeded with temporary or permanent vegetation within 7 days of construction.
- D. Construction operations shall be carried out in such a manner that erosion and water pollution are minimized.
- E. All cut and fill slopes shall be 2:1 or flatter.

### **8.9.6 Maintenance**

Temporary sediment traps shall be inspected after each period of significant rainfall. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. The sediment removed shall be placed in the designated disposal area. The contaminated part of the gravel facing shall be replaced.

The structure shall be checked for damage from erosion or piping. The depth of the spillway shall be checked periodically to ensure it is a minimum of 1.0 ft below the low point of the embankment. Any observed settlement of the embankment shall be filled immediately to slightly above design grade. Any riprap displaced from the spillway shall be replaced immediately.

After all sediment-producing areas have been permanently stabilized, the structure and all unstable sediment shall be removed. The area shall be smoothed to blend with the adjoining areas and restored as described later in this document.

## **8.10 DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)**

### **8.10.1 Definition**

Application of a protective layer of plant residues or other suitable materials produced on the site if possible, to the soil surface.

### **8.10.2 Purpose**

Applying mulch to disturbed areas may reduce runoff and erosion, conserve moisture, prevent surface compaction or crusting, control undesirable vegetation, modify soil temperature, and increase biological activity in the soil.

### **8.10.3 Requirement for Regulatory Compliance**

Mulch or temporary grassing shall be applied to all exposed areas within 14 day of disturbance. Mulch can be used as a singular erosion and sediment control device for up to six months, but shall be applied at the appropriate depth, anchored, and have a continuous cover over at least 90 percent of the soil surface. Maintenance shall be required to maintain appropriate depth and 90 percent coverage. If the area will require erosion and sediment control for less than six months, temporary vegetation may be used instead of mulch. If an area will require erosion and sediment control for more than six months, permanent vegetative techniques shall be used. For temporary and permanent vegetation specification see Articles 8.11 through 8.13 and the latest edition of the Manual for Erosion and Sediment Control in Georgia.

### **8.10.4 Specifications**

Mulching Without Seeding: This standard applies to grades or cleared areas where seedlings may not have a suitable growing season to produce an erosion retardant cover, but which can be stabilized with a mulch cover.

#### **A. Site Preparation**

1. Necessary grading shall be performed to permit the use of equipment for applying and anchoring mulch.
2. Erosion and sediment control measures such as dikes, diversion, berms, terraces and sediment barriers shall be installed as needed.
3. Compacted soil shall be loosened to a minimum depth of 3 inches.

#### **B. Mulching Materials**

1. Dry straw or hay shall be applied at a depth of 2 to 4 inches providing the soil is completely covered.
2. Wood waste (chips, sawdust or bark) shall be applied at a depth of 2 to 3 inches. Where feasible, organic material from the clearing stage of development shall remain on site, be chipped, and applied as mulch. This method of mulching can greatly reduce erosion and sediment control costs.
3. Polyethylene film shall be secured over banks or stockpiled soil material for temporary protection. This material can be salvaged and re-used.

#### **C. Applying Mulch**

1. Dry straw or hay mulch and wood chips shall be uniformly applied by hand or by mechanical equipment.



2. If the area will eventually be covered with perennial vegetation, 20-30 pounds of nitrogen per acre in addition to the normal amount shall be applied to offset the uptake of nitrogen caused by the decomposition of the organic mulches.
3. Apply polyethylene film on exposed areas.

D. Anchoring Mulch

1. Straw or hay mulch may be pressed into the soil using a disk harrow with the disk set straight or with a special “packer disk.” The disks shall be smooth or serrated and shall be 20 inches or more in diameter and spaced 8 to 12 inches apart. The edges of the disks shall be dull enough not to cut the mulch but to press it into the soil leaving much of it in an erect position. Straw or hay mulch shall be anchored immediately after application.
2. Appropriately sized netting shall be used to anchor wood waste. The openings of the netting shall not be larger than the average size of the wood waste chips.
3. Polyethylene film shall be anchored by trenching at the top and incrementally as necessary.

### **8.10.5 Maintenance**

All mulches shall be inspected periodically, and after rainstorms to check for rill erosion, dislocation, or failure. Where erosion is observed, additional mulch shall be applied. If washout occurs, the slope grade shall be repaired, reseeded, and the mulch reinstalled. Inspections shall continue until the permanent vegetation has been firmly established.

## **8.11 DISTURBED AREA STABILIZATION (WITH TEMPORARY SEEDING)**

### **8.11.1 Definition**

Planting rapid growing seeds to provide initial, temporary cover for erosion and sediment control on disturbed and denuded areas.

### **8.11.2 Purpose**

The purpose of temporary seeding is to reduce erosion, sediment and runoff damages to downstream resources until permanent vegetation or other erosion and sediment control measures can be established. In addition, it provides residue for soil protection and seedbed preparation and reduces problems of mud and dust production from bare soil surfaces during construction. Other purposes may include improvement of wildlife habitat, aesthetics, tilth, infiltration, and aeration.

### **8.11.3 Requirement for Regulatory Compliance**

Mulch and temporary grassing shall be applied to all exposed areas within 14 days of disturbance. Temporary grassing, instead of mulch, can be applied to rough graded areas that will be exposed for less than six months. If an area will require erosion and sediment control for longer than six months, permanent perennial vegetation shall be used. If optimum planting conditions for temporary grassing is lacking, mulch can be used as a singular erosion and sediment control device for up to six months but it shall be applied at the appropriate depth, anchored, and have a continuous cover over at least 90 percent of the soil surface. For mulch specifications refer Article 8.10 and to the latest edition of the Manual for Erosion and Sediment Control in Georgia.

### **8.11.4 Conditions Where Practice Applies**

On any cleared, bare, or sparsely vegetated soil surfaces where vegetative cover is needed for up to six months, or until establishment of finished grade or a permanent vegetative cover. Applications of this practice include diversions, dams, temporary sediment basins, temporary road banks, and soil stockpiles. Temporary vegetative measures shall be coordinated with permanent measures to assure economical and effective stabilization. Some species of temporary vegetation are not appropriate as companion crop for permanent vegetation because of their potential to out-compete the permanent species. Contact the NRCS of the local SWCD for more information.

### **8.11.5 Specifications**

- A. Grading and Shaping: Slopes that can be stabilized by hand-seeded vegetation or with hydraulic seeding equipment may not require shaping or grading. Erosion and sediment control practices such as closed drains, ditches, dikes, diversions, sediment basins and others shall be installed for areas where excessive water run-off needs to be controlled.
- B. Seedbed Preparation: Good seedbed preparation is essential to successful plant establishment. A good seedbed is well pulverized, loose, and smooth. Sealed or crusted surfaces shall be loosened just prior to seeding to provide a place for seeds to lodge and germinate. Soil that is sealed or crusted shall be pitted, trenched or otherwise scarified by disking, raking, harrowing, or other suitable methods.

When hydroseeding methods are use, seedbed preparation shall not be required. When using conventional or hand seeding is used and the soil material is loose and not sealed by rainfall, seedbed preparation is not be required.

- C. Lime and Fertilizer: Soils shall be tested to determine if fertilizer is needed. Fertilizer shall not be required on reasonably fertile soils or soil material. For soils with very low fertility, 500 to 700 pounds of 10-10-10 fertilizer or the equivalent shall be applied per acre. To better incorporate the fertilizer into the soil, the fertilizer shall be applied before land preparation procedures occur.

Agricultural lime is required unless soil tests indicate otherwise. Apply agricultural lime at a rate of one ton per acre. Graded areas require lime application.

- D. Seeding: A grass or grass-legume mixture suitable to the area and season of the year shall be selected from the Plants, Planting Rates, and Planting Dates for Temporary Cover or Companion Crops Table, in the latest edition of the Manual for Erosion and Sediment Control in Georgia. Seed shall be uniformly applied by hand, cyclone seeder, drill, cultipacker-seeder, or hydraulic seeder (slurry including seed and fertilizer). Drill or cultipacker-seeders shall normally place seed one-quarter to one-half to one inch deep. Appropriate depth of planting is ten times the seed diameter. Soil shall be “raked” lightly to cover the seed with soil if seeded by hand.
- E. Mulching: In most cases temporary vegetation can be established without the use of mulch. Mulch without seeding may be considered for short-term protection. For disturbed area stabilization with mulch see Article 8.10 and the latest edition of the Manual of Erosion and Sediment Control in Georgia.
- F. Irrigation: During times of drought, water shall be applied at a rate that will not cause runoff and erosion. The soil shall be thoroughly wet to a depth that will insure germination of the seed. Subsequent applications shall be made when needed.

## **8.12 DISTURBED AREA STABILIZATION (WITH PERMANENT VEGETATION)**

### **8.12.1 Definition**

Planting perennial vegetation such as trees, shrubs, vines, grasses, or legumes, on exposed areas for final permanent stabilization. Permanent perennial vegetation shall be used to achieve final stabilization.

### **8.12.2 Purpose**

The purpose of establishing permanent vegetation in disturbed areas is to protect the soil surface from erosion, reduce damage from sediment and runoff to downstream areas, improve wildlife habitat and visual resources and improve aesthetics.

### **8.12.3 Requirement for Regulatory Compliance**

This practice or sod shall be applied immediately to rough graded areas that will require erosion and sediment control for longer than six months or to all areas at final grade. For disturbed area stabilization using sod refer to Article 8.13 and the latest edition of the Manual for Erosion and Sediment Control in Georgia. Final stabilization means that all soil disturbing activities at the site have been completed, and that for unpaved areas and areas not covered by permanent structures, at least 70 percent of the soil surface is

uniformly covered in permanent vegetation or equivalent permanent stabilization measures (such as the use of riprap, gabions, permanent mulches or geotextiles) have been employed.

Permanent vegetation is the planting of perennial vegetation such as trees, shrubs, vines, grasses, or legumes, on exposed areas for permanent soil stabilization. A crop of perennial vegetation appropriate for the region which is capable of providing a 70 percent coverage within the growing season shall be used to achieve permanent soil stabilization. Acceptable plants and grasses are listed in Section 5.0 of this document and the latest edition of the Manual for Erosion and Sediment Control in Georgia.

#### **8.12.4 Conditions Where Practice Applies**

Permanent perennial vegetation shall be used to provide a protective cover for exposed areas including cuts, fills, dams, and other denuded areas.

#### **8.12.5 Planning Considerations**

- A. Conventional planting methods shall be used where possible.
- B. To aid in the establishment of permanent cover, companion crops shall be used. This technique is especially helpful during marginal planting periods.
- C. Following a summer or winter annual cover crop, no-till planting shall be used. An excellent procedure is to use no-till planting of sericea lespedeza into stands of rye.
- D. Block sod provides immediate cover and shall be used to control erosion adjacent to concrete flumes and other structures. For disturbed area stabilization using sod specifications refer Article 8.13 and the latest edition of the Manual for Erosion and Sediment Control in Georgia.
- E. Irrigation shall be used when the soil is dry or when summer plantings are done.
- F. To ensure long-lasting erosion and sediment control, low maintenance native plants shall be used.
- G. Mowing shall not be performed during the quail nesting season, (September to April).
- H. In critical area plantings wildlife plantings shall be included.

**Wildlife Plantings** – Commercially available plants beneficial to wildlife species include the following:

Mast Bearing Trees – Beech, Black Cherry, Blackgum, Chestnut, Chinkapin, Hackberry, Hickory, Honey Locust, Native Oak, Persimmon, Sawtooth Oak and Sweetgum. All trees that produce nuts or fruits are favored by many game species. Hickory provides nuts used mainly by squirrels and bear.

Shrubs and Small Trees – Bayberry, Bicolor Lespedeza, Crabapple, Dogwood, Huckleberry or Native Blueberry, Mountain Laurel, Native Holly, Red Cedar, Red Mulberry, Sumac, Wax Myrtle, Wild Plum and Blackberry. Plant in patches without tall trees to develop stable shrub communities. All produce fruits used by many kinds of wildlife, except for lespedeza which produces seeds used by quail and songbirds.

Grasses, Legumes, Vines, and Temporary Cover – Bahiagrass, Bermudagrass, Grass-Legume mixture, Partridge Pea, Annual Lespedeza, Orchardgrass (for mountains), Browntop Millet (for temporary cover) and Native grapes. Provides herbaceous cover in clearings for a game bird brood-rearing habitat. Appropriate legumes such as vetches, clovers and lespedezas may be mixed with grass, but they may die out after a few years.

#### **8.12.6 Construction Specifications**

- A. Grading and Shaping: Slopes that can be stabilized by hand-seeded vegetation or with hydraulic seeding equipment may not require shaping or grading. Vertical banks shall be sloped to ensure plant establishments.

When using conventional seeding and fertilizing the slope shall be graded and shaped, where feasible and practical, so that equipment can be used safely and efficiently during seedbed preparation, seeding, mulching, and maintenance of the vegetation.

Concentrations of water that will cause excessive soil erosion shall be diverted to a safe outlet. Erosion and sediment control practices shall conform to the appropriate standards and specifications contained in this section and the latest edition of the Manual for Erosion and Sediment Control in Georgia.

- B. Lime and Fertilizer

1. Rates and Analysis: In areas where permanent vegetation is to be established, agricultural lime shall be applied as indicated by soil test or at a rate of one to two tons per acre. Graded areas require lime application. Agricultural lime shall not be required in areas to be planted with only trees. If lime is applied within six months of planting permanent perennial vegetation, additional lime shall not be required. Agricultural lime shall be within the specifications of the Georgia Department of Agriculture.

Lime spread by conventional equipment shall be “ground limestone.” Ground limestone is calcitic or dolomitic limestone that has been ground so that 90 percent of the material will pass through a 10-mesh sieve, not less than 50 percent will pass through a 50-mesh sieve, and not less than 25 percent will pass through a 100-mesh sieve.

Agricultural lime spread by hydraulic seeding equipment shall be “finely ground limestone.” Finely ground limestone is calcitic or dolomitic limestone ground so that 98 percent of the material will pass through a 20-mesh sieve and not less than 70 percent will pass through a 100-mesh sieve.

Refer to the Fertilizer Requirements table in the latest edition of the Manual for Erosion and Sediment Control in Georgia for initial fertilization, nitrogen, topdressing, and maintenance fertilizer requirements for a particular species or combination of species.

2. Application: When hydraulic seeding equipment is used the initial fertilizer shall be applied in a mixed slurry of seed, inoculant (if needed), and wood cellulose or wood pulp fiber mulch. The slurry mixture shall be kept thoroughly mixed throughout the application and shall be uniformly spread over the area within one hour after being placed in the hydroseeder.

Finely ground limestone will be mixed with water and applied immediately after mulching is completed or in combination with the top dressing.

When conventional planting is used the lime and fertilizer shall be applied uniformly in one of the following ways:

- a. Apply before land preparations so that it will be mixed into the soil during seedbed preparation
- b. Mix with the soil to be used to fill the holes or distribute in furrows
- c. Broadcast after steep surfaces are scarified, pitted or trenched
- d. A fertilizer pellet shall be placed at root depth beside each pine tree seeding.

- C. Plant Selection: For approved species refer to Section 5.0 and the Plants, Planting Rates, and Planting Dates for Permanent Cover, Durable Shrubs and Ground Covers for Permanent Cover, and Trees for Erosion Control tables in the latest edition of the Manual for Erosion and Sediment Control in Georgia. Before using any species not listed, it shall be approved by the State Resource Conservation of the Natural Resources Conservation Service.

Plants shall be selected on the basis of species characteristics; site and soil conditions; planned use and maintenance of the area; time of year of planting; method of planting and the needs and desires of the land user.

Some perennial species are easily established and can be planted alone. Other perennials are slow to become established and shall be placed with another perennial species. The additional species will provide quick cover and ample soil protection until the target perennial species becomes established.

Plant selections may also include annual companion crops. Annual companion crops shall be used only when the perennial species are not planted during their optimum planting period. Care shall be taken in selection of companion crop species and seeding rates because annual crops will compete with perennial species for water, nutrients and growing space. Ryegrass shall not be used in any seeding mixtures containing perennial species due to its ability to out-compete desired species chosen for permanent perennial cover.

Seed Quality - The term "pure live seed" is used to express the quality of seed. Pure live seed, PLS, is expressed as a percentage of the seeds that are pure and will germinate. The percent of PLS helps to determine the amount of seed needed. For further information and an example of calculating PLS refer to the Disturbed Area Stabilization (with Permanent Vegetation) section in the latest edition of the Manual for Erosion and Sediment Control in Georgia.

- D. Seedbed Preparation: Seedbed preparation may not be required where hydraulic seeding and fertilizing equipment is to be used. When using conventional seeding, seedbed shall be prepared as follows:
- E. Broadcast plantings: Minimum tillage shall adequately loosen the soil to a depth of 4 to 6 inches; alleviate compaction; incorporate lime and fertilizer; smooth and firm the soil; allow for the proper placement of seed, sprigs, or plants; and allow for the anchoring of straw or hay mulch if a disk is to be used. Tillage shall be performed with any suitable equipment. Where feasible, tillage shall be done on the contour. Where slopes are too steep for the safe operation of tillage equipment, the soil surface shall be pitted or trenched across the slope with hand tools to provide two places 6 to 8 inches apart in which seed may lodge and germinate. Hydraulic seeding may also be used
- F. Individual plants: In areas where individual plants are to be set, the soil shall be well prepared by excavating holes, opening furrows, or dibble planting. When using nursery stock plants, holes shall be large enough to accommodate roots without crowding.

Four to six months prior to planting pine seedlings, the area shall be subsoiled 36 inches deep on the contour. Subsoiling shall be done when the soil is dry, preferably in August or September.

- G. Inoculants: All legume seed shall be inoculated with appropriate nitrogen-fixing bacteria. The inoculant shall be a pure culture prepared specifically for the seed species and used before the expiration date. A mixing medium recommended by the manufacture shall be used to bond the inoculant to the seed. All inoculated seed shall be protected from the sun and high temperatures and shall be planted the same day inoculated.

For conventional seeding, two times the amount of inoculant recommended by the manufacturer shall be used. For hydraulic seeding, four times the amount of inoculant recommended by the manufacture shall be used. No inoculated seed shall remain in the hydroseeder longer than one hour.

H. Planting

Hydraulic seeding: A slurry consisting of seed, inoculant, fertilizer, wood cellulose or wood pulp fiber mulch, and water shall be uniformly applied to the area to be treated. Apply within one hour after the mixture is made.

Conventional seeding: Seeding shall be done on a freshly prepared and firmed seedbed. To insure uniform distribution of the seed during broadcast planting, a cultipacker-seeder, drill, rotary seeder, other mechanical seeder, or hand seeding shall be used. The seed shall be covered lightly with 1/8 to 1/4 inch of soil for small seed and 1/2 to 1 inch for large seed when using a cultipacker or other suitable equipment.

No-till seeding: This application is permissible into annual cover crops when planting is done following maturity of the cover crop or if a temporary cover stand is sparse enough to allow adequate growth of the permanent species. Seed shall be uniformly distributed and planted at the proper depth. No-till seeding shall be performed with appropriate no-till seeding equipment.

Individual plants: Shrubs, vines and sprigs shall be planted with appropriate planters or hand tools. Pine trees shall be planted manually in the subsoil furrow. Nursery stock plants shall be planted at the same depth or slightly deeper that they grew at the nursery. The tips of vines and sprigs shall be at or slightly above the ground surface. Where individual holes are dug, fertilizer shall be placed in the bottom of the holes, followed by the addition of two inches of soil and setting of the plant. All plants shall be set in a manner that will avoid crowding of the roots.

- I. Mulching: Mulch shall be used on all permanent vegetation application. Mulch applied to seeded areas shall achieve 75 percent soil cover.

Mulching material and rate of application shall consist of one of the following:

1. Dry straw or dry hay : Straw or hay that is dry, of good quality and free of weed seeds shall be used. Straw shall be applied at the rate of 2 tons per acre. Hay shall be used at a rate of 2 1/2 tons per acre.



2. Wood cellulose mulch or wood pulp fiber: Wood cellulose or wood pulp fiber shall be used with hydraulic seeding. It shall be applied at the rate of 500 pounds per acre. Dry straw or dry hay shall be applied (at the rate indicated in item 1 above) after hydraulic seeding.
3. One thousand pounds of wood cellulose or wood pulp fiber, which includes a tackifier, shall be used with hydraulic seeding on slopes 3/4:1 or steeper.
4. Sericea lespedeza hay containing mature seed shall be used at a rate of three tons per acre.
5. Pine straw or pine bark – Shall be applied at a thickness of 3 inches for bedding purposes. Other suitable materials in sufficient quantity may be used where ornamentals or other ground covers are planted. Pine straw or pine bark shall not be used on seeded areas.
6. When using temporary erosion control blankets or block sod, mulch is not required.
7. Bituminous treated roving may be applied on planted areas on slopes, in ditches or dry waterways to prevent erosion. Bituminous treated rowing shall be applied within 24 hours after an area has been planted. Application rates and materials must meet Georgia Department of Transportation specifications.

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

- J. Applying Mulch: Straw or hay mulch shall be spread uniformly using blower-type spreading equipment, other spreading equipment or by hand within 24 hours after seeding and/or planting. Approximately 75 percent of the soil surface shall be covered. Wood cellulose or wood fiber mulch shall be applied uniformly with hydraulic seeding equipment.
- K. Anchoring Mulch: Straw or hay mulch shall be anchored immediately after application by one of the following methods:
  1. Hay and straw: The hay or straw mulch shall be pressed into the soil immediately after it is spread. Special “packer disks” or disk harrows that are 20 inches or more in diameter, set straight, 8 to 12 inches apart, and with smooth or serrated edges shall be used. The edges of the blade shall be dull enough to press the mulch into the ground without cutting it, leaving much of it in an erect position. Mulch shall not be plowed into the soil.

2. Synthetic tackifier or binder: Synthetic tackifier or binders approved by GDOT shall be mixed according to the manufacturer's specifications and applied in conjunction with or immediately after the mulch is spread. For tackifiers and binders specifications refer to the latest edition of the Manual for Erosion and Sediment Control in Georgia.
  3. Rye or wheat: To stabilize the mulch, rye or wheat can be included with the Fall and Winter plantings. They shall be applied at a rate of one-half to one-quarter bushel per acre.
  4. Plastic mesh or netting: Plastic mesh or netting may be needed to anchor straw or hay mulch on unstable soils and areas receiving concentrated flow. The mesh or net openings shall be no larger than one inch by one inch. These materials shall be installed and anchored according to manufacturer's specification.
- L. Bedding Material: Mulch shall be used as a bedding material to conserve moisture and control weeds in ornamental beds, around shrubs, and on bare areas on lawns.
  - M. Irrigation: Irrigation shall be applied at a rate that will not cause runoff and erosion.
  - N. Topdressing: Topdressing shall be applied on all temporary and permanent (perennial) species planted alone or in mixtures with other species. For recommended rates of application see the Fertilizer Requirements table in latest edition of the Manual for Erosion and Sediment Control in Georgia.
  - O. Second Year and Maintenance Fertilization: For recommended second year fertilizer rates and maintenance fertilizer see the Plants, Planting Rates, and Planting Dates for Permanent Cover table in the latest edition of the Manual for Erosion and Sediment Control in Georgia.
  - P. Lime Maintenance Application: One ton of agricultural lime shall be applied every 4 to 6 years or as indicated by soil tests.

#### **8.12.7 Use and Management**

Mowing shall not take place during quail nesting season, between May and September. *Sericea lespedeza* shall be mowed only after the seeds have become mature. Mowing shall occur only after frost, between November and March. Bermudagrass, Bahiagrass and Tall Fescue shall be mowed as desired. At least 6 inches of top growth shall be maintained under any use and management. Moderate use of top growth is beneficial after establishment.

## **8.13 DISTURBED AREA STABILIZATION (WITH SOD)**

### **8.13.1 Definition**

A permanent vegetative cover using sods on highly erodible or critically eroded lands.

### **8.13.2 Purpose**

The purpose of using sod is to establish immediate ground cover, reduce runoff and erosion, improve aesthetics and land value, reduce dust and sediments, stabilize waterways and critical areas, filter sediments, nutrients and bugs, reduce downstream complaints, reduce the likelihood of legal action, reduce the likelihood of work stoppage due to legal action, and increase “good neighbor” benefits.

### **8.13.3 Conditions Where Practice Applies**

This application is appropriate for areas which require immediate vegetative covers, drop inlets, grass swales and waterways with intermittent flow.

### **8.13.4 Planning Considerations**

Sod can initially be more costly than seeding, but the advantages justify the increased initial costs.

Advantages are:

- A. Immediate erosion and sediment control, green surface, and quick use.
- B. Reduced failure as compared to seed as well as the lack of weeds.
- C. Can be established nearly year-round.

Sod is preferable to seed in waterways and swales because of the immediate protection of the channel after application. Sod must be staked in concentrated flow areas (see Figure M-13).

### **8.13.5 Construction Specifications**

- A. Soil Preparations: The soil surface shall be brought to final grade. The soil surface shall be cleared of trash, woody debris, stones and clods larger than 1”. The sod shall be applied to soil surface only and not frozen surfaces, or gravel type soils. Topsoil, which has not recently been treated with herbicides or soil sterilants, may be applied to help guarantee a good stand.

Fertilizer shall be mixed into the soil surface at a rate indicated by soil tests. Agricultural lime shall be applied based on soil tests or at a rate of 1 or 2 tons per acre.

- B. Installation: The sod shall be laid with tight joints and in straight lines. The joints shall be staggered and not overlapping. On slopes steeper than 3:1 the sod shall be anchored with pins or other approved methods (See Figure M-13).

After installation, the sod shall be rolled or tamped to insure good contact between sod and soil. The sod and underlying soil shall be irrigated to a depth of 4 inches immediately after installation. Irrigation shall also be used to supplement rainfall for a minimum of 2-3 weeks.

#### **8.13.6 Materials**

Sod shall be certified and selected from a source that is grown in the general area of the project.

- A. Sod shall be machine cut and contain  $\frac{3}{4}$ " (+ or -  $\frac{1}{4}$ ") of soil.
- B. Sod shall be cut to the desired size within + or - 5%. Torn or uneven pads shall be rejected.
- C. Sod shall be cut and installed within 36 hours of digging.
- D. Planting shall be avoided when there is a threat of frost or hot weather if irrigation is not available.
- E. The sod type shall be shown on the plans and installed according to the Sod Planting Requirements table in the latest edition of the Manual for Erosion and Sediment Control in Georgia.

#### **8.13.7 Maintenance**

Areas where adequate stands of sod are not obtained shall be re-sodded. New sod shall be mowed sparingly. The grass height shall not be cut less than 2"-3". Fertilizer shall be applied at a rate indicated by soil tests. Agricultural lime shall be applied based on soil tests or at a rate of one ton per acre every 4 to 6 years.

### **8.14 EROSION CONTROL MATTING AND BLANKETS**

#### **8.14.1 Definition**

A protective covering (blanket) or soil stabilization mat used to establish permanent vegetation on steep slopes, channels or shorelines.

#### **8.14.2 Purpose**

The purpose of erosion control matting and blankets is to provide a microclimate which protects young vegetation and promotes its establishment and to reinforce the turf to resist

forces of erosion during storm events.

### **8.14.3 Conditions Where Practice Applies**

Matting and blanket shall be applied on steep slopes where the hazard of erosion is high and planting is likely to be too slow in providing adequate protection cover. In concentrated flow areas, all slopes steeper than 2.5:1 and with a height of ten feet or greater, and cuts and fills within the stream buffer, shall be stabilized with the appropriate erosion control matting or blanket. On streambanks where moving water is present, matting can prevent new plantings from being washed away.

### **8.14.4 Planning Considerations**

- A. Temporary Erosion Control Blankets: includes temporary “combination” blankets (rolled erosion control blankets – RECB) consisting of a plastic netting which covers and is intertwined with a natural organic or manmade mulch; or a jute mesh which is typically homogeneous in design and can act alone as a soil stabilization blanket.

Temporary blankets as a minimum shall be used to stabilize concentrated flow areas with a velocity less than 5 ft/sec and slopes 2.5:1 or steeper with a height of 10 feet or greater. Temporary blankets will deteriorate in a short period of time and provide no enduring erosion protection.

Benefits of using erosion control blankets include the following:

1. Protection of seed and soil from raindrop impact and subsequent displacement
2. Thermal consistency and moisture retention for seedbed areas.
3. Stronger and faster germination of grasses and legumes.
4. Planing off excess stormwater runoff.
5. Prevention of sloughing of topsoil added to steeper slopes.

- B. Permanent Erosion Control Matting: consists of permanent non-degradable, three-dimensional plastic structures, which can be filled with soil prior to planting. These mats are also known as permanent soil reinforcing mats (turf reinforcement matting). Roots penetrate and become entangled in the matrix, forming a continuous anchorage for surface growth and promoting enhanced energy dissipation. Matting shall be used when a vegetative lining is desired in stormwater conveyance channels where the velocity is between five and ten feet per second.

Benefits of using erosion control blankets include the following:

1. All benefits gained from using erosion control blankets.
2. Causes soil to drop out of stormwater and fill the matrix with fine soils which become the growth medium for the development of roots.
3. Acts with the vegetative root system to form an erosion resistant cover which resist hydraulic lift and shear forces when embedded in the soil within stormwater channels.

#### **8.14.5 Materials**

All blankets and matting materials shall be on the GDOT Qualified Products List (QPL #62 for blankets, QPL #49 for matting). All blankets shall be nontoxic to vegetation and to the germination of seed and shall not be injurious to the unprotected skin of humans. At a minimum, the plastic netting shall be intertwined with the mulching material/fiber to maximize strength and provide for ease of handling.

Temporary Blankets: Machine produced temporary combination blankets shall have a consistent thickness with the organic material evenly distributed over the entire blanket area. All combination blankets shall have a minimum width of 48 inches. Machine produced combination blankets include straw blankets, excelsior blankets, coconut fiber blankets, wood fiber blankets and jute mesh.

Permanent Matting: Permanent matting shall consist of a lofty web of mechanical or melt bonded polymer nettings, monofilaments, or fibers which are entangled to form a strong and dimensionally stable matrix. Polymer welding, thermal or polymer fusion, or the placement of fibers between two high strength, biaxially oriented nets bound securely together by parallel lock stitching with polyolefin, nylon or polyester threads are all appropriate bonding methods. Mats shall maintain their shapes before, during and after installation, under dry or water saturated conditions. Mats must be stabilized against ultraviolet degradation and shall be inert to chemicals normally encountered in a natural soil environment.

#### **8.14.6 Site Preparation**

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

#### **8.14.7 Staples**

The following are considered appropriate stapling and staking materials.

- A. Temporary Blankets: This includes straw, excelsior, coconut fiber, and wood fiber blankets. Staples shall be used to anchor temporary blankets. U-shaped wire (11 gauge or greater) staples with legs at least 6 inches in length and a crown of one inch or appropriate biodegradable staples can be used. Staples shall be of sufficient thickness for soil penetration without undue distortion.
- B. Permanent Matting: Sound wood stakes, 1 x 3 inches stock sawn in a triangular shape, shall be used. Depending on the compaction of the soil, select stakes with a length from 12 to 18 inches. U-shaped staples shall be 11 gauge steel or greater, with legs at a minimum of 8 inches in length and a 2 inch crown.

#### **8.14.8 Planting**

Lime, fertilizer, and seed shall be applied in accordance with seeding or other type of planting plan completed prior to installation of temporary combination blankets or jute mesh. For permanent mats, the area must be brought to final grade, plowed, limed, and fertilized. After the permanent mat has been installed and backfilled, the entire area shall be grassed.

#### **8.14.9 Maintenance**

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

### **8.15 SPECIFIC EROSION AND SEDIMENT CONTROL MEASURES**

#### **8.15.1 Overland Control Structures**

##### **8.15.1.1 Longitudinal Slopes**

- A. Diversions shall be installed as indicated in Figure M-4a. Where required, temporary diversions shall be installed as soon as possible following the clearing operation.
- B. Silt fences or hay bales shall be installed at the outlet end of diversions as indicated in Figure M-8a, Figure M-8b and Figure M-9 where vegetation is not sufficient to provide adequate filtration.
- C. Silt fences shall be installed as required at the bases of slopes adjacent to road and stream crossings.

### **8.15.1.2 Side Hill Runoff Control Measures**

- A. Excavation operations shall be used to create swales/berms on the downhill side of the construction disturbance limits whenever necessary in conjunction with silt fences or hay bales in order to intercept runoff.
- B. Discharge points shall be protected with silt fences and/or hay bales.
- C. Silt fences and/or hay bales shall be installed at the downstream side of the right-of-way directly across (perpendicular to flow) small swales servicing small drainage basins.
- D. Silt fences and/or hay bales shall be installed along swales and intermittent stream bank (parallel with flow) when the stream is serviced by a larger drainage basin.
- E. Silt fences or hay bales shall be installed along the downgradient side of the disturbed area upslope of any stream, lake, or pond which is adjacent to or parallel to the construction right-of-way. As much width as possible of natural vegetation shall be maintained (as a filter strip) between the edge of clearing and the edge of the water body. Silt fences and/or hay bales shall be required in all cases where the limits of the disturbed area extend to within the following distances of streams, ponds, or other areas to be protected:

<u>Length of Vegetative</u> <u>% Slope</u>	<u>Filter Strip</u>
< 15%	50 ft.
15 – 30%	75 ft.
>30%	100 ft.

### **8.15.2 Temporary Stream Crossings**

#### **8.15.2.1 Staging Areas**

- A. Staging areas shall be located at least 50 feet back from the stream bank, where topographic conditions permit.
- B. The size of the staging areas shall be limited to the minimum needed for storage and prefabrication of construction material/equipment for stream crossings.
- C. Chemicals, fuels, lubrication oils, or refuel construction equipment shall not be stored within 100 feet of the stream bank.

#### **8.15.2.2 Spoil Pile Placement/Control**

- A. Trench spoil shall be placed beyond the limits of stream banks at all stream crossings.



- B. Spoil piles located beyond the limits of stream banks shall be protected with silt fences and/or hay bales.
- C. Spoil material shall not be stored along stream banks where it could be washed away by high stream flows.
- D. Where possible, spoil material or other soils on site shall be used to create small embankments/berms or other measures which control the direction and velocity of overland flow.

#### **8.15.2.3 Crossing Procedures**

All stream crossings shall provide means for passage of aquatic life forms. Either shoal type (overflow) crossings or bridge or culvert crossings (dry traffic surface with the flow passage opening beneath) are acceptable. In no event will the City approve a crossing (for example, of porous limerock base) which relies on seepage as a method for passing stream flow (seepage is not capable of providing acceptable passage for aquatic biota).

- A. Crossings shall be constructed as nearly perpendicular to the axis of the stream channel as engineering and routing conditions permit. The City shall be provided a set of drawings in advance of construction and a monthly notification during construction indicating the location (stationing) where construction, including stream crossings, is projected to occur in the coming monthly period.
- B. The pipe size shall be large enough to convey the full bank flow of the stream without appreciably altering the stream flow characteristics (see Table M-7). The structure shall be designed to withstand flows from a 10-year, 24-hour frequency storm or other storm specified in Title 12-7-1 of the Official Code of Georgia Annotated. Structures shall be protected from washouts by elevating the bridges above adjacent floodplain lands, crowning of the fill over the pipes or by use of diversions, dikes or island type structures.

<b>Table M-7 Pipe Diameters (inches) for Stream Crossings<sup>a</sup></b>				
<b>Contributing Drainage Area (acres)</b>	<b>Average Slope of Watershed</b>			
	<b>1%</b>	<b>4%</b>	<b>8%</b>	<b>16%</b>
1 – 25	24	24	30	30
26 – 50	24	30	36	36
51- 100	30	36	42	48
101 – 150	30	42	48	48
151 – 200	36	42	48	54
201 – 250	36	48	54	54
251 – 300	36	48	54	60
301 – 350	42	48	60	60
351 – 400	42	54	60	60
401 – 450	42	54	60	72
451 – 500	42	54	60	72
501 – 550	48	60	60	72
551 – 600	48	60	60	72
601 – 640	48	60	72	72

<sup>a</sup> Assumptions for determining the table: USDA-NRCS Peak Discharge Method CN=65; rainfall depth (average for Georgia) = 3.7" for 2-year frequency.

Source: Manual for Erosion and Sediment Control in Georgia, 2000, Georgia Soil and Water Conservation Commission.

C. Minor streams: <15 feet wide or <2 feet average depth.

1. Timber rip-rap (covered with geotextile fabric and soil) providing vehicle access across stream shall be used.
2. In-stream equipment shall be limited to that needed to construct the crossing.
3. In-stream trenching and backfill work shall be completed within 72 hours whenever feasible.

D. Major streams: >15 feet wide but <100 feet wide

1. Optional methods to be used in providing vehicle access across streams include:
  - a. Equipment and/or timber pads and culvert.
  - b. Clean rockfill shoal crossing.
  - c. Flexi-float or portable bridge.
2. In-stream equipment shall be limited to that needed to construct the crossing.

3. In-stream trenching and backfill work shall be completed within 72 hours whenever feasible.
- E. Rivers: >100 feet wide
1. Size criteria based on:
    - a. Inability to cross using culvert bridge.
    - b. Inability to store trench spoil on riverbank.
  2. Site-specific construction procedures shall be submitted to the City for review and approval prior to initiation of any construction at crossing.
- F. All culvert, bridges, rock, and timber riprap shall be removed from streams and rivers during final clean up and restoration.

### **8.15.3 Trench Dewatering**

- A. Trenches shall be dewatered into upland areas in such a manner that no silt laden water flows directly into any surface waters.
- B. Silt laden water shall be discharged through a functional siltation barrier (hay bales or silt fencing) or a minimum of 100 linear feet of vegetated area before entering streams or other surface waters.

### **8.15.4 Wetland Crossings**

#### **8.15.4.1 Staging Areas**

- A. Staging areas shall be located at least 50 feet from wetland edge, where topographic conditions permit.
- B. The size of staging areas shall be limited to the minimum needed for wetland crossing.
- C. Chemicals, fuel, lubrication oils, or refuel construction equipment shall not be stored within 100 feet of the stream bank. Appropriate spill prevention and control measures shall be implemented.

#### **8.15.4.2 Spoil Pile Placement/Control**

- A. Spoil material shall be placed beyond the edge of a wetland.
- B. Spoil piles shall be protected with silt fences and/or hay bales.

- C. Spoil material shall not be stored near the edge of a wetland where it could be washed away into the wetland.

#### **8.15.4.3 Crossing Procedures**

- A. If a wetland cannot be avoided and must be crossed, the utility shall be routed in a manner that minimizes the length of wetland crossing and disturbances.
- B. Tree stumps, or brush rip-rap shall not be used to stabilize the utility right-of-way.
- C. Clearing of right-of-way shall be limited to 30 feet wherever possible.
- D. Vegetation shall be cut off only at ground level, leaving existing root systems intact. Cut vegetation shall be removed from wetlands for disposal.
- E. Pulling of tree stumps and grading activities shall be limited to directly over trenches; stumps or root systems shall not be removed from non-trenched portions of the right-of-way in wetlands.
- F. Construction equipment operating in wetland shall be limited to that needed to dig trench, install pipe, backfill trench, and restore the right-of-way.
- G. Construction equipment shall be operated off of timber or wooden equipment pads if standing water or saturated soils are present.
- H. All timber or wooden equipment pads shall be removed upon completion of construction.
- I. “Push-pull” or “float” technique shall be used to place pipe in trench whenever water and other site conditions allow.

#### **8.16 TUNNELING**

All sewers or utilities that can be tunneled under the stream or the Greenway System must meet the following requirements:

- A. At stream crossings, the crown of the pipe must be at least 3 feet below the stream or waterbody bed.
- B. For sanitary sewers the pipe material must be ductile iron or reinforced concrete.
- C. For water mains the pipe material must be ductile iron.
- D. Excavation pits shall be located outside the Greenway System.

Each tunnel crossing must be evaluated individually. The designer must take into account stream width, flow conditions, soil conditions, and other factors in designing a proper tunnel. The design plans for tunneling under the Greenway System must be submitted to the City for approval before construction can begin.

## **9.0 SELECTED REFERENCES**

- A. Atlanta, Georgia. Stormwater Management Design Manual. Atlanta, 1996.
- B. Atlanta, Georgia. Atlanta Sewer Group (Montgomery Watson). "Collection and Transmissions Systems Maintenance Management Plan (MMP)." Atlanta, 2000.
- C. Georgia Power Company. "Distribution and Network Underground Requirements – Erosion and Sedimentation Control."
- D. Georgia Power Company. "General Operating Procedures of Georgia Power Forestry and R/W Services."
- E. Georgia. Soil and Water Conservation Commission. Manual for Erosion and Sediment Control in Georgia. 5<sup>th</sup> edition. 2000.
- F. Georgia. Soil and Water Conservation Commission. Guidelines for Streambank Restoration. 1994.
- G. North Carolina. Department of Environment and Natural Resources, Division of Water Quality, Water Quality Section. Storm Water Best Management Practices. 1999.
- H. Rosgen, Dave. Applied River Morphology. Pagosa Springs: Wildwood Hydrology, 1996.
- I. Schueler, Tom. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs. Washington: Metropolitan Washington Council of Governments, 1987.
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# **APPENDIX N**

## **CITY OF ATLANTA GREENWAY ACQUISITION PROJECT**

### **STANDARD OPERATING PROCEDURES FOR MAINTENANCE OF EXISTING UTILITIES WITHIN THE GREENWAY SYSTEM**

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## **1.0 INTRODUCTION**

The following Standard Operating Procedures (SOPs) shall guide entities proposing to perform emergency or scheduled maintenance to existing utilities within the Greenway System. The purpose of these SOPs is to ensure that emergency and scheduled maintenance activities are performed in a manner consistent with the requirements of the Consent Decree and the Greenway Acquisition Plan.

This document presents SOPs for the following activities:

- A. Emergency maintenance to existing utilities within the Greenway System.
- B. Scheduled maintenance to existing utilities within the Greenway System.
- C. Restoration of Greenway Properties disturbed during emergency or scheduled maintenance to existing utilities.
- D. Scheduled maintenance of vegetation growing within existing utility easements within the Greenway System.

These SOPs are designed to minimize erosion and sedimentation within Greenway Properties by:

- A. Minimizing the quantity and duration of soil exposure during emergency or scheduled maintenance of existing utility systems
- B. Requiring the installation of and maintenance of erosion and sediment control measures during emergency or scheduled maintenance construction activities.
- C. Restoring disturbed properties by establishing vegetation immediately following completion of emergency or scheduled maintenance construction activities.

These SOPs do not replace existing utility-specific guidelines for emergency and scheduled maintenance of existing utilities or restoration of utility easements after maintenance activities, but do establish minimum requirements for such activities on Greenway Properties. These SOPs do not limit the City, or other responsible local government or agency, from imposing additional or more stringent requirements to control erosion and/or sediment.

As stated in Section VIII.D.2.m of the Consent Decree, “Any infrastructure for human activity within the Greenway Properties shall be designed and constructed with prevention of non-point source pollution as the primary consideration”. This does not mean that prevention of non-point source pollution is the sole consideration. This means that cost or other factors will not outweigh non-point source pollution prevention as the primary concern. Only safety design consideration shall be as important as non-point source pollution prevention.



## **2.0 EMERGENCY MAINTENANCE TO EXISTING UTILITIES WITHIN THE GREENWAY SYSTEM**

It is anticipated that circumstances may arise when emergency maintenance will need to be performed on an existing utility within the Greenway System. In emergency situations there is little time to plan, permit, or install erosion and sediment control measures before construction activities begin. However, if more than 24-hours are needed to complete the emergency maintenance activities, a permit or variance may be required. It is the responsibility of the entity performing the emergency maintenance to determine when and if a permit and/or variance is required. In the event that more than 24-hours are needed to complete the emergency maintenance activities, erosion and sediment control measures shall be installed as soon as possible, but no later than 24-hours from the beginning of the emergency maintenance activities. Best management practices (BMPs) for erosion and sediment control shall meet the minimum requirements established in Appendix M (Standard Operating Procedures for Construction of New Utilities) and the latest edition of the Manual for Erosion and Sediment Control in Georgia. Emergency maintenance activities are applicable in situations such as when repairs are needed for a sewer or water line break or a downed power line. Ultimately it is the responsibility of the entity performing the maintenance to determine what constitutes an emergency.

## **3.0 SCHEDULED MAINTENANCE TO EXISTING UTILITIES WITHIN THE GREENWAY SYSTEM**

The entity proposing to perform scheduled maintenance to an existing utility within the Greenway System shall be responsible for the preparation of a land disturbance plan which must include, at a minimum, an erosion and sediment control plan. The erosion and sediment control plan shall include specifications describing how erosion and sediment control will be maintained during the scheduled maintenance activities, including the BMPs to be implemented. BMPs for erosion and sediment control shall meet the minimum requirements established in Appendix M (Standard Operating Procedures for Construction of New Utilities) and the latest edition of the Manual for Erosion and Sediment Control in Georgia. A copy of the erosion and sediment control plan shall be kept on site at all times.

The City and other responsible local government or agency shall be notified before scheduled maintenance activities begin inside the Greenway System. The City and other responsible local government or agency may inspect the site to ensure that adequate erosion and sediment control measures are in place prior to construction, that adequate erosion and sediment control measures are maintained until the project is completed, and that the site has been restored to as close to its original condition as feasible once maintenance activities have been completed.

## **3.1 PERMITS, VARIANCES, AND PLANS**

It is the responsibility of the entity performing maintenance within the Greenway System to determine what permits, plans, or variances are required for maintenance activities. For

example, the State of Georgia may have requirements under their General Storm Water Permit Program or Fulton County may require a Stream Buffer Variance and a Land Disturbance Activity Permit. Requirements may vary from one jurisdiction to another. Therefore, it is imperative that the entity performing the maintenance has a clear understanding of local requirements.

### **3.1.1 State of Georgia General Storm Water Permitting**

At the time of the writing of this document, construction projects that are five (5) acres or larger in size require coverage under the State of Georgia NPDES, General Permit GAR100000, for authorization to discharge storm water associated with construction activities. One of the construction activities this permit authorizes is the discharge of storm water associated with construction activities from linear construction that will result in the disturbance of more than five (5) acres. As stated in the permit “‘Linear Construction’ or ‘Linear Construction Project’ means construction activities that are not part of a common development and where the length of the project is at least 25 times longer than the width of the project and the construction activity is being conducted by the Georgia Department of Transportation, by a local government, or by a utility company or utility contractor”. It is the responsibility of the entity performing the maintenance to determine if they need to apply for coverage. Application is made by submittal of a Notice of Intent (NOI) and a permit fee to:

Northwest Georgia Regional Office  
Georgia Environmental Protection Division  
Suite 114  
4220 International Parkway, Suite 101  
Atlanta, GA 30354  
Telephone (404) 675-6240

The NPDES general construction permit requires the use of Best Management Practices (BMPs) to control stormwater runoff for all rainfall events up to and including a 25-year 24-hour rainfall event. BMPs used shall be consistent with, and no less stringent than, those practices contained in the Manual for Erosion and Sediment Control in Georgia published by the State Soil and Water Conservation Commission as of January 1 of the year in which the land-disturbing activity is permitted. For some sites, additional BMPs beyond those identified in the Manual may be necessary for erosion and sediment control for all rainfall events up to, and including, a 25-year 24-hour rainfall events.

To ensure compliance with State water quality standards, the general permit requires inspections of the construction site as well as sampling and analysis of stormwater runoff from the site. The permit also requires daily recording of on-site precipitation. Detailed requirements for inspection and sampling are provided in the general permit. The guidelines set forth in this document and the latest edition of the Manual for Erosion and Sediment Control in Georgia will be used in conjunction with the State general permit to ensure that the best possible procedures are used for erosion and sediment control.

### **3.1.2 Stream Buffer Variance**

The State of Georgia Environmental Protection Division (EPD) enforces minimum stream buffer requirements. At the time of the writing of this document the EPD's requirements prohibit construction activities within a 25-foot buffer along the banks of all state waters or within a 50-foot buffer along the banks of any state waters classified as 'trout streams' (the State of Georgia Department of Natural Resources maintains the most current stream classifications). The Director of the EPD may grant a variance that is at least as protective of natural resources and the environment as provisions described in Title 12-7-6 of the Official Code of Georgia Annotated. The Director of the EPD may also grant a variance where a drainage structure or a roadway drainage structure must be constructed, provided that adequate erosion and sediment control measures are incorporated in the project plans and specifications and are implemented during construction. The buffer distance is measured horizontally from the point where vegetation has been wrested by normal stream flow or wave action. It is the responsibility of the entity performing the maintenance to determine if a variance is required from the State of Georgia, the City, or other responsible local government or agency.

### **3.1.3 Land Disturbance Activity Permits (LDP)**

It is the responsibility of the entity performing the maintenance within the Greenway System to determine if a Land Disturbance Activity Permit is required from any authority having jurisdiction. A Land Disturbance Activity Permit may contain the following information:

- A. Name, address, and contact telephone number.
- B. Narrative description of the maintenance activities to be conducted.
- C. Description of BMPs to be used.
- D. A site map.
- E. An activity schedule.
- F. Supportive data.
- G. Plans and specifications for restoring the site to a natural state with permanent vegetation.

The entity performing the maintenance shall contact the City and other responsible local government or agency for specific Land Disturbance Activity Permit requirements.

## **3.2 SITE CLEARING**

The following SOPs shall be followed during the site clearing phase for scheduled maintenance projects within the Greenway System:

- A. All cut and fill activities occurring within the EPD's mandated 25-foot stream buffer (50-foot buffer for trout streams) shall be stabilized with appropriate erosion control matting and blankets.
- B. The area to be cleared shall be clearly delineated to ensure that no disturbance occurs beyond the area identified. Except for perpendicular utility crossings, any open cut, grading, or clearing shall be set back from the streambanks to the greatest distance feasible. Except for manholes, portals, and the maintenance access to such facilities, the Greenway System must remain in a natural state even where crossings are perpendicular to the stream. Where feasible, scheduled utility maintenance projects are recommended to have no more than a thirty-foot (30') construction width (for projects paralleling the stream).
- C. Vegetation to be preserved shall be identified and clearly marked by flagging before clearing begins. Vegetation to be preserved shall include: vegetation vital to streambank stabilization; vegetation providing food and/or habitat to a federally listed endangered species, threatened species, or species of concern; vegetation that is a federally listed endangered species, threatened species, or species of concern; and vegetation that comprises a wetland ecosystem.
- D. Stemmed vegetation such as brush, shrubs, and trees shall be removed at or near the ground level, leaving the root systems intact.
- E. When pruning is necessary to clear the scheduled maintenance construction area, pruning cuts shall be made in accordance with the International Society of Arboriculture (ISA) Standards.
- F. Trees shall be felled into the cleared construction area or areas to be cleared and not onto vegetation to be preserved.
- G. Trees, which have fallen into water bodies or beyond the construction area, shall be removed immediately.

## **3.3 EROSION AND SEDIMENT CONTROL**

### **3.3.1 Maintenance Project Planning and Preliminary Grading**

Efforts shall be made during initial planning and whenever possible during scheduled maintenance phases, to minimize the amount of area cleared and graded (exposed) as well as the total exposure time. Plans must consider topography and soil type, so as to create the lowest practicable erosion potential. Whenever feasible, preliminary grading

operations shall be used to control the flow direction and velocity of runoff water and thereby dissipate energy. Where feasible, swales and diversion berms shall be used to direct runoff water to locations where treatment by sediment barriers can be performed. Where feasible, transverse diversion berms, installed perpendicular to the flow of water down slopes and in drainage channels, shall be used to reduce runoff water velocity. Cleared slopes shall be harrowed with construction equipment to create small diversion channels along the contours of the slope perpendicular to the direction of runoff flow. This action not only reduces flow velocities of runoff water traveling down the slopes, but also reduces flow quantities by increasing the area of exposed soil and thus enhancing percolation of runoff water. Grading equipment shall cross flowing streams by the means of bridges or culverts, except when such methods are not feasible, provided in any case that such crossings shall be kept to a minimum.

Dust from the disturbed area shall be controlled. Temporary means for controlling dust shall include mulching or vegetative cover with temporary seeding (see the latest edition of the Manual for Erosion and Sediment Control in Georgia). Emergency means for controlling dust shall include tillage or irrigation.

### **3.3.2 Erosion and Sediment Control Practices**

Erosion and sediment control practices must be implemented prior to any land disturbing activities resulting from scheduled maintenance within the Greenway System. Control of factors affecting erosion and sediment can be provided by a number of basic practices. The establishment of a dense stand of vegetation is probably the most effective means of controlling erosion and sediment; however, this control measure is often not practical until the completion of a project. Prior to and during the scheduled maintenance of utilities within the Greenway System, temporary erosion and sediment control measures shall be implemented and maintained until the construction area is restored as described later in this document.

Soft engineering techniques shall be used for erosion and sediment control. Hard engineering techniques shall only be used after soft techniques have failed and the failure is due to the inability of soft techniques to address the erosion problem. Improper choice of soft engineering techniques or improper design, implementation, and/or maintenance shall not be justification to turn to hard engineering techniques.

Appendix M presents summaries of techniques, (including their applications) used to control erosion and sedimentation. Erosion and sediment control measures shall be designed and implemented in accordance with the design standards established in Appendix M and the latest edition of the Manual for Erosion and Sediment Control in Georgia. If a conflict occurs between the design and construction standards presented in this document and those presented in the latest edition of the Manual for Erosion and Sediment Control in Georgia, the more stringent design and construction standards shall prevail. The selection of the most appropriate erosion and sediment control measure will be made by the entity performing scheduled maintenance to a utility on Greenway Property based on site specific conditions.

### **3.4 CONSTRUCTION METHODS**

After all appropriate erosion and sediment control measures have been installed, the designated scheduled maintenance project can proceed as approved by the City with recommendations from any other responsible local government or agency. All clearing work and construction operations shall be conducted in such a manner as to effectively control soil erosion and prevent non-point source pollution loads from entering streams, ponds, and/or wetlands. At any time during the scheduled maintenance project, the City, with recommendations from any other responsible local government or agency, has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow, and fill operations and to direct the entity performing work on Greenway Properties to provide immediate permanent or temporary erosion and sediment control measures to prevent adverse impacts to wetlands or water courses on the Greenway Property.

Prohibited construction procedures include, but are not limited to, the following:

- A. Dumping of spoil material into any streams, wetlands, surface waters, or unspecified locations.
- B. Indiscriminate, arbitrary, or capricious operation of equipment in wetlands or surface waters.
- C. Pumping of silt-laden water from trenches or excavations into surface waters or wetlands.
- D. Damaging vegetation adjacent to or outside of the construction area limits.
- E. Disposal of trees, brush, debris, plants, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in wetlands, surface waters, or unspecified locations.
- F. Alteration of the flow line of any stream, unless such work is of a temporary nature, has been specifically authorized by the authority having jurisdiction, and is necessary to divert flow from excavation work so that debris and sediments are not released into streams.
- G. Open burning of debris within Greenway properties.

All conveyance channels, drainage outlets, and erosion and sediment control measures must be constructed to withstand the expected velocity of flow from a 25-year frequency storm without erosion.

#### **4.0 RESTORATION OF THE GREENWAY PROPERTIES AFTER EMERGENCY OR SCHEDULED MAINTENANCE TO EXISTING UTILITIES**

Permanent soil stabilization measures shall be applied to disturbed areas within 30 days after all soil disturbing activities have been completed and the final grade has been reached on any portion of the construction project site. Permanent soil stabilization means that for unpaved areas and areas not covered by permanent structures, at least 70% of the soil surface is uniformly covered in permanent vegetation or equivalent permanent stabilization measures (such as the use of riprap, gabions, permanent mulches, or geotextiles) have been employed. Until these conditions are satisfied and permanent control measures and facilities are operational, interim stabilization measures and temporary erosion and sediment control measures shall not be removed. Efforts shall be made to return the site to its natural condition. Native vegetation shall be used in such efforts. Acceptable plants and grasses are listed in Section 5.0 of this document and the latest edition of the Manual for Erosion and Sediment Control in Georgia.

Temporary soil stabilization measures shall be applied immediately to disturbed areas that are not at final grade but shall remain dormant for longer than 60 days. Areas that have been stabilized by temporary measures must be permanently stabilized once all soil disturbing activities are complete and the area is at final grade. Also, permanent stabilization measures shall be applied immediately to rough graded areas that will require erosion and sediment control for longer than six months.

#### **4.1 PERMANENT VEGETATION**

Permanent vegetation is the planting of perennial vegetation such as trees, shrubs, vines, grasses, or legumes, on exposed areas for permanent soil stabilization. A crop of perennial vegetation appropriate for the region which is capable of providing a 70% coverage within the growing season shall be used to achieve permanent soil stabilization.

The purpose of establishing permanent vegetation in disturbed areas is to protect the soil surface from erosion, reduce damage from sediment, reduce runoff to downstream areas, improve wildlife habitat and visual resources, and improve aesthetics. Permanent soil stabilization applies to each phase of construction. For linear construction projects on land used for agricultural or silvicultural purposes, permanent stabilization may be accomplished by stabilizing the disturbed land for its agricultural or silvicultural use. For design and construction specifications for disturbed area stabilization with permanent vegetation see Appendix M and the latest edition of the Manual for Erosion and Sediment Control in Georgia.

Sod shall be used to establish a permanent vegetative cover on highly erodible or severely eroded lands. Sod establishes immediate ground cover and thereby reduces runoff, erosion, and dust, which results in improved aesthetics; higher land values; stabilized waterways and critical areas; less sediments, nutrients and bugs; less downstream complaints; reduced likelihood of legal action and work stoppage due to legal action; and increased “good neighbor” benefits.

Sod is appropriate for areas that require immediate vegetative covers such as drop inlets, grass swales, and waterways with intermittent flow. Sod can initially be more costly than seed, but the advantages justify the increased initial costs.

The advantages to sod include the following:

- A. Immediate erosion and sediment control, green surface, and quick use.
- B. Reduced failure as compared to seed.
- C. Lack of weeds.
- D. Can be established almost year-round.

Sod is preferable to seed in waterways and swales because of the immediate protection of the channel after application. Sod must be staked in concentrated flow areas. For design and construction specifications for disturbed area stabilization with permanent sod see Appendix M and the latest edition of the Manual for Erosion and Sediment Control in Georgia.

## **4.2 EROSION CONTROL MATTING AND BLANKETS**

This stabilization technique provides a protective covering (blanket) or a soil stabilization mat to establish permanent vegetation on steep slopes, channels, or shorelines. The purpose of erosion control matting and blankets is to provide a microclimate that protects young vegetation and promotes its establishment and to reinforce the turf against forces of erosion during storm events.

Matting and blankets shall be applied on steep slopes where the hazard of erosion is high and planting is likely to be too slow in providing adequate protective cover. Concentrated flow areas, slopes steeper than 2.5:1 and with a height of ten feet or greater, and cuts and fills within the stream buffer, shall be stabilized with the appropriate erosion control matting or blanket. On streambanks where moving water is present, matting can be used to prevent new plantings from being washed away. For design and construction specifications for erosion control using matting and blankets see Appendix M and the latest edition of the Manual for Erosion and Sediment Control in Georgia.

Benefits of using erosion control blankets include the following:

- A. Protection of seed and soil from raindrop impact and subsequent displacement.
- B. Thermal consistency and moisture retention for seedbed areas.
- C. Stronger and faster germination of grasses and legumes.
- D. Planing off excess stormwater runoff.



- E. Prevention of sloughing of topsoil added to steeper slopes.

Benefits of using erosion control matting include the following:

- A. All benefits gained from using erosion control blankets that are listed above.
- B. Collects soil out of stormwater which becomes the growth medium for the development of roots.
- C. Assists the vegetative root system in forming an erosion-resistant cover resistant to hydraulic lift and shear forces when embedded in the soil of stormwater channels.

## **5.0 SCHEDULED VEGETATIVE MAINTENANCE ON EXISTING UTILITY EASEMENTS WITHIN THE GREENWAY SYSTEM**

It is the responsibility of the entity owning a utility easement on Greenway Property to determine if a permit is required to trim vegetation from the easement. Vegetation shall be trimmed in a manner to insure that at least six (6) inches of top growth shall be maintained under any use and management. The following SOPs shall be followed during scheduled vegetative maintenance of existing utility easements within the Greenway System:

- A. The area to be trimmed shall be clearly delineated to ensure that no disturbance occurs beyond the area identified. Trimming of vegetation along the existing utility easement is suggested to have no more than a twenty-foot (20') width (for utilities paralleling the stream).
- B. Vegetation that does not require trimming shall be identified and clearly marked by flagging before vegetative maintenance begins. Every effort shall be made to preserve the following: vegetation vital to streambank stabilization; vegetation providing food and/or habitat to a federally listed endangered species, threatened species, or species of concern; vegetation that is a federally listed endangered species, threatened species, or species of concern; and vegetation that comprises a wetland ecosystem.
- C. Stemmed vegetation such as brush and shrubs shall be trimmed leaving at least six (6) inches of growth. When removal of a tree cannot be avoided, it shall be removed at ground level, leaving the root system intact.
- D. When pruning is necessary during vegetative maintenance procedures, pruning cuts shall be made in accordance with International Society of Arboriculture (ISA) Standards.
- E. Trees, tree limbs, and other vegetative debris which have fallen into water bodies or beyond the utility easement area, shall be removed immediately.

- F. Mowing shall not take place during quail nesting season, between May and September. Sericea lespedeza shall be mowed only after the seeds have become mature. Mowing shall occur only after frost, between November and March. Bermudagrass, Bahiagrass and Tall Fescue shall be mowed as desired.

## **6.0 TRAINING OF PERSONNEL INVOLVED IN EMERGENCY AND SCHEDULED MAINTENANCE OF EXISTING UTILITIES WITHIN THE GREENWAY SYSTEM**

Key personnel involved in emergency and scheduled maintenance of existing utilities within Greenway Properties shall be trained in the requirements of the Consent Decree, the Greenway Acquisition Plan, and these SOPs. The key personnel shall also be trained on the proper installation, implementation, and inspection of erosion and sediment control measures.

A “pre-construction” meeting may be held between the City, other responsible local government or agency, and key personnel of the utility or construction agency following training in order to ensure that all parties have a common understanding as to how scheduled maintenance will be performed within the Greenway System.

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- D. Georgia Power Company. “Distribution and Network Underground Requirements – Erosion and Sedimentation Control.”
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- F. Georgia. Soil and Water Conservation Commission. Manual for Erosion and Sediment Control in Georgia. 2000.
- G. Georgia. Soil and Water Conservation Commission. Guidelines for Streambank Restoration. 1994.
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# **City of Atlanta**

**Department of Public Works  
Office of Transportation**

## **City's Public Right-of-Way Manual**

*Department of Public Works  
Office of Transportation  
Transportation Engineering  
October 2015*

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## **Part 1: Conflicts with City of Atlanta Code**

In the event that some details in this manual or any attachments or Appendix to it, is in conflict with the City's Code of Ordinances, the Code of Ordinances shall prevail. Refer to the City of Atlanta's Code of Ordinance. If there is a conflict between the Utility Franchise Agreement, Code of Ordinance and/or the Right-of-Way Manual, then the Franchise Agreement shall prevail.

## **Part 2: Purpose, Introduction, Definition and Legal Authority**

### **Section 1: Purpose of ROW Manual**

This manual is intended to serve as a reference anyone needing general information regarding activities conducted under a permit, franchise agreement or special agreement within the City's public right-of-way in the City of Atlanta ("City"). This manual is in its first edition and will be updated as necessary. It attempts to address typical issues and frequently asked questions. It does not include a discussion or information concerning every issue that may arise regarding the City's public right-of-way.

Additional Information Source: For additional information please contact:

Department of Public Works/Office of Transportation  
City Hall South  
55 Trinity Avenue SW, Suite 4900  
Atlanta, Georgia 30303  
Telephone 404-330-6501

### **Section 2: Definitions**

As used in this manual, the following terms will have the following definitions:

- a. Day: Each day shown on the calendar.
- b. Franchised Utility: A utility business entity that has entered into a Franchise Agreement with the City for the operation of its utility facilities within the City's public right-of-way. Franchised Utilities make regular franchise fee payments to the City for use of the City's public right-of-way, in accordance with the applicable Franchise Agreement.
- c. Governmental Regulations: All applicable federal, state or local statutes, laws, ordinances, codes, rules, regulations, standards, executive orders, consent orders, and guidance from regulatory agencies, judicial decrees, permits, licenses or other governmental requirements of any kind.
- d. MUTCD (*Manual on Uniform Traffic Control Devices*): <http://mutcd.fhwa.dot.gov/>  
The national standard for traffic control devices for all highways and streets open to public for travel which has been adopted by the State of Georgia and the City.
- e. Normal Transportation Purpose: The methods to provide an unencumbered way for travel by the public including pedestrians, vehicles and bicyclist, and to provide access to real property.
- f. Person: Any individual or any association, firm, partnership, joint venture, corporation or other legally recognized entity, whether for profit or not for profit. Person does not include the City.

- g. City's public right-of-way: Generally property of any interest therein, whether or not in the form of a strip, for or devoted to (a) public transportation purposes; or (b) the placement of the City's utility easements and other traditional uses along a transportation route, whether by dedication, prescription or otherwise, as well as the spaces above and below.
- h. Sidewalk: The paved portion of the City's public right-of-way intended for use by pedestrian traffic. Sidewalks are usually concrete or brick. Unusual or decorative sidewalks are permitted by special agreement.
- i. Street: The portion of the City's public right-of-way intended for use by vehicular traffic. Streets may be asphalt, concrete, or unimproved.
- j. Traveled Way: The portion of the City's public right-of-way reserved for vehicular traffic, exclusive of shoulders and auxiliary lanes.
- k. Encroachment: Unauthorized use of City's ROW or easements as for signs, fences, building, utilities, parking storage, etc...
- l. Penalty: A punitive measure imposed by the City for a violation of a provision of the City of Atlanta Code of Ordinance, ROW Manual and/or franchise agreement.
- m. Violation Notice: Written or verbal warning of an violation of the Code of Ordinance, ROW Manual or Franchise Agreement
- n. Encroachment Space: implies "advanced beyond proper limits."

### **Section 3: Introduction**

#### **a. General Purpose of City's public right-of-way**

City's public right-of-way was and is established for multiple public purposes. Their primary purpose (Normal Transportation) is to provide for pedestrian and vehicular transportation by the public.

#### **b. Applicable Governmental Requirements/Regulations**

Rules regarding the normal movement of pedestrian and vehicular traffic within the City's public right-of-way are contained in various governmental requirements, including the City's Code of Ordinances and the Georgia Uniform Traffic Code. It is not the intent of this manual to provide a discussion of these rules.

#### **c. Utility Location**

Another significant purpose of the City's public right-of-way is to provide a location for the installation of water, sewer, gas, electric power, telecommunications and other similar services and utilities.

#### **d. Address System**

City's public right-of-way provides for a system of organized and readily identifiable property addresses.

e. Regulation regarding Transportation

Any activity that may interfere with the Normal Transportation purpose or other public purpose of the City's public right-of-way is subject to further regulation by the City. Such regulation may be provided through a permit, franchise agreement, special agreement or any other mechanism recognized by applicable governmental requirements.

## **Section 4: Improved and Unimproved City's public right-of-way**

a. General

The boundaries and ownership of the land are recognized even if that land is "vacant". If a building or structure is built, the land is considered "improved". The improvement may be used or unused, occupied or unoccupied, well maintained or deteriorated.

b. Specific Improvements

City's public right-of-way may or may not be "improved" with a street (travel way), sidewalk or other facilities. It may or may not be graded, drained, or equipped with utilities. Nonetheless, the boundaries and ownership (the state or fact of exclusive rights and control over property) of the City's public right-of-way exist independent of any improvement or lack of any improvement. Ownership may be by fee, expressed dedication or easement.

c. Abandoned City's public right-of-way

1. Scope of Manual with regards to City's public right-of-way Abandonment

The specific terms, conditions, and methods of abandoning a City's public right-of-way under applicable governmental requirements are beyond the scope of this manual. *The City Code of Ordinances Section 138-9 [Vacating and Abandoning Streets](#)* outlines requirements for City's public right-of-way abandonment.

## **Section 5: Legal Authority and Reference Materials**

Pursuant to O.C.G.A 32-4-92, the City of Atlanta is authorized to promulgate rules and regulations regarding the management of its Rights-of-Way.

a. Legal Authority

The OGCA 32-4-92 authorizes the Commissioner of Department of Public Works to impose terms and conditions regarding the conduct and permitting of certain activities in the City's public right-of-way necessary to protect the public health and safety. The City Right-of-Way Manual is an administrative document developed to further outline the policies and procedures of the Department of Public Works.

b. Reference Manuals

The Department of Public Works has previously published documents that provide detailed technical information regarding specific issues. These include:

1. Sidewalks Rules and Regulation Governing Sidewalks
2. Standard Details

Department of Public Works Standard Details and the referenced publications are available from the Department of Public Works.

Information concerning sanitary and storm sewers can be obtained from the City's Watershed Management Department

### **PART 3: Penalties for Violation of City's public right-of-way Regulations**

#### **Section 1: Penalties for violation of City's public right-of-way Regulations**

With the exception of the franchised utilities, violators of the rules and regulations described in this manual may be subject to the penalties set forth in [138.4 Section \(Enforcement, Penalties, and Violations\)](#) of the City's Code of Ordinances. This section provides that, among other things, the violator may be subject to one or more of the following penalties:

- a. A Fine of up to \$1000.00 per day per violation
- b. The revocation or suspension of a license, permit or franchise agreement for access to the City's public right-of-way, subject to notice, and opportunity to cure and all other due process procedures as set forth in City of Atlanta Code of Ordinances Chapter 138 Article III, *et seq* and all other applicable agreements between the parties.
- c. A Person may appeal the revocation, suspension of a license, permit or franchise agreement for access to the City's public right-of-way to the Commissioner of Public Works.
- d. The issuance of a stop work order by the Department of Public Works preventing work on the Public Streets or Sidewalks, City's public right-of-way or any associated private projects in the City until the conditions outlined in the stop work order are met.
- e. Notwithstanding the foregoing, a stop work order issued by the City shall be the sole remedy available to the City in the event a franchised utility violates the rules described in this manual.

#### **Section 2: Legal actions against violators of City public right-of-way regulations**

The imposition of any of the foregoing penalties does not prevent the City from taking any other administrative or legal actions allowed under applicable regulations, or seeking any other relief that may be granted under applicable law.

### **Section 3: Repeated Violations**

- a. If a violation is continuous with respect to time, each day the violation continues may be treated as a separate offense.
- b. Violations that are continuous with respect to time are a public nuisance and may be abated by injunctive or other equitable relief and by such other means as are provided by law. The imposition of a penalty does not prevent equitable relief.
- c. In the event a violation is committed by a Franchise Utility Company, a stop work order will be issued in lieu of a citation.

### **Section 4: Enforcement**

Notice of Violation -If the City believes that a Person has not complied with the conditions of permit or a term in the Ordinance, the City shall notify the Person in writing of the exact nature of non-compliance. City Code of Ordinance ([138 Section](#) )

- a. Persons shall have the opportunity to respond to the Violation Notice contesting the assertion of non-compliance ; and
- b. Persons shall have the opportunity to cure the alleged non-compliant issue prior to the invocation of any penalties contained in the foregoing sections.

## **Part 4: Commercial Activity within the City's public right-of-way**

### **Section 1: Vending**

- a. Permit Required

Buying and selling goods within the City' public right-of-way is prohibited except by permit. Vending permits are issued and enforced by the City's Police Department, Licensing and Permits Unit.

- b. Blocking Right-of-Way Prohibited

Blocking a sidewalk when conducting an authorized, City permitted sale of goods is prohibited. A minimum passage way width of at least 4 feet must be maintained along the Sidewalk at all times.

### **Section 2: Vending Machines (food, drinks, etc.)**

Unattended vending machines or similar devices may not be located within the City's public right-of-way.

### **Section 3: Publication-Vending Devices (Newspaper Boxes)**

The placement of publication vending devices in the City's public right-of-way must be pursuant to the City Code Chapter 138

- a. Permit Required

It is unlawful for any Person to place, locate, or operate any publication-vending device on a Sidewalk or within any part of the City's public right-of-way without first obtaining a permit from the Commissioner of the Department of Public Works.

For information regarding the issuance of a permit, contact:

Department of Public Works/Office of Transportation  
City Hall South  
55 Trinity Avenue SW, Suite 4900  
Atlanta, Georgia 30303  
Telephone 404-330-6501

b. Identification

Every publication-vending device must display the name, address and telephone number of the Person responsible for its placement, maintenance, and repair.

c. Special Encroachment

Constructing, erecting, and maintaining any non-standard structure or facility within the City's public right-of-way will require a special agreement. Examples include, but are not limited to, street furniture, fountains, trash cans, recreation or playground equipment, kiosk, etc.

1. Encroachments into sidewalk and street

No publication-vending device may project onto, into or over any part of a street, or interfere with or impede the flow of pedestrian or vehicular traffic, including any legally parked or stopped vehicle, or any other lawful use of the applicable City's public right-of-way.

2. Obstruction

No publication-vending device may be located where it presents a dangerous condition or obstruction, or endangers the safety of persons or property, or unreasonably interferes with the entrance or access to any residence, business, utility pole, sign post, traffic sign or signal, fire hydrant, gas or water valve, mailbox or similar utility facility.

3. Multiple Publication-Vending Devices

Publication-vending devices may be placed next to each other, as long as no group of publication-vending devices extends more than 6 feet along a curb or wall, except in Olympic Corridors and in the Downtown Improvement District.

d. Affixation to Property

No publication-vending device may be chained or fastened to any property not owned by the owner of the publication-vending device or to any permanently fixed object. However, publication-vending devices, when placed side by side, may be chained or otherwise attached to one another.

e. Specifically Prohibited Locations

No publication-vending device may be located

1. Within 5 feet of any crosswalk;
2. Within 20 feet of any fire hydrant, fire call box or police call box;
3. Within 5 feet from any driveway;
4. In such a manner that impairs visibility for vehicular traffic;

5. In such a manner that impairs bus, taxicab, truck or passenger loading zones;
6. Within 15 feet of any designated bus stop sign or post;
7. Within 50 feet of any other publication-vending device on the same side of the street containing the same edition of the same publication;
8. At any location where the available area of unobstructed Sidewalk for the passage of pedestrians is reduced to less than 6 feet;
9. Within 2 feet of signs, parking meters, streetlights, or utility facilities;
10. In such a manner that hinders access to parked vehicles in marked parking stalls;
11. In a manner that blocks historic markers, benches, or other public improvements;
12. In any manner otherwise prohibited by applicable governmental requirements;
13. In any area where publication-vending device are prohibited by law;

f. Dimensions

No single publication-vending device may exceed 5 feet in height, 30 inches in width or 2 feet in thickness

g. Maintenance

Each publication-vending device must be maintained in a state of good repair at all times.

h. Abandoned Publication-Vending Devices

Any publication-vending device placed upon the City's public right-of-way that appears, in the sole determination of the City's Commissioner of its Department of Public Works or his/her designee, to have been unused in that location for at least 45 Days will be considered abandoned.

The abandoned publication-vending device will be subject to all removal or other remedial procedures provided for in the City's Code of Ordinances or other applicable governmental requirements.

i. Advertising

It is unlawful for any Person to use a publication-vending device for advertising or purposes other than information identifying the publications sold within the specific device.

Additional Requirements for Publication-Vending Devices in Olympic Corridors and the Downtown Improvement District:

1. Uniformity

Publication-vending devices must be uniform and standardized as per the City's Code of Ordinances.

2. Weight

Publication-vending devices must weigh a minimum of 75 pounds and may be fastened to one another in such a manner that they cannot be easily moved or toppled or otherwise pushed or thrown into a City's public right-of-way or Street.

3. Affixation to Sidewalk

Publication-vending devices may not be fastened to the Sidewalk without prior approval from the Commissioner of the City's Department of Public Works.

4. Groups of Publication-Vending Devices

Publication-vending devices must abut one another beginning at a location not less than 30 feet from the intersection point of the projected curb lines of any intersection. No group of publication-vending devices may extend for more than 13 feet. There must be a space of 50 feet between groups of publication vending devices.

5. Street Furniture Zone

Publication-vending devices must be placed within the Street furniture zone, as described by the pedestrian space plan (sheets 137 and 138 of the City's official zoning map), no closer than 18 inches from the back of the nearest curb of the Street and must be positioned to provide for a minimum of 9 feet of unobstructed Sidewalk, so as not to impede reasonable pedestrian traffic on the Sidewalk. Publication-vending devices will not be permitted on Sidewalks with a width of less than 12 feet.

#### **Section 4: Bus Shelters**

A Special Agreement is required to erect or maintain a bus shelter within the City's public right-of-way. Contact the Public Works, Traffic Operations Division for information. Refer to *City Code [138-43 Section](#)* for additional information.

#### **Section 5: Signs within the City's public right-of-way**

a. Prohibition

It is unlawful to affix (or cause to be affixed) any signage (including, but not limited to, any handbill, poster, paper, campaign sign, or other written or drawn communication) within the City's public right-of-way or to or upon any Sidewalk, crosswalk, curb, Street lamppost, hydrant, traffic signal control box, utility facilities, tree, stake, post or other structure located within the City's public right-of-way. Refer to City Code Section 138-13 for exceptions.

b. Signs on Private Property

Signs on private property (located outside of City's public right-of-way) are regulated by Sign Ordinance Code and other applicable governmental requirements, and are enforced by, among other Persons, the City's Department of Planning and Community Development.

c. Enforcement



The City of Atlanta Code of Ordinances designates the Department of Public Works as the entity to enforce requirements and penalties related to signs within the City's public right-of-way. Refer to City of Atlanta Code Section 138-4.  
(138 Section )

d. Removal

The City's Department of Public Works is authorized to remove signage in the right-of-way that violates the City's Code of Ordinances, or to require that it be removed. Refer to City of Atlanta Code Section 138-13.  
(138-43 Section )

e. Penalties

Any violator of this Section may be held accountable as provided in the penalty Section of the Code of Ordinances. The placement of each individual sign will constitute a separate violation.

## **Section 6: Utility Boxes within the City's public right-of-way**

- a. Utility Boxes may be constructed within the City's public right-of-way after obtaining the necessary permits.
- b. All efforts must be made to ensure the boxes are placed to minimize the impact to private property.
- c. In the event, the box will be placed in-front of a residential home, screening may be required by the City's Department of Public Works, to be installed and maintained by Licensee to ensure that the utility box conforms to its general surroundings.

## **Part 5: Permitted Construction within the City's public right-of-way**

### **Section 1: Additional Publications**

The City's Department of Public Works has previously published various documents outlining the rules, regulations, processes, and standards for various types of municipal construction. These publications include:

- a. Rules and Regulation Governing Sidewalks
- b. City of Atlanta Department of Public Work Standard Details.

These publications are available from:

Department of Public Works/Office of Transportation  
City Hall South  
55 Trinity Avenue SW, Suite 4900  
Atlanta, Georgia 30303  
Telephone 404-330-6501

### **Section 2: Authorized Contractor Registration**

Franchised Utilities are not subject to the subsequent provisions-See Part 7

- Contractors performing work under permits issued to Franchised Utilities will be covered under the terms of the Franchise Agreement with that Franchised Utility.
- Registration Required

Any Person engaging in construction activities within the City's public right-of-way is required to be registered with the City's Department of Public Works as an Authorized City's public right-of-way Contractor. This process may sometimes be referred to as a "Qualified Contractor Permit". Any Contractor installing utilities must be licensed by the State of Georgia as a "Utility Contractor."

#### Registration Requirements

To register with the City as a Qualified Contractor, an applicant must provide proof of:

1. A State of Georgia business license or
2. Certificate of Authority issued by the State of Georgia for out-of-state business
3. Liability Insurance with a minimum policy in the amount of \$3,000,000. The amount of the policy is updated as deemed necessary by the City's Risk Manager and shall name the City of Atlanta, its officers, employees and agents as additional insured.
4. Qualified to do work required. Qualified Contractors should, contact the City of Atlanta Public Works at (404) 330-6501 for additional information on how to obtain a permit.

#### a. Registration Information

Authorized City's public right-of-way Contractor registration information will be kept on file in the Department of Public Works.

#### b. Registration Fee

The Registration Fee varies from \$45 - \$200 depending on the type of activity being performed within the right-of-way. Annual registration will be valid for multiple work locations. Registration as an Authorized Contractor is separate from and in addition to a Construction Permit.

#### c. City Department Responsible For Registration

Authorized City's public right-of-way Contractor registration is issued by:

Department of Public Works/Office of Transportation  
City Hall South  
55 Trinity Avenue SW, Suite 4900  
Atlanta, Georgia 30303  
Telephone 404-330-6501

### Section 3: City public right-of-way Construction Permits

#### a. Issuance Relation to Building Permits

Permits for construction within the City public right-of-way are issued by the City's Department of Public Works. These permits are separate from and independent of, Building Permits, which are issued by the Bureau of Buildings for construction activities on private property.

b. Specific activities requiring Permit

A permit from the City's Department of Public Works is required for:

Any type of construction, repair or maintenance of any facility within the City's public right-of-way that impacts the traveled way, with the exception of repair and maintenance conducted by franchise utilities to existing facilities pursuant to the issuance of a maintenance permit as set forth in Sec. 138-65 (a) (1) of the City of Atlanta Code of Ordinances requires a Permit. Maintenance and repair activities shall include, but not limited to the repair of low hanging cable wires, repair or replacement of poles to facilitate the improvement of the City's public right-of-way or in order to protect public health, safety and welfare.

1. Any type of construction exceeding 500 feet that involves digging, excavating, or placing material within the City's public right-of-way
2. Any type of construction that involves the use of mechanized construction equipment within the City's public right-of-way
3. Digging up and carrying away earth and other material from street or sidewalk. It is unlawful for any person to dump or deposit, remove and carry away gravel earth, dirt, rock, sand or other materials which are a part of any street or sidewalk of the City Refer to City of Atlanta *Code of Ordinances Section 138-11*
4. Any type of construction that involves cutting or removing pavement or placing poles, transformers, or control cabinets.

c. Engineering Drawings Required

To receive a permit to conduct construction activity within a City's public right-of-way, the applicant must submit engineering drawings for review and approval by the City's Department of Public Works.

d. Inspections

All work performed in the City's public right-of-way is subject to inspection by the City's Department of Public Works. It is the obligation of the permitted person to make the site available to inspection within 24 hours.

e. Inspection Costs

The cost of basic site inspection is included in the permit fee. If repeat or extended inspections are required, an inspection fee of \$50.00 per hour will be charged. Franchise Utilities are exempt from all permit fees.

#### **Section 4: Construction in the City's public right-of-way in Conjunction with Permitted Private Property Construction**

a. Requirements for additional Permit

An additional and separate permit from the City's Department of Public Works is not required if all of the following apply:

1. A private property construction project was issued a Building Permit through the Bureau of Buildings
2. In the course of the permitting process, the permitted plans were reviewed and stamped by the City's Department of Public Works
3. The permitted plans provide for the construction of storm sewers, sanitary sewers, other utilities, Sidewalks, or driveway aprons within the City's public right-of-way as a condition of the building permit, for which permit and inspection fees were paid.

b. Work within the City's public right-of-way

Any work within the City's public right-of-way must be performed by an Authorized public right-of-way Contractor, and the Department of Public Works must be notified immediately prior to construction so that its inspectors may monitor and inspect the work within the City's public right-of-way.

c. Inspection Fees

The cost of inspection will be included in the Site Development inspection fee.

d. The aforementioned section shall not apply to franchised utilities.

## **Section 5: Additional Permits required**

Construction in the City's public right-of-way may require additional permit(s) beyond the construction permit. Additional permits which may be required include:

a. Driveway Permit

1. Requirements

A Driveway Permit is required for a curb cut, or to construct or repair a driveway apron along a public Street. A Person registered as an Authorized City's public right-of-way Contractor must perform any work within the City's public right-of-way.

b. Open Cuts Requirements

1. Contractors must obtain a valid permit.
2. Contractors must call in all locations.
3. Contractors must provide a brief explanation, on the plans, as to why an open cut is necessary.
4. Contractors must call inspectors prior to the start of work.
5. Contractors must use a trench box in all cuts with a depth of 4ft or greater.
6. All work and repairs are to be performed per City of Atlanta's standards.

7. Contractors must provide uniformed officers on major thoroughfares, at signaled intersections and full street closures.
- c. Exception

A separate Driveway Permit is not required for Construction in the City's public right-of-way in Conjunction with Permitted Private Property Construction if all of the previously listed requirements are met.
- d. Issuance

Driveway Permits are issued by:

City of Atlanta  
Department of Public Works/Office of Transportation  
Suite 4900 City Hall, South  
55 Trinity Avenue SW  
Atlanta, GA 30303-0325  
404-330-6501
- e. Fees

The Driveway Permit fee is \$50.00 per location unless inspection has been included in other permit fees. Notwithstanding the foregoing, inspection costs shall not apply to franchised utilities. Such payment shall be in lieu of permit, inspection or driveway fees.

Franchise Utilities are exempt from all permit fees.

## **Section 6: Lane Closure, Full Street Closure or Sidewalk Closure Permit**

- a. Requirements

With the exception of work conducted by a Franchise Utility pursuant to a scheduled maintenance permit for limited time and scope, a lane closure, full street closure or sidewalk closure permit is required for any activity that requires blocking or closing a lane (s), street or the sidewalk. This permit is in addition to a construction permit. Please refer to Appendix F for specific requirements. In lieu of a permit, Franchise Utilities shall provide general notice to the City of work conducted by a Franchise Utility pursuant to a Scheduled Maintenance Permit.

Full street closure requires submission of application at least 96 business hours in advance of the date of closure in order to notify emergency services, affected property owners and other affected public agencies.
- b. Issuance

Street closure, lane closure and sidewalk closure permits are issued by:

Department of Public Works/Office of Transportation  
City Hall South  
55 Trinity Avenue SW  
Atlanta, GA 30303-0325  
Telephone: 404-330-6501
- c. Franchise Utilities

Notice of lane and sidewalk closure for limited scope and duration shall be provided by the Franchise Utility to:

Department of Public Works/Office of Transportation  
City Hall South  
55 Trinity Avenue SW  
Atlanta, GA 30303-0325  
Telephone: 404-330-6501

Permits are processed via PWOP

d. Fees

The fees for street closure, lane(s) closure and sidewalk closure depend on a number of factors including the number of days and length of closure. To the extent that a Person pays or remits payment to the City pursuant to section 138-127 (h)(1) of the City of Atlanta Code of Ordinances, such payment shall be in lieu of permit fees.

Franchise Utilities are only exempt from those permit fees that are specified in State Law or Franchise Agreements. All other permit fees remain in effect.

## **Section 7: Material Hauling Permit/Haul Route Assignment**

a. Requirements

Transporting excavation or fill material to or from a location inside the City will require a permit and the assignment of a "Haul Route". The intent is to ensure that loaded dump trucks and other equipment travel the route that causes the least disruption.

b. Building Permit Condition

The assignment of a haul route may be a condition for the issuance of a building permit for work on private property.

c. Additional Permits maybe Required

Material Hauling Permits are separate from and in addition to other applicable permits.

d. Assignment of Routes: Haul Routes are assigned by:

Department of Public Works/Office of Transportation  
Office of Transportation Suite 4900  
City Hall South  
55 Trinity Avenue, S.W.  
Atlanta, GA 30303-0325  
Telephone: 404-330-6501

e. Fees

The permit fee for a haul route is \$45

Franchise Utilities are exempt from all permit fees.

## **Section 8: Minimum Requirements for City public right-of-way Construction Permit**

### **a. Requirements**

In order to obtain a construction permit, the applicant must provide the following:

An engineering plan meeting the City's Department of Public Works' Standards illustrating the work to be done. In final form (4) sets of plans are required for department approval. The plan will be reviewed and approved by the Department of Public Works prior to the issuance of a permit.

1. At minimum, open cut utility projects require a dimensioned plan showing all existing utilities. Projects proposing directional drilling require a plan and profile. A detailed checklist of information required is available from the City's Department of Public Works.
2. A proposed schedule of activities
3. Proof of registration as an "Authorized City's public right-of-way Contractor or Qualified Contractor" with the Department of Public Works
4. Proof of receipt of any other necessary review or permit which may be required. (Example: Lane Closure, Street Closure Permit, The Georgia Department of Transportation (GDOT) is responsible for review and approval), any work carried out inside the (GDOT) Right-of-Way must be authorized and permitted only by the GDOT.
5. Proof of any required Bonds or Insurance

### **b. Disposition of Plans**

1. Plans not meeting the necessary standards set forth will be marked and returned to the applicant for correction or revision and
2. If a project requires a Lane Closure or street closure or sidewalk closures, the applicant will be referred to the Office of Transportation.
3. Upon meeting all necessary requirements, and payment of appropriate fees, a permit may, at the discretion of the City, be issued.

### **c. Franchised Utilities**

#### **1. Separate Handling**

Construction permits for Franchised Utilities are handled separately from other City's public right-of-way construction permits.

#### **2. Issuance**

Franchised Utility construction permits are reviewed and issued by  
Department of Public Works/Office of Transportation  
City Hall South  
55 Trinity Avenue, S.W., Suite 4900  
Atlanta, GA 30303-0325  
Telephone: 404-330-6501

#### **3. Fees**

The permit fee is \$200.00 per project location. An inspection fee of \$50.00 per hour will also apply. The minimum charge for a single inspection is \$50.00 (one hour). Certain companies are exempt as franchise fees are paid in lieu of permit fees as stated in the franchise agreement.

## **Section 9: Conditions of Permits**

### **a. Compliance**

1. Failure to comply with any of the conditions of permit is a violation of the City's Code of Ordinances and will be subject to the penalties set forth in City's Ordinance, ([Violation Notices.doc](#))
2. Notice of Violation-If the City believes that a Person has not complied with the conditions of permit, the City shall notify the Person in writing of the exact nature of non-compliance. ("Violation Notice")
3. Persons shall have the opportunity to respond to the Violation Notice contesting the assertion of non-compliance ; and
4. Persons shall have the opportunity to cure the alleged non-compliant issue prior to the invocation of any penalties contained in the foregoing sections:

### **b. Standard Condition of Permitting**

Any permit for construction or other activities is subject to the following standard conditions unless specifically agreed otherwise in writing.

#### **1. Notification for Inspection**

At least 24 hours prior to beginning construction, the Permit Holder must notify the City's Department of Public Works designated contact person, identified on the permit, advise of the pending construction schedule and arrange for inspection of the work by the City. Failure to notify the designated contact person is a violation of the permit and may subject the violator to penalties. Permit inspector's name and contact number will be listed on the approved permit,

#### **2. Access to Abutting Property**

Anyone engaged in permitted activities within the City's public right-of-way is obligated to maintain reasonable access to property abutting the City's public right-of-way at all times.

### **c. Traffic Control:**

All traffic control must adhere to the standards set forth by the Manual on Uniform Traffic Control devices (MUTCD) and be approved the Department of Public Works..

Any traffic control left in the right-of-way, overnight, must be properly inspected and maintained by the contractor at the end of the work day.

### **d. Staging/Storage Areas**



Parking equipment and/or storing material or supplies within the City's public right-of-way is not allowed unless a designated parking/storage area is included and approved in the permitted plan.

e. Permissible working hours:

Monday – Friday (9:00 am – 4:00 pm) and (6:00 pm – 10:00 pm)  
Exceptions may be granted.

In an effort to minimize the negative effects of noise and traffic congestion caused by construction activities, time limitations may be imposed on construction activities as stated in the City's Noise Ordinance [138-Section \(See 138-16\) and Code 150-293.](#)

f. Exceptions

Driveways, entrances to businesses, including, but not limited to, loading docks, work areas, parking areas and other methods for obtaining access to property, may be temporarily disrupted only under the following conditions:

1. If specifically stipulated in the permit
2. For periods of short duration at non-critical times
3. After sufficient notice has been given to the affected property owner(s) resident(s) & tenant(s).

## **Section 10: Public Notification, Signs & Identification**

a. Public Notification and Site Identification

1. Whenever construction activities are to be performed in the City's public right-of-way, the Commissioner of Public Works shall require the Person conducting activities pursuant to a permit to provide the public with reasonable notification of impending work.
2. Public notice shall be made to the affected neighborhood in the form of the placement and maintenance of appropriate signs in appropriate locations and/or notification in writing to the Neighborhood Planning Organizations (NPU), as required by the City's Department of Public Works, in advance of the construction activities. The notification should include type of construction, dates and affected streets. This will be a condition of the permit for any activity within the public right-of-way that may reasonably be expected to:
  - Continue for more than 8 hours
  - Cause an unusual degree of noise or vibration
  - Involve the closure of a full street.
  - Include an excavation within or the cutting or removal of asphalt or concrete pavement.

b. Signs

### 1. Sign Requirements

The posting of signs must adequately identify each construction site. Failure to properly maintain appropriate signage for the duration of the project could be a cause for suspension of construction permits.

### 2. Number of Signs

A minimum of two signs must be placed at each construction site. However, where the manual on Uniform Traffic Devices (MUTCD) requires more signage, MUTCD requirements shall be used.

### 3. Location of Signs Visibility Other Physical and Temporal Sign Requirements:

- Sign location, size and installation shall conform to MUTCD requirements.
- Signs must be placed in a location adjacent to the construction activity, readily visible to the traveling public.
- Signs may be posted on traffic barricades, installed on temporary stakes, or by other means acceptable to the City's Department of Public Works. Permission must be obtained from the pole owner prior to attaching signs to their poles.
- Signs must be visible to vehicles and pedestrians traveling in either direction.
- Signs must have a surface area of not less than 3 square feet.
- Lettering must be legible block letters not less than 2" high.
- Sign material must be sufficient to withstand outdoor exposure for the duration of the project.
- Signs must remain in place until all work is complete, including any re-paving and re-grassing.
- A sample Public Notification and Construction Site Identification Sign is shown in the *Appendix D*

### c. Door-to-Door Notification

#### 1. Requirements

Abutting property owners and tenants along the route of the construction must be notified of the pending activity within the City's public right-of-way that would unreasonably interfere with either the egress or ingress into said owner's property or include the placement of a permanent structure (Utility Box). Notification shall consist of the distribution of flyers, pamphlets, door-hangers, etc... identifying the area, activities and duration at least 5 days prior to the beginning of construction. Construction activities should be defined to include work that involves demolition, excavation and explosives and not include routine repairs such as service connects and/or disconnect.

**\*\*Note:** Franchise Utilities may use any combination of door hangers, signs or mailings to advise affected residents and/or NPU Organizations, as required by the City's Department of Public Works, of scheduled and active construction projects.

#### d. Vehicle Identification

##### 1. Clear Markings Required

Any vehicle and/or construction equipment or equipment used in conjunction with permitted activities within the City's public right-of-way must be clearly marked or labeled, identifying the Company for which the work is being performed, as well as the Company performing the work.

##### 2. Vehicle Display of Type of Permit

All vehicles must display on the rear of the vehicle or inside the rear windshield a notice, in legible form, clearly visible to the public, stating the type of permit under which the work is being performed.

##### 3. Compliance

- a. Failure to display appropriate notice will be a violation and will be subject to penalties.
- b. Notice of Violation-If the City believes that a Person has not complied with provisions of this section, City shall notify the Person in writing of the exact nature of non-compliance. ("Violation Notice")
- c. Persons shall have the opportunity to respond to the Violation Notice contesting the assertion of non-compliance ; and
- d. Persons shall have the opportunity to cure the alleged non-compliant issue prior to the invocation of any penalties contained in the foregoing sections.

#### **Section 11: Excavation within the City's public right-of-way**

**There is a three (3) year moratorium on all open cuts on streets resurfaced under the Renew Atlanta Program. Emergency repairs, service connections and disconnections will be allowed in the event of eminent danger to public safety, health and wellness. In the case of emergency repairs, service connections and disconnections, the restoration required is mill and/or overlay 100 feet each side of the trench for the full width of the lane, lanes or street.**

Any permit for construction or other activities that involve excavation within the City's public right-of-way is subject to the following conditions unless specifically agreed otherwise by the City.

##### a. Tie Back Wall Agreement

A Resolution authorizing the Mayor to accept and execute an agreement to permit the construction of Temporary Retaining Walls, employing a Pre-stressed Tie-Back system located within the and under the City's public right-of-way adjoining the private property. The City reserves the rights to limit and regulate the usage of the surface, to provide conditions for allowing for other purposes.

##### b. Utility Location and Marking

###### 1. Utility Protection Notification

Unless part of a large project agreement, at least 48 hours prior to any excavation, directional drilling, jacking and boring, or other similar activity that may damage existing utilities within the City's public right-of-way, the Person responsible for that activity must notify the Utility Protection Center (Call before You Dig) at 1-800-282-7411 or 811 to request the marking of all existing utilities in the affected area. No excavation, directional drilling, jacking or boring, or other similar activity, may begin until all utilities are appropriately and accurately marked.

## 2. Removal of Utility Markings

Utility Markings are water soluble and will be removed by normal weather conditions. The City recognizes the following standard marking codes as set by the American Public Works Association (APWA).

**Table 1** Department of Public Works Color Code for Underground Utilities Marking  
(adopted from American Public Works Association)

White	Proposed Excavation
Pink	Temporary Survey Makings
Red	Electric Power Lines, Cables, Conduit, and Lighting Cables
Yellow	Gas, Oil, Steam, Petroleum, or Gaseous Materials
Orange	Communication, Alarm or Signal Lines, Cables or Conduits.
Blue	Potable Water
Purple	Reclaimed Water, Irrigation, and Slurry Lines
Green	Sewers and Drain Lines

### c. Duration of Excavation

Upon opening an excavation within the City's public right-of-way, the Permit Holder must diligently execute the work in order to minimize the duration of any open excavation.

### d. Dimension of Excavation

The open portion of any trench excavation must be kept at a minimum. Trenches must be backfilled as soon as the necessary utility work is completed. No opening of additional length of trench may be performed prior to the timely backfilling of the completed portion. At no time may any open construction trench or ditch to exceed 500 feet in length. Exceptions may be granted.

### e. Closure of Excavations

Persons performing excavations must close all excavations immediately upon completion of the work or upon notice from the City. Where an excavation in a vehicular traffic lane must be temporarily opened to traffic prior to the final closure, a metal plate or plates may be used as a temporary closure so long as appropriate installation and safety issues are addressed, and all conditions set for the use of metal plates in this manual or by applicable governmental requirements are met.

f. Safety

1. Excavation Shoring: Compliance with Governmental requirements

All work within the City's public right-of-way must be done in a safe and lawful manner. Excavation must be appropriately shored and workers must be adequately protected. Contractors, subcontractors, utility owners, and any other associated Person will all be responsible for meeting the appropriate OSHA regulations and all applicable industry safety requirements and other governmental requirements.

2. Public Protection

The public must be adequately protected (as specified in the current MUTCD) in and around all excavations by the erection of appropriate barricades, warning signs, flashing lights, and other necessary safety devices. A safe route of passage around the excavation site must be provided to pedestrians at all times. Unless specifically permitted by the City, the use of metal plates to cover sidewalk excavations is prohibited.

3. Compliance

Failure to maintain a safe site is a violation of applicable governmental requirements and is subject to penalties, including revocation of permit.

- a. Notice of Violation-If the City believes that a Person has not complied with provisions of this section, City shall notify the Person in writing of the exact nature of non-compliance. [Violation Notices.doc](#)
- b. Persons shall have the opportunity to respond to the Violation Notice contesting the assertion of non-compliance ; and
- c. Persons shall have the opportunity to cure the alleged non-compliant issue prior to the invocation of any penalties contained in the foregoing sections.

g. Best Management Practices for Soil Erosion and Sedimentation Protection

<http://www.state.hi.us/dlnr/dofaw/wmp/bmps.htm>

Persons engaged in "earth-disturbing activities" within the City's public right-of-way must employ "Best Management Practices" for soil erosion and sedimentation protection as required by applicable Georgia Soil and Water Conservation [http://www.gaswcc.org/docs/field\\_manual\\_4ed.pdf](http://www.gaswcc.org/docs/field_manual_4ed.pdf)) and the City's Code of Ordinances ([ARTICLE II Erosion.doc](#)) Failure to employ best management practices will be reason to Revoke a permit and those responsible will be subject to fines and legal action.

h. Liability for Damage

Permits for construction within the City's public right-of-way do not limit liability for damage to existing utilities or public facilities, or any other damages that may ensue from the Permit Holder's activities. The named Permit Holder is liable for all damages done in the execution of the work. Contractors and Franchised Utilities are liable for all damages caused by any of their contractors, subcontractors, material men, suppliers or other similar Persons at any tier.

#### i. Alternative Excavation Technology

All Permit Holders must employ all reasonable efforts to minimize damage to the City's public right-of-way and to reduce risk to existing utilities. Persons engaged in excavation in the City's public right-of-way are encouraged to utilize "alternative technology" such as "dirt vacuuming" when such technology is appropriate and will reduce the negative impact on the City's public right-of-way.

#### j. Directional Drilling

Directional drilling may only be used in those areas in which other construction techniques pose an equal or greater risk of damage to existing utilities, and to areas where the risk of damage is offset by public convenience.

##### a. Restoration of the City's public right-of-way

##### 1. Restoration after construction

Upon completion of the permitted work, including restoration notification to the Department of Public Works is required. Restoration may include the repaving of streets, removal of barricades, or obstructions and excavation material and the installation of appropriate vegetation.

- Restoration responsibility

The Permit Holder is liable for any damage done in the execution of work within the City's public right-of-way and is responsible for restoring the City's public right-of-way.

- Flowable Fill - Optional as backfill

- Vegetation

Restoring appropriate vegetation within the City's public right-of-way is a condition of the permit and a requirement of applicable governmental requirements, including Georgia State Law and the City's Code of Ordinances

<http://www.municode.com/resources/gateway.asp?pid=10376&sid=10>

#### k. General Requirements

Unless specifically permitted otherwise by the City, all excavations within the City's public right-of-way that impact the existing asphalt or concrete pavement of Streets or Sidewalks may be backfilled with "Flowable Fill." Excavated material must be removed from the site.

#### l. Characteristics of Flowable Fill Material:

1. Flowable Fill is also known as "Controlled Low Strength Material (CLSM)", "Lean Mix Backfill", or "Flowable Mortar". It is a blend of cement, water, sand and flyash designed as a low strength, flowable material requiring no subsequent vibration or tamping to achieve complete consolidation. It is self-leveling, self-compacting, and fills all voids. It does not settle or rut under loading, thus preventing the formation of "dips" in the pavement above utility cuts 2 or 3 years after the repair of an excavation.

2. Flowable Fill will generally set hard enough to support the weight of an individual within 2 to 4 hours after its initial placement. (Quicker setting mixes can be achieved at additional cost, if necessary.) At 24 hours, flowable fill can support the weight of vehicles yet can still be excavated manually with a shovel.

Table 2

Compressive Strength of Flowable Material

Days   Compressive Strength, PSI

3	23
7	40+
28	50-100
90	317
180	417
365	403

Typical Ratio of Contents of Flowable Fill\*\*\*

Cement	100 lbs/cy
Fly Ash (type F)	200 lbs/cy
Sand	2700 lbs/cy
Water	550 lbs/cy

\*\*\*The City may request the Permit Holder to use a specific ratio of contents of flowable fill, depending upon the specific requirements of the project at issue. And to the extent practicable, the Permit Holder shall make a good faith effort to comply with City's request for a specific ratio of contents of flowable fill.

Flowable fill is NOT a substitute for or interchangeable with concrete. It has no large aggregate and less than 20% of the cement content of concrete. Concrete is also not a substitute for flowable fill.

m. Placement of Flowable Fill at or Below Pavement Level Time Requirements.

1. If the final surface course of pavement can be restored within 3 Days, flowable fill must be placed short of the final surface elevation by the thickness of the final pavement, thereby, allowing the final pavement to be placed flush with the existing pavement. Metal plates must cover the incomplete repair until the final pavement is restored.
2. If the final surface course of pavement cannot be restored within 3 Days, flowable fill must be placed flush with the existing pavement. Metal plates

must be used over this flowable fill until the fill has sufficiently hardened to carry traffic loads (approximately 24 hours). Metal plates must then be removed and the backfill must temporarily support traffic until the pavement can be restored. When final pavement is placed, the backfill must be removed to an appropriate thickness such that the final pavement is flush with the existing pavement.

#### n. Metal Plates

##### 1. Length of Use Limitations

The use of metal plates to cover pavement cuts and excavations will be limited to 5 business days after work is completed unless special permission is granted by the City's Department of Public Works. Plates left in the City's public right-of-way more than 5 business days after work is completed, weather permitting and/or availability of materials, are subject to removal by the Department of Public Works. An assessment of \$100.00 will be charged for the removal of any metal plate. The assessment must be paid in full before the Department of Public Works will return the metal plate. Assessments do not apply to Franchise Utilities.

##### 2. Liability

The owner, lessor, user, installer, or other similar Persons, of metal plates used within the City's public right-of-way is liable for all injuries or damages to Persons, vehicles or other property (real or personal) that may result from their improper placement or use, or the failure to ensure that they continue to be properly and securely placed and appropriately used.

##### 3. Plate Identification Required

Whenever metal plates are either leased, rented or placed, the said plates must be clearly identified with the name or initials of the owner.

##### 4. Record of Plate Identification Information with City

In order to minimize confusion in identifying plates, plate owners must record their company name and plate identification initials with the Department of Public Works. Plate identification marks currently on record with the Department of Public Works at the time of the publication of this manual are:

1. AGL-Atlanta Gas Light
2. ANSCO-Ansco
3. DPW -Department of Public Works
4. AWW, SEWER – Department of Watershed Management
5. BST – Bell South/AT&T
6. GPC – Georgia Power Company
7. LVL3 – Level (3) Communications
8. USRP – U. S. Rental Plates and
9. BDW – Bureau of Drinking Water
10. COM-Comcast Cable Communications

The City may, from time to time, issue a list of current registrants without the need to formally amend this manual.



5. Alternative Plate Identification Methods

Adhesive plastic signs similar to that typically used on vehicle “bumper stickers” may identify plates provided, however, that the surface of the metal plate is sufficiently prepared to allow the adhesive plastic sign to remain affixed to the metal plate for the entire duration it is intended to protect an excavation area within the City’s public right-of-way.

It is, at all times and regardless of the method of metal plate identification used, the responsibility of the plate user to ensure that plates are adequately and legibly identified at all times.

6. Failure to Identify Plates

Metal plates placed in the City’s public right-of-way without proper identification are subject to immediate removal and confiscation by the Department of Public Works. If an unidentified plate is removed, the site will be made safe by the Department of Public Works.

o. Asphalt Pavement damage repair Requirements:

The Commissioner of Public Works shall require an inlay or overlay beyond the cut limits for the full width of the lane, lanes or road surface to improve the road smoothness and appearance depending on the age of the last paving operations as follows:

**There is a three (3) year moratorium on all open cuts on streets resurfaced under the Renew Atlanta Program. Emergency repairs, service connections and disconnections will be allowed in the event of eminent danger to public safety, health and wellness. In the case of emergency repairs, service connections and disconnections, the restoration required is mill and/or overlay 100 feet each side of the trench for the full width of the lane, lanes or street.**

1. If the existing pavement is up to 4 years old, mill and/or overlay 100 feet each side of the trench for the full width of the lane, lanes or street.
2. If the existing pavement is 4 years up to 7 years old, mill and/or overlay 50 feet each side of the trench for the full width of the lane, lanes or street.
3. If the existing pavement is over 7 years old, pavement repair shall be replaced in kind using construction procedures in accordance with the City Standard details for the full width of the lane, lanes or street.
4. If in any one block or 500 linear feet, the cumulative damage to the pavement exceeds 200 square feet, the affected lane must be resurfaced for the length of damage.

p. Multiple Lanes

If pavement is damaged in more than one lane, the City may require that the Street be repaved across its full width.

q. Milling Requirements

If field conditions warrant, milling may be required prior to repaving. In the event of a requirement of milling, terms and conditions shall be specified in the permit.

r. Sidewalks

1. Application of City Standards

Damage to Sidewalks must be repaired in accordance with the City's Standard Details.

2. Asphalt Prohibited

Concrete Sidewalks may not be permanently or temporarily repaired with asphalt.

3. Decorative Sidewalk Agreements

Sidewalks previously improved under the terms of a Decorative Sidewalk agreement must be repaired in compliance with the terms of that agreement

4. Additional Special Conditions

The City may impose additional requirements for scheduling work in designated Pedestrian Zones and for the repair of Sidewalks in areas where the Sidewalk improvement program is currently active, according to the MUTCD.

**Part 6: Special Agreements**

Section 1: General Provisions Concerning Encroachments

Any activity that occupies space (encroaches) in a City's public right-of-way for a continuous or extended period requires, in addition to a permit, a Special Agreement. Special Agreements are in effect contracts between the property owner and other appropriate Persons, depending on the circumstances, and the City. Special Agreements must be authorized by the City Council and signed by the Mayor or his designee, as set forth in the City's Code of Ordinances.

a. Required Special Agreement Provisions

The City's Code of Ordinances requires Special Agreements to contain certain provisions for the City's protection: Specifically, Special Agreements are generally required to contain provisions including, but not limited to the following:

1. Indemnifying and holding the City harmless
2. Posting Appropriate Bonds
3. Maintaining Adequate Insurance
4. Maintaining the Encroachment
5. Removing the Encroachment
6. Paying rental fees relating to the Encroachment in accordance with the City's Code of Ordinances

b. Contact Information

Persons wishing to enter into special agreements with the City should contact:

Department of Public Works/Office of Transportation  
Office of Transportation Suite 4900

City Hall South  
55 Trinity Avenue, S.W.  
Atlanta, GA 30303-0325  
Telephone: 404-330-6501

c. Potential Situations Involving Special Agreements

The most frequently encountered situations requiring Special Agreements are privately constructed and operated Bridges or Tunnels, Decorative Sidewalks, Awnings or Marquises, and Special Encroachments.

## **Section 2: Bridges and Tunnels**

In order for a person to construct, own, or operate a private pedestrian, vehicular, or utility bridge, tunnel, or similar passage between buildings over, under, or into the City's public right-of-way, a Special Agreement is required. Use of a bridge, tunnel, or passageway is limited solely to intermittent passage of pedestrians or vehicles, or for locating (non-franchise) utilities. Encroachment space cannot be utilized as occupied space for Persons, for the transaction of business, or for storage of material.

## **Section 3: Decorative Sidewalks**

a. City Standards Policy

The City maintains standards for Sidewalk construction within the City's public right-of-way. The intent of these standards is to ensure that Sidewalks are constructed in a safe, cost effective, and easily repairable manner.

b. Special Sidewalk Districts:

Certain historic or special districts within the City may have additional requirements for brick Sidewalks, extra width Sidewalks, or other details. These requirements are on file with the City's Bureau of Planning.

c. Decorative Sidewalk Agreements

If a Person desires to construct a Sidewalk in the City's public right-of-way abutting that Person's property that is to be constructed from unusual or exotic material, is to be of a non-standard design or construction, will vary from the requirements of an applicable historic or special district, or otherwise will be special or unique, a Special Agreement (Decorative Sidewalk Agreement) is required. Civic improvement groups or other entities wishing to construct decorative Sidewalks

Abutting multiple properties may enter into Special Agreements with the City.

d. Limitations Applicable To Decorative Sidewalks

1. The use of light gray or buff color tinted concrete, or geometric imprints (hex pattern, brick pattern, etc.) in broom finish concrete, do not alone constitute a Decorative Sidewalk, and do not require a Special Agreement. However, such details must be shown on the engineering plans submitted for a permit.
2. The use of vivid or exotic colors, inlays, special stones, non-standard textures, or pavers does constitute a Decorative Sidewalk and requires a Special Agreement.
3. Unless a Special Agreement specifically states to the contrary, the owner of abutting property is obligated to maintain the Sidewalks fronting the owner's

property, including any Decorative Sidewalks. If City or public utility work crews cut or damage a standard Sidewalk, they must repair the Sidewalk to good condition. If City or public utility work crews damage a Decorative Sidewalk, they must make good faith efforts to minimize damage, save paving materials removed, and repair the Sidewalk in a compatible manner.

However, if the repair of a Decorative Sidewalk requires extraordinary time, effort, or material, the owner of the Sidewalk is responsible for the extra time, effort, and material, necessary to make the repair.

#### **Section 4: Awnings and Marquees**

Erecting and maintaining any awning, canopy, marquee, or sign structure attached to a building or free standing, that occupies space within the City's public right-of-way, or that, in the event of failure, may present a danger to the public, will require a Special Agreement.

#### **Section 5: Special Encroachment**

Constructing, erecting, and maintaining any non-standard structure or facility within the City's public right-of-way will require a Special Agreement. Examples include, but are not limited to, Street furniture, fountains, trash cans, recreation or playground

a. **Tie Back Wall Agreement Encroachment**

A resolution authorizing the Mayor to accept and execute an agreement to permit the construction of temporary Retaining Walls employing a Pre-stressed Tie-Back system located within and under the City's public right-of-way adjoining the private Property. The City reserves the right to limit and regulate the usage of the surface, subsurface and aerial space within the City's public right-of-way, to provide equipment, kiosk, etc.

#### **Section 6: Categories of City Streets**

The City of Atlanta's street system is functionally classified as Local, Collector, Arterial and Expressway. The classification system groups streets based on their intended purpose such as providing mobility between destinations, access to properties and a combination of mobility and access. Please refer to *Appendixes A and B* for a list of collector and arterial streets within the City limit.

#### **Section 7: Time of Day Restrictions**

a. **Specific Restrictions**

Unless specifically stated otherwise in the permit, the following time of Day restrictions will apply to permitted construction within the City's public right-of-way:

1. No lane of any arterial or collector Street may be blocked for any period between 7:00 AM and 9:00 AM or between 4:00 PM and 6:00 PM
2. No nighttime activities are allowed as per City Code Chapter 74, Article IV Noise Control. Please refer to the Code Section for exempted activities and specific requirements.
3. Adjustment of Time of Day Restrictions

- a. The Department of Public Works reserves the right to adjust or amend the allowable time of day restrictions (in general or in a specific location) for any permitted activity within the City's public right-of-way, as circumstances require.

City of Atlanta  
Department Of Public Work – Right-of-Way

Plan Review Checklist [Further Discussion by Parties]

Address: \_\_\_\_\_ Reviewed By: \_\_\_\_\_

1. Show project number (phase and section number) on plans.
2. Show and label land lot numbers and lines.
3. Show and label land district numbers and lines.
4. Flag project site on location sketch and show north arrow.
5. Note Stations on primary centerline used throughout the project.
6. Label limits of rights of way acquisition on cross streets (where station/offset information is taken from cross street centerline).
7. Note the beginning and end of right of way Acquisition. Mile log designation – to the nearest tenth – if available. Project show one Begin and one end acquisition; with beginning right of way acquisition extending from left to right without regard to the north arrow direction.
8. Show full stations and offsets (on Metric Plans include English and Metric offset distances); if more than one centerline is used state which centerline the information is taken from or provide general note. If general note is provided; please make sure it agrees with centerline stations and offsets are taken from in alignment. Includes existing and required right –of- way points at P.C. and P.T. Stations.
9. Label survey centerline with bearing.
10. Label construction centerline with bearing.
11. Show street names - all existing locations including mainline, State Route and U.S. Numbers
12. Label or provide legend to identify construction limits, include symbols for cut "C" or fill "F".  
Sheet may overlap. (For clarity of parcels, however, duplicate information should be kept to a minimum).
13. Label or provide legend for existing right of way and existing limited access. Existing right of way must be shown on County Roads. If existing right of way were determined, please show area maintained as existing right of way.
14. Label or provide legend for required right of way and limited access.
15. Show curve data.
16. Show revision block, all revision must be shown on cover sheet
17. Clearly show for dual project plans the beginning/end of each project.
18. Show the beginning and end Right of way acquisition.
19. Provide a title block.

20. Include "Legend" for limited access, required right of way, property lines, existing right of way, construction limits, easements and any other symbols used in the plans. Complete Standard Right-of-Way Legend by using additional symbols.  
Show Angles and stations where centerline crosses street.
21. Show Edge of pavement where (existing and proposed) on mainline, cross roads and drives.
22. Label limits of rights of way acquisition on cross streets. Where station/offset information is taken from cross street centerline
23. Include equality stations.
24. Identify any utility relocation.
25. Show and label drainage, culverts, channel changes, side and cross drains.
26. Show driveways, tie-ins and cross streets.
27. Sheet must have revision block.
28. Show the scale on each plan sheet.
29. Show property limits on all projects if available
30. Coordinates are required at two points on the centerline for each plan sheet. These points should be reference points such as Pac's, Pit's, side sheet centerline intersections or railroad intersections. (If reference point is not available, every station should be used).
31. Right of Way from railroads should be referenced from both the centerline and the nearest railroad milepost. Coordinates are required.
32. Locate the railroad milepost apply to all areas of right of way and easement, which are not contiguous.
33. Right of Way for Individual Property (Parcels). & P.T. Stations.
34. On all lines within the required right of way, show bearings and distances (arcs), and radius on all curved lines. On Curved line, include chord length and chord bearing. Exception: Bearings not required on existing right of way.
35. The area for required Right of Way. (Square feet and acres) Acres and hectares should be computed to three decimal places; Square Feet and Square Meters to two decimal places.
36. Any Parcels with remainders on each side of a project or which cross street on the project must show separate areas for each remainder. Parcels with easement acquisition only (except driveway easement) should give a remainder or total lot size. Any area less than an acre should be shown as 0. --+/- Acre, 1- 10 acres - - And over 10 acres to the nearest acre plus or minus.
37. Provide Easement Labeled or legend. Full Station and Offset required; hatch construction easements. On railroad parcels, easements should not be closer than 15 feet from the centerline of the tract.
38. Driveway easement should have full station and offset on all points. Metric Plans should give both Metric and English Offsets. Specify in Data Table the total number of driveway easements per parcel.
39. Show easement area in square feet for each type of easement. This (Does not include driveway easements). Any Parcels requiring easement only should also give a remainder or total lot size (This does not include driveway easements).
40. Show all applicable parcel number on all sheets. Survey Chain numbers are not acceptable as Parcel numbers.
41. Show all applicable names of the property owner's on all sheets.
42. Label all Buildings. (If Data is Available)
43. Access Breaks. Show dimension of Access Breaks and Driveways. Provide station and offset, parcel number, owner name, and total area.
44. Show paving improvements within required right of way.

45. Show signs, gas islands, pump tanks, and permanent light fixtures. Signs within the required rights of way should be located and annotated.
46. Note the reference parcel number must be shown on sheet to cover the entire parcel as shown on plans.
47. Note any parcels with tracts should show a total area for the required right of way, easement (for each type of easement excluding driveways).
48. Note the descriptions shown for each Parcel should proceed in a clockwise direction.



# **Office of Transportation's Franchised Utilities Section**



**There is a three (3) year moratorium on all open cuts on streets resurfaced under the Renew Atlanta Program. Emergency repairs, service connections and disconnections will be allowed in the event of eminent danger to public safety, health and wellness.****Part 7: Franchised Utilities**

In general, Franchised Utilities with facilities located in the City's public right-of-way are subject to the requirements, conditions, and obligations as any other Person working within the City's public right-of-way. However, certain specifics particularly applicable to Franchised Utilities are more fully discussed.

## **Section 1:**

### ***Permits Issued to Franchised Utilities***

Permits for Construction, Maintenance, or Repair of facilities owned by Franchised Utilities in the City's public right-of-way are issued by the City's Department of Public Works. Permits are issued to Franchised Utilities only and not to the Franchised Utilities' individual contractors, subcontractors, material men, suppliers or similar person at any tier. A Franchised Utility is responsible for all work performed in the City's public right-of-way and all damages caused by or resulting from any person performing work for the Franchised Utility.

## **Section 2:**

### **Submittal of Permit Applications**

Permit Applications for work in the City's public right-of-way should be submitted to:

Department of Public Works/Office of Transportation  
City Hall South  
55 Trinity Avenue, S.W., Suite 4900  
Atlanta, GA 30303-0325  
Telephone: 404-330-6501

Or electronically by utilizing the Public Work's Online Permitting System

## **Section 3:**

### **Route Selection**

Pursuant to public, health, safety, and welfare, the Department of Public Works reserves the right to review the selection of locations and routes of utilities, proposed by Franchised Utilities. The design and construction of distribution and transmission facilities are in accordance with the National Electric Safety Code (NESC) and is regulated by State & Federal Government.

### **Placement of Support Facilities:**

#### **1. Right of Review**

The Department of Public Works reserves the right to review, the placement of support facilities and equipment within the City's public right-of-way, proposed by Franchised Utilities. Support equipment and facilities (switching boxes, amplifiers, connection panels, poles, etc.) must be located such that they do not interfere with the movement of vehicles or pedestrians, or block sight-lines at intersections. Request for placement of support facilities and equipment within the City's public right-of-way by Franchised Utilities shall not be unreasonably withheld. Moreover, Franchised Utility may appeal any

denial for request of placement of support facilities and other equipment to the Commissioner of Public Works.

## **2. Support Facilities**

The City may designate geographical areas in which facilities are preferred to be placed underground; provided however, that Franchisees are not required to place transmission and distribution facilities underground when aerial facilities exist and that where existing aerial facilities are being retired and removed from service, replacement will be made using underground construction if technically practical and economically feasible and subject to applicable state and federal law.

## **Section 4:**

### **Expedited Process for Co-Location and Joint Applications**

#### **Policy Statement**

##### **1. Intent of Manual**

It is the intent of this manual to encourage Franchised Utilities to cooperate with each other in the construction of new facilities, repair and maintenance of existing facilities and similar functions, and the scheduling of activities within the City's public right-of-way. The goal is to minimize the disruption to the public caused by multiple construction projects in any one area.

##### **2. Priority of Permit Applications Complying With Policy**

Permit applications meeting the goals of this Policy will be given priority for review by the City's Department of Public Works.

## **Section 5:**

### **Minimal Submittal Requirements for Utility Construction Permits**

#### **a. Engineering Plan**

An engineering plan meeting the Department of Public Works' standards illustrating the work to be done must be submitted. The plan must show the proposed work location in reference to neighboring street. The plan will be reviewed and must be approved by the Department of Public Works prior to the issuance of a permit.

##### **1. Traffic Control Plan**

Temporary traffic control must be provided in accordance with the current edition of the MUTCD.

##### **2. Schedule**

A schedule of activities.

##### **3. Additional Requirements**

Additional requirements may apply, depending on the specific circumstances of the application.

## **Section 6:**

### **Utility Maintenance**

Franchised Utilities engaged in routine and repetitive repair and maintenance activities within the City's public right-of-way may be eligible for special blanket permits. These permits are available for limited, short-term, and minimal impact activities. The following provisions apply to Blanket Permits. Blanket permits will be given to franchise utilities with a good work history. The blanket permit will be issued on a bi-annual basis after a review of previous work history to ensure the continuation of a good work history. In the event a franchise utility is required to park at a parking meter to perform maintenance, no fee is required.

#### **1. Qualifying Activities:**

Installation of customer service connections to existing facilities

- a. Minor adjustments to existing facilities or service connections.
- b. Various miscellaneous activities, such as checking and maintaining equipment.
- c. Any and all work necessary to restore services to customers in an impacted area.

#### **2. The following conditions apply utility scheduled maintenance activities:**

- a. No lane of any arterial or collector Street may be blocked for any period between 7:00 and 9:00 AM or between 4:00 and 6:00 PM, Monday through Friday. (Morning and Evening Rush Hour)
- b. No lane of any arterial Street may be blocked for any period exceeding 1 hour between 9:00 AM and 4:00 PM, Monday through Friday, unless a uniformed police officer is employed on site to direct traffic. A company flag man may be provided to direct traffic in lieu of uniformed police officer if blockage occurs for less than an hour between 9:00 am – 4:00 pm.
- c. No lane of any Street in a commercial or retail area may be blocked for any period exceeding 1 hour between 7:00 am and 6:00 pm, Monday through Friday.
- d. No nighttime activities are permitted, seven days a week (9:00 pm to 7:00 am.) unless circumstances exist where there is need to conduct maintenance, trouble calls, restore service to customers or repair work in the evening.
- e. No pavement cuts or excavations of any type are permitted. Minimal excavation for the purpose of replacement of existing poles is permitted, as long as dirt is removed from the site or otherwise disposed of in a manner acceptable to the City.
- f. No activities that create an unacceptable level of noise, dust, or disruption to normal activities of the population are permitted.

## **2. Emergency Repair**

Work performed pursuant to an emergency shall qualify as work performed.

### **a. Qualification Requirements**

In order to performed work to qualify as activities performed for Emergency Repair one or more of the following circumstances must exist:

1. Immediate danger to life, health, or property
2. Immediate threat of environmental damage
3. Necessity to repair damage to essential facilities resulting from extreme weather events or traffic accidents
4. Loss of service to a single customer
5. Immediate response to the problem will result in significantly reduced inconvenience to the public in the long term
6. Delay of repair will result in further damage to facilities
7. Other extraordinary conditions that can be documented as an emergency.

### **b. Notification Requirements**

Within 24 hours of the occurrence of the emergency or at the beginning of the next business day, whichever later occurs, the Franchised Utility owner must notify the City's Department of Public Works in writing of the location and nature of the emergency and submit the following, as appropriate, specifics concerning the emergency:

1. Information detailing the threat to public health or safety
2. Information concerning the threat of environmental damage
3. An engineering plan meeting the Department of Public Works standards, illustrating the work done or remaining to be done.
4. A schedule of activities
5. Payment of applicable fees and
6. Any additional information that the City may require, depending on the specific circumstances of the event.

### **c. Maintenance of Equipment in the City's public right-of-way**

The owner of any equipment or facility in the City's public right-of-way must maintain that equipment or facility with good appearance. Upon written notice from the City, and receipt of said notice by the owners, owners are required repair vandalism and to remove or cover graffiti as soon as practicable.

## Appendix A:

### Arterial Streets

#### Alphabetical Listing

Note: Streets listed may also be classified as State or Federal Highways and may be identified by a highway number designation.

<u>STREET NAME</u>	<u>SEGMENT</u>	<u>Miles</u>
Baker Street, N.E.	Luckie Street to Piedmont Avenue	0.76
Bankhead Highway, N.W.	Marietta Street to City Limits	6.4
Bell Street, N.E.	Auburn Avenue to Hill Street	0.38
Bolton Road, N.W.	Fulton Industrial Blvd. to Marietta Blvd	3.0
Briarcliff Road, N.E.	Ponce de Leon to City Limits	0.47
Buford Highway, N.E.	City Limits to Piedmont Road	1.1
Campbellton Road, S.W.	Lee Street to 166	4.53
Campbellton Road, S.W.	166 to City Limits	2.65
Candler Road, N.E. & S.E.	City Limits to City Limits	0.70
Capitol Avenue, S.W.	University Avenue to MLK Jr. Drive	1.8
Cascade Road, S.W.	City Limits to Gordon Street	3.06
Central Avenue, S.W.	Dodd Avenue to Edgewood Avenue	1.4
Cheshire Bridge Road, N.E.	Piedmont Road to Buford Highway	1.4
Cleveland Avenue, S.E. & S.W.	City Limits to Jonesboro Road	2.85
Courtland Street, N.E.	North Avenue to MLK Jr., Drive	1.5
Crown Road, S.W.	City Limits to City Limits	0.55
Decatur Street, S.E.	Peachtree Street to Gunby Street	1.4
Dekalb Avenue, N.E.	City Limits to Gumby Street	3.1
East Roxboro Road, N.E.	West Roxboro Road to Wood Circle	0.2
Edgewood Avenue, N.E.	Peachtree Street to Krog Street	1.5
Fulton Industrial Blvd., S.W.	Old Gordon Road to Bolton Road	1.8
Fulton Street, S.W.	Pryor Street to Capitol Avenue	0.4
Georgia Avenue, S.W.	Glenn Street to Capitol Avenue	1.15
Glenn Street, S.E.	Murphy Avenue to Stewart Avenue	0.2
Glenwood Avenue, S.E.	Hooper Street to Clifton Street	2.35
Gordon Street, S.W.	Cascade Avenue to Glenn Street	1.2
Harris Street, N.E.	Luckie Street to Piedmont Avenue	0.7
Hightower Road, N.W.	Bankhead Highway to MLK Jr., Drive	1.7
Hill Street, S.E.	Bell Street to Glenwood Avenue	0.4
Howell Mill Road, N.E.	Collier Road to Marietta Street	2.1
International Blvd., N.E.	Northside Drive to Piedmont Avenue	1.2
James Jackson Parkway, N.W.	City Limits to Bankhead Highway	3.0
Jonesboro Road, S.E.	City Limits to McDonough Blvd.	5.4
Juniper Street, N.E.	14 <sup>th</sup> Street to North Avenue	1.0
Lakewood Avenue, S.E.	166 to Jonesboro Road	1.1
Lavista Road, N.E.	Cheshire Bridge Road to City Limits	0.18
Lee Street, S.W.	City Limits to West Whitehall St.	2.4
Linbergh Drive, N.E.	Peachtree Road to Cheshire Bridge Road	2.1
Macon Drive, S.E.	Cleveland Avenue to Lakewood Avenue	1.35
Memorial Drive, S.W. & S.E.	Peachtree Street to City Limits	6.0
Marietta Blvd., N.W.	City Limits to West Marietta Street	3.3

Marietta Street, N.W.  
 MLK Jr. Drive, S.E. & N.W.  
 Mitchell Street, S.W.  
 Moreland Avenue, S.E. & N.E.  
 McDonough Blvd., S.E.  
 North Avenue, N.W. & N.E.  
 Northside Drive, N.W.  
 Northside Parkway, N.W.  
 Old Gordon Road, S.W.  
 Peachtree St. & Rd., N.W. & N.E.

Peachtree Center Avenue, N.E.  
 Peachtree Dunwoody Rd., N.E.  
 Peters Street, S.W.  
 Piedmont Avenue, S.E. & N.E.  
 Piedmont Road, N.E.  
 Ponce De Leon, N.E.  
 Pryor Street, S.W.  
 Ridge Avenue, S.E.  
 Roswell Road, N.E. & N.W.  
 Roxboro Road, N.E.  
 Sawtell Avenue, S.E.  
 South West Connector, S.W.  
 Spring Street, S.W. & N.W.  
 Stanton Road, S.W.  
 Steward Avenue, S.W.  
 Techwood Drive, N.W.  
 Trinity Avenue, S.W.  
 Walker Street, S.W.  
 Washington Street, S.W.  
 West Marietta Street, N.W.  
 West Peachtree Street, N.W.  
 West Whitehall Street, S.W.  
 Whitehall Street, S.W.  
 Williams Street, N.E.

**Total # of Arterial Streets = 75**

Peachtree Street to West Marietta Street 2.5  
 Hill Street to City Limits 8.7  
 Martin Luther King Jr. Dr. to Capitol Avenue 0.9  
 Ponce de Leon Avenue to City Limits 5.7  
 Moreland Avenue to University Avenue 2.5  
 Northside Drive to Bonaventure Avenue 2.5  
 Steward Avenue to Northside Parkway 7.1  
 Northside Drive to City Limits 3.6  
 MLK Jr. Dr. to Fulton Industrial Blvd 0.38  
 Memorial Drive to City Limits 10.0

Decatur Street to Edgewood Avenue 0.1  
 Roxboro Road to Meadowbrook Drive 1.9  
 Trinity Street to West Whitehall Street 1.0  
 ML King Jr. Dr. to Cheshire Bridge Road 4.3  
 Cheshire Bridge Road to Roswell Road 3.5  
 Peachtree Street to City Limits 3.2  
 Edgewood Avenue to University Avenue 2.3  
 Capitol Avenue to Pryor Street 0.4  
 Peachtree Road to City Limits 2.7  
 Peachtree Road to East Roxboro Road 0.9  
 McDonough Blvd. to Jonesboro Road 0.7  
 West Marietta Street to Bankhead Highway 1.0  
 Peachtree Street to Trinity Avenue 2.25  
 Campbellton Road to City Limits 0.4  
 City Limits to Glenn Street 4.5  
 West Peachtree Place to Walker Street 0.95  
 Spring Street to Memorial Drive 0.5  
 Techwood Drive to Peters Street 0.4  
 Martin Luther King Jr. Dr. to Memorial Drive 0.21  
 Ashby Street to Marietta Blvd. 0.55  
 Peachtree Street to Peachtree Street 2.2  
 Lee Street to Peters Street 1.52  
 Memorial Drive to Murphy Avenue 0.8  
 West Peachtree Place to International Blvd. 0.3

**Total # of Miles 158.24**

## Appendix B: State Routes

STATE ROUTE	FROM	TO
S. R. 3; U.S. 19/41 (Metropolitan Parkway)	A point 50 feet north of Mt. Zion Road (Hapeville city limits)	Northside Drive
S. R. 3 ; U.S. 19/29/41 (Northside Drive)	Metropolitan Parkway	A point 0.10 miles north of Northside Parkway
S. R. 3; U.S. 41 (Northside Parkway)	A point 0.10 miles north of Northside Drive	Cobb County Line
S. R. 8; U. S. 78/278 (Bankhead Highway)	Cobb County Line	Northside Drive
S. R. 8; U. S. 29/78/278 (North Avenue)	State Route 3/US 19/29/41 (Northside Drive)	Piedmont Avenue
S. R. 8 (Ponce De Leon Avenue)	Piedmont Avenue	Dekalb County Line
S. R. 9; U. S. 19 (14th Street)	Northside Drive	West Peachtree Street
S. R. 9; U. S. 19 (West Peachtree Street)	14th Street	Peachtree Street
S. R. 9; U. S. 19 (Peachtree St./Rd.	West Peachtree Street	Roswell Road
S. R. 9; U. S. 19 (Roswell Road)	Peachtree Road	A point 50 feet north of Meadowbrook Drive
S. R. 9; SOUTH (Spring Street)	Peachtree Street	14th Street
S. R. 10 (Freedom Pkwy.)	State Route 401/I-75	State Route 8/Ponce de Leon Avenue
S. R. 13 (Buford Highway)	Peachtree Road	Dekalb County Line
S. R. 14; U. S. 29 (Lee Street)	A point 0.05 miles north of Womack Avenue (East Point city limits)	Avon Avenue
S. R. 14; U. S. 29 (Lee Street/ West Whitehall Street)	Avon Avenue	Chapel Street
S. R. 14 (West Whitehall Street/Peters Street)	Chapel Street	Spring Street
S. R. 42; U. S. 23 (Moreland Avenue)	Dekalb County Line	A point 0.10 miles south of Custer Avenue
S. R. 42; U. S. 23 (Moreland Avenue)	A point 0.10 miles south of Custer Avenue	Ponce de Leon Avenue
S. R. 42; (Briarcliff Road)	Ponce de Leon Avenue	Dekalb County Line
S. R. 42 CONN. (Freedom Parkway Connector)	State Route 10	State Route 42
S. R. 42 SPUR (McDonough Boulevard)	Moreland Avenue	Jonesboro Road
S. R. 54 (Jonesboro Road)	Clayton County Line	Harper Road

S. R. 54 (Jonesboro Rd., McDonough Blvd., University Ave.)	Harper Road	State Route 401/I-75
S. R. 54 CONN. (Sawtell Avenue)	Jonesboro Road	McDonough Blvd.
S. R. 70 (Fulton Industrial Blvd.)	Aviation Circle	Bankhead Highway
S. R. 139 (Ralph David Abernathy Boulevard)	State Route 14/US 29/ W. Whitehall Street	Martin Luther King Jr. Drive
S. R. 139 (Martin Luther King Jr. Drive)	Ralph David Abernathy Drive	A point 0.10 mile west of Old Gordon Road
S. R. 141 (Peachtree Road)	State Route 9	Dekalb County Line



<b>STATE ROUTE</b>	<b>FROM</b>	<b>TO</b>
S. R. 3; U.S. 19/41 (Metropolitan Parkway)	A point 50 feet north of Mt. Zion Road (Hapeville city limits)	Northside Drive
S. R. 3 ; U.S. 19/29/41 (Northside Drive)	Metropolitan Parkway	A point 0.10 miles north of Northside Parkway
S. R. 3; U.S. 41 (Northside Parkway)	A point 0.10 miles north of Northside Drive	Cobb County Line
S. R. 8; U. S. 78/278 (Bankhead Highway)	Cobb County Line	Northside Drive
S. R. 8; U. S. 29/78/278 (North Avenue)	State Route 3/US 19/29/41 (Northside Drive)	Piedmont Avenue
S. R. 8 (Ponce De Leon Avenue)	Piedmont Avenue	Dekalb County Line
S. R. 9; U. S. 19 (14th Street)	Northside Drive	West Peachtree Street
S. R. 9; U. S. 19 (West Peachtree Street)	14th Street	Peachtree Street
S. R. 9; U. S. 19 (Peachtree St./Rd.	West Peachtree Street	Roswell Road
S. R. 9; U. S. 19 (Roswell Road)	Peachtree Road	A point 50 feet north of Meadowbrook Drive
S. R. 9; SOUTH (Spring Street)	Peachtree Street	14th Street
S. R. 10 (Freedom Pkwy.)	State Route 401/I-75	State Route 8/Ponce de Leon Avenue
S. R. 13 (Buford Highway)	Peachtree Road	Dekalb County Line
S. R. 14; U. S. 29 (Lee Street)	A point 0.05 miles north of Womack Avenue (East Point city limits)	Avon Avenue
S. R. 14; U. S. 29 (Lee Street/ West Whitehall Street)	Avon Avenue	Chapel Street
S. R. 14 (West Whitehall Street/Peters Street)	Chapel Street	Spring Street
S. R. 42; U. S. 23 (Moreland Avenue)	Dekalb County Line	A point 0.10 miles south of Custer Avenue
S. R. 42; U. S. 23 (Moreland Avenue)	A point 0.10 miles south of Custer Avenue	Ponce de Leon Avenue
S. R. 42; (Briarcliff Road)	Ponce de Leon Avenue	Dekalb County Line
S. R. 42 CONN. (Freedom Parkway Connector)	State Route 10	State Route 42
S. R. 42 SPUR (McDonough Boulevard)	Moreland Avenue	Jonesboro Road
S. R. 54 (Jonesboro Road)	Clayton County Line	Harper Road
S. R. 54 (Jonesboro Rd., McDonough Blvd., University Ave.)	Harper Road	State Route 401/I-75
S. R. 54 CONN. (Sawtell Avenue)	Jonesboro Road	McDonough Blvd.
S. R. 70 (Fulton Industrial Blvd.)	Aviation Circle	Bankhead Highway
S. R. 139 (Ralph David Abernathy Boulevard)	State Route 14/US 29/ W. Whitehall Street	Martin Luther King Jr. Drive
S. R. 139 (Martin Luther King Jr. Drive)	Ralph David Abernathy Drive	A point 0.10 mile west of Old Gordon Road
S. R. 141 (Peachtree Road)	State Route 9	Dekalb County Line

## Appendix C:

### Collector Streets

#### Alphabetical Listing

Note: Streets listed may also be classified as State or Federal Highways and may be identified by a highway number designation.

STREET NAME	SEGMENT	Miles
Alexander Street, N.E.	Marietta Street to West Peachtree Street	0.47
Arizona Avenue, N.E.	Rogers Street to Dekalb Avenue	0.1
Ashby St, S.W. & N.W.	White Street to West Marietta Street	3.5
Atlanta Avenue, S.E.	Capitol Avenue to Boulevard	1.1
Auburn Avenue, N.E.	Peachtree Street to Randolph Street	1.5
Auburn Avenue, N.E.	Randolph Street to Port Street	0.6
Avon Avenue, S.W.	Lee Street to Cascade Avenue	1.5
Austin Avenue, N.E.	Euclid Avenue to Elizabeth Street	0.3
Bakers Perry Road, S.W.	City Limits to M.L.K. Jr. Dr.	2.0
Baker Road, N.W.	Hightower Road to West North Avenue	0.9
Barge Road, S.W.	Stone Road to Fairburn Road	1.4
Barnett Street, N.E.	Ponce De Leon Avenue to Virginia Avenue	0.6
Beecher Street, S.W.	Donnelly Ave to Benjamin E Maya Drive	2.55
Benjamin E. Mays DR SW	Beecher Road to Fairburn Road	2.95
Berne Street, S.E.	Boulevard South East to Moreland Avenue	1.11
Beverly Road, N.E.	West Peachtree Street to Polo Drive	0.7
Bishop Street, N.E.	Howell Mill Road to Mecaslin Street	0.75
Blackland Road, N.E.	Roswell Road to Northside Drive	1.4
Bohler Road, N.W. ~	West Wesley Road to Defoors Perry Road	1.1
Bolton Road, N.W. - I	Barrett Road. To M.L.K. Dr. Drive	2.2
Bolton Road, N.W.	Coronet Way to Marietta Boulevard	0.3
Bouldercrest Drive, S.E.	Flat Shoals Road to Fayetteville Road	0.85
Boulder Park, S.W.	Fairburn Road to Mendell Drive	1.9
Boulevard, S.E.	North Avenue to Edgewood Avenue	1.1
Boulevard, S.E.	McDonough Blvd to Glenwood Avenue	1.95
Boulevard Drive, N.E.	Moreland Avenue to Candler Road	3.4
Brown Mills Rd, SW & SE	Crown Road to Jonesboro Road	4.2
Butler Street, N.E.	Houston St. to Martin Luther King Jr. Dr.	0.7
Butler Road, S.W.	Tell Road to Campbellton Road	1.3
Carroll Drive, N.W.	Chattahoochee Avenue to Marietta Road	0.6
Centra Villa Drive, S.W.	Cascade Avenue to Campbellton Road	1.0
Chappell Road, N.W.	Bankhead Hwy to M.L.King Jr. Dr.	1.2
Chattahoochee Ave, N.W.	Howell Mill Road to Marietta Boulevard	1.0
Cherokee Avenue, S.E.	Memorial Drive to Atlanta Avenue	1.1
Childress Drive, S.W.	Cascade Road to Campbellton Road	1.6
Claire Drive, S.W.	Lakewood Avenue to Pryor Road	0.85
Clifton Road, N.E.	Ponce De Leon Avenue to Dekalb Avenue	0.8
College Avenue, N.E.	Howard Street to City Limits	0.8
Collier Drive, N.W.	Old Gordon Road to Hightower Road	2.7
Collier Road, N.W.	Defoor Hills Road to Peachtree Street	2.4
Confederate Avenue, S.E.	Boulevard South East to Edie Avenue	0.75
Conley Road, S.E.	Jonesboro Road to City Limits	0.7

Constitution Road, S.E.	Jonesboro Road to Macon Highway	1.0
Continental Colony Pkwy S.W	Greenbriar Parkway to Hogan Road	0.6
County Line Road, S.W.	City Limits to City Limits	0.4
County Line Road, S.W.	Tell Road to City Limits	1.8
Custer Avenue, S.E.	Moreland Avenue to Boulevard	1.1
Defoor Avenue N.W.	Howell Mill Road to Collier Road	1.1
Defoor Ferry Road, N.W.	Collier Road to Coronet Way	1.9
Delmar Lane, N.W.	On Ramp to I-285 East Bound	0.9
Delow Drive, S.W.	Campbellton Road to Cascade Avenue	1.3
Derring Road, N.W.	Northside Drive to Peachtree Street	1.0
Dill Avenue, S.W.	Murphy Avenue to Stewart Avenue	0.9
Dodson Drive, S.W.	City Limits to Cascade Road	1.6
Donnelly Avenue, S.W. -	Lee Street to Cascade Avenue	1.2
East Andrews Drive, N.E.	Roswell Road to West Paces Ferry Road	0.4
East Confederate Ave, S.E.	Edie Avenue to Moreland Avenue	0.8
East Morningside Dr, N.E.	Piedmont Ave to East Rock Spring Rd	0.8
East Paces Ferry Rd, N.E.	Piedmont Road to Roxboro Road	1.15
East Rock Spring Rd, N.E.	Morningside Drive to City Limits	0.8
East Wesley Road, N.E.	Piedmont Road to Peachtree Road	1.3
Ellis Street, N.E.	Piedmont Avenue to Peachtree Street	0.3
Empire Boulevard, S.W.	Oak Drive to Brown Mills Road	0.85
Euclid Avenue, N.E.	Moreland Avenue to Austin Avenue	0.2
Fair Street, S.W.	Walker Street to Lawton Street	1.15
Fairburn Road, S.W.	City Limits to Bolton Road	3.35
Fairburn Road, S.W.	City limits to City Limits	4.1
Fayetteville Road, S.E.	Flat Shoals Road to Bouldercrest Drive	0.65
Flat Shoals Avenue, S.E.	Moreland Avenue to Bouldercrest Drive	1.1
Fiat Shoals Road, S.E.	Bouldercrest Drive to Fayetteville Road	0.85
Forrest Park Road, S.E.	Thomasville Drive to Conley Road	3.5
Forsyth Street, N.W.	Whitehall Street to Peachtree Street	0.9
Fort Street, N.E.	Irwin Street to Auburn Avenue	0.2
Fulton Street, S.E.	Capitol Avenue to Connally Street	0.35
Fulton Street, S.W. -	Humphries Street to Pryor Street	0.6
Garmon Road, N.W.	Mount Paran Road to City Limits	0.6
Georgia Avenue, S.E.	Capitol Avenue to Cherokee Avenue	0.75
Gilbert Road, S.E.	Brown Mills Road to City Limits	1.1
Glen Irish Drive, N.E.	Highland Ave to Ponce De Leon Avenue	0.8
Gordon Street, S.W.	Martin Luther King Jr. Dr to Cascade	1.1
Greenbrier Parkway, S.W.	Campbellton Road to Barge Road	1.4
Habersham Road, N.E.	Peachtree Battle Avenue to Roswell Road	2.8
Harbin Road, S.W.	Cascade Road to Campbellton Road	1.3
Hapeville Road, S.W.	Cleveland Avenue to Oak Drive	0.8
Harwell Road, N.W.	Bankhead Highway to Collier Drive -	1.3
Hemphill Avenue, N.W.	Northside Drive to 10th Street	0.40
Hill Street, S.E.	Milton Avenue to Glenwood Avenue	1.65
Hills Avenue, N.W.	Chattahoochee Ave to Defoor Hills Road	0.4
Hillside Drive, N.E.	Powers Ferry Road to Northside Drive	0.8
Highland Avenue, N.E.	Alaska Avenue to Piedmont Avenue	1.14
Hightower Road, N.W.	Bankhead Hwy to James Jackson Pkwy	1.1
Hogan Road, S.W.	City Limits to Continental Colony Pkwy	0.4
Hogan Road, S.W.	Fairburn Road to Stone Road	1.2

Hollywood Road, N.W.	Bolton Road to Bankhead Highways	3.0
Houston Street, N.E.	Butler Street to Peachtree Street	0.4
Howard Street, N.E.	College Avenue to Boulevard Drive	0.6
Huff Road, N.E.	Howell Mill Road to Marietta Boulevard	1.0
Hutchens Road, S.E.	Forrest Park Road to Jonesboro Road	1.1
Irwin Street, N.E.	Lake Avenue to Fort Street	1.0
Jackson Street, N.E.	Decatur Street to Highland Avenue,	0.7
James P Brawley Dr., S.W.	Greensferry Avenue to Bankhead Highway	1.75
Jefferson Street, N.W.	Ashby Street to South West Connector	0.45
Jett Road, N.E.	Powers Ferry Road to City Limits	0.6
Johnson Road, N.W.	Hollywood Road to Perry Boulevard	1.3
Johnson Road, N.E.	Lenox Road to Briar Cliff Road	0.8
Kimberly Road, S.W.	Campbellton Road to Melvin Drive	0.9
Kimberly Road, S.W.	City Limits to City Limits	0.59
Lake Avenue, N.E.	Elizabeth Street to Irwin Street	0.4
Lake Forrest Drive, NW.	Powers Ferry Road to City Limits	2.6
Lakewood Avenue, S.E.	Claire Drive to Milton Avenue	1.1
Lakewood Way, S.E.	Pryor Road to Lakewood Avenue	0.4
Langston Avenue, S.W.	Sylvan Road to Murphy Avenue	1.0
Lawton Street, S.W.	Fair Street to Donnelly Avenue	1.15
Lee Street, S.W.	White Street to West End Avenue	0.8
Lenox Road, N.E.	Cheshire Bridge Road to East Rock Spring	1.45
Lenox Road, N.E.	Peachtree Road to Buford Highway	1.8
Linkwood Road, N.W.	Collier Dr to Martin Luther King Jr. Drive	0.7
Luckie Street, N.W.	North Avenue to Forsyth Street	1.1
Lynhurst Drive, S.W.	Martin Luther King Jr. Dr to Cascade Road	2.2
McDaniel Street, S.W.	Northside Drive to University Avenue	1.7
McLendon Avenue, N.E.	Moreland Avenue to City Limits	1.8
McWilliam Road, S.E.	Brown Mills Road to Forrest Park Road	0.75
Macon Drive, S.W.	Mount Zion Road to Cleveland Avenue	0.6
Marietta Road, N.W.	Perry Boulevard to Bolton Road	2.7
Mason Turner Road, S.W.	Simpson Road to Chappell Road -	0.19
Maynard Terrace, S.E.	Glenwood Avenue to Memorial Drive	0.5
Mecaslin Street, N.E.	Bishop Street to Derring Road	0.2
Milton Avenue, S.E.	Capitol Avenue to Hill Street	0.7
Mitchell Street, S.W.	Martin Luther King Jr., Dr to Magnum St.	0.4
Moore's Mill Road, N.W.	Bolton Road to West Paces Ferry Road	3.4
Montgomery Ferry Rd, N.E.	Polo Drive to Piedmont Ave	0.6
Monroe Drive, N.E.	Piedmont Cir to Ponce De Leon Ave	3.1
Mount Gilead Road, S.W.	Fairburn Road to Campbellton Road	1.2
Mount Paran Road, N.W.	City Limits to Paces Ferry Road	2.9
Mount Zion Rd, S.W. & S.E.	Stewart Avenue to Brown Mills Road	1.4
Murphy Avenue, S.W.	Glenn Street to Dill Avenue	1.55
Niskey Lake Road, S.W.	Campbellton Road to County Line Road	1.14
North Avenue, N.E.	Bonaventure Avenue to Oakdale Road	1.1
North Highland Ave, N.E.	East Rock Spring to Alaska Avenue	2.95
Northside Drive, N.W.	Northside Parkway to City Limits -	3.0
Northwest Drive, N.W.	Bolton Road to Hightower Road	1.45
Oakdale Road, N.E.	Dekalb Avenue to City Limits	1.35
Oakland Drive, S.W.	Richland to Campbellton Road	0.8
Old Ivy Road, N.E.	Piedmont Road to Wieuca Road	1.2
Old Hapeville Road, S.W.	Macon Drive to Cleveland Avenue	0.6

Ormond Street, S.E.	Cherokee Avenue to Capitol Avenue	0.75
Parkway Drive, N.E.	Highland Ave to Ponce De Leon Avenue	0.8
Parrott Avenue, N.W.	Bolton Road to Bolton Road	1.0
Peachtree Battle Ave, N.W.	Moore's Mill Road to Peachtree Road	3.2
Peachtree Center Ave N.E.	Edgewood Avenue to Peachtree Street	0.6
Perkerson Road, S.W.	Stewart Avenue to Sylvan Road	1.3
Perry Boulevard, N.W.	Southwest Connector to Hollywood Road	2.9
Peyton Road, S.W.	Benjamin E Mays Drive to M.L.K. Jr. Drive	2.2
Pharr Road, N.E.	Peachtree Road to Piedmont Road	0.75
Piedmont Circle, N.E.	Piedmont Avenue to Monroe Drive	0.1
Polo Drive, N.E.	Beverly Road to Montgomery Ferry Road	0.2
Poole Creek Road, S.W.	Jonesboro Road to Brown Mills Road	1.6
Powers Ferry Road, N.W.	Roswell Road to City Limits	1.9
Pryor Road, S.W.	University Avenue to Lakewood Way	1.6
Ralph McGill Blvd, N.E.	North Avenue to Peachtree Street	2.2
Randolph Street, N.E.	Auburn Avenue to Highland Avenue	0.35
Ridgewood Road, N.W.	Paces Ferry Road to Moore's Mill Road	2.5
Rogers Street, N.E.	Boulevard Drive to Arizona Avenue	0.5
Sandtown Road, S.W. -	Venetian Drive to Cascade Road	1.0
Simpson Road, N.W.	Collier Road to Marietta Street	4.2
S. River Industrial Blvd SE	Forrest Park Road to City Limits	0.6
Stone Hogan Connector SW	Stone Road to City Limits	0.4
Stone Road, S.W.	Fairburn Road to City Limits	1.8
Sydney Street, S.E.	Connelly Street to Cherokee Avenue	0.4
Sylvan Road, S.W.	Murphy Avenue to City Limits	1.9
Techwood Drive, N.W.	10th Street to 16th Street	0.6
University Avenue, S.W.	Stewart Avenue to Ridge Avenue	1.1
Veltre Circle, S.W.	Cascade Road to Benjamin E Mays Drive	0.7
Venetian Drive, S.W.	Cascade Avenue to Campbellton Road	2.0
Virginia Avenue, N.E.	North Highland Avenue to Monroe Drive	0.75
Waters Road, S.W.	Cleveland Avenue to Hapeville Road	0.4
Wells Street, S.W.	Glenn Street to Humphries Street	0.3
West Lake Avenue, N.W.	Bankhead Hwy to MLK Jr. Dr.	1.5
West North Avenue, N.W.	Baker Road to Chappell Road	1.35
West Peachtree Place, NW	Alexander Street. to Peachtree Street	0.38
West Wesley Road, N.W.	Peachtree Road to Ridgewood Road	3.9
West Wieuca Road, N.W.	Loridans Drive to Lake Forrest Drive	0.9
Westmont Road, S.W.	Venetian Drive to Beecher Street	1.3
Westview Drive, N.W.	Cordon Street to West End Avenue	1.7
Weyuan Avenue, S.W.	Capitol Avenue to Ridge Avenue	0.1
White Street, S.W.	Cordon Street to Ashby Street	0.95
Whitefoord Avenue, N.E.	Memorial Drive to Dekalb Avenue	1.0
Wieuca Road, N.E.	Peachtree Road to Loridans Drive	1.6
Willis Mill Road, S.W.	Cascade Road to Campbellton Road	1.3
Wyman Street, N.E.	Memorial Drive to Boulevard Drive	0.4
Zip Industrial, S.E.	Poole Creek Road to Brown Mills Road	0.7
10th Street, N.W.	Monroe Drive to Howell Mill Road	2.4
14th Street, N.W.	Howell Mill Road to Juniper Street	1.7
<b>TOTAL # of Streets = 195</b>	<b>Total # of Miles</b>	<b>246.67</b>

## **Appendix D:**

### **Time of Day Restrictions for working in the right-of-way**

#### **Noted: Include working in inclement weather section**

In an effort to minimize the negative effects of noise and traffic congestion caused by construction activities, Time of Day Limitations are imposed on construction activities in certain area of the City.

Unless specifically stipulated otherwise by a written permit from the City of Atlanta:

- No lane of any arterial street shall be blocked for any period between 7:00 AM and 9:00 AM or between 4:00 PM and 6:00 PM.
- No lane of any arterial street shall be blocked for any period exceeding 1 hour between 9:00 AM and 4:00 PM unless a uniformed police officer is employed on site to direct traffic.
- No lane of any street in a commercial or retail zone shall be blocked for any period exceeding 1 hour between 7:00 AM and 6:00 PM.
- No nighttime activities in residential areas, define language 10:00 PM to 7:00 AM excluding maintenance that does not exceed – define levels which requires a noise variance. [74.135 Section](#)
- No activities that create an unacceptable level of noise, dust, or disruption to normal activities of the population

#### **Exceptions to Time of Day Restrictions**

In the event of a legitimate emergency, time of day restrictions may be waived.

#### **Emergency**

In order to be recognized as an emergency for the waiver of time of day restrictions one or more of the following restrictions must exist:

- Immediate danger to life, health, or property.
- Immediate threat of environmental damage.
- Necessity to repair damage to essential facilities resulting from extreme weather events or traffic accidents.
- Loss of service to customers.
- Immediate response to the problem will result in significantly reduced inconvenience to the public in the long term.
- Delay of repair will result in further damage to facilities.
- Other extraordinary condition that can be documented as an emergency.

Within 24 hours of the occurrence of the emergency, or at the beginning of the next business day, the facility owner must notify the Department of Public Works of the location and nature of the emergency and submit the following as appropriate:

Permit has to be submit within 5 days

- Notice and explanation of any threat to public health or safety.
- Notice and explanation of any threat of environmental damage.
- An engineering plan meeting the Department of Public Works standards, illustrating the work done or remaining to be done.
- A schedule of activities.
- Payment of applicable fees

Additional requirements may apply, depending on the specific circumstances of the event.

## **Appendix E:**

### **Public Notification Sign**

- Signs to be Posted Prior to Construction and to Remain In Place during Construction
- Signs must be Visible and Legible to Vehicles and Pedestrians Traveling in either direction.
- Signs and Lettering should be sized appropriate to Location
- Signs must have a surface area of not less than 3 square feet.
- Lettering must be legible block letters not less than 2" high.

*(Example)*

*Water Main Construction*

Work Performed by (Name of Contractor)

Under Contract to (Name of Owner)

Begin Construction: (Date)

Project Duration (# of Days)

Address questions and complaints to

(Owner's representative and telephone #)

24-Hour Emergency Contact (Telephone #)

Vehicle Identification Signs (refer to GDOT 3.12)

To be displayed in front or rear windshield on each vehicle used on a construction site.

Standard Size: 8 ½" X 11"

Vehicle Identification Signs must be consistent with the Type of Work in Progress



Working under Permit from  
City of Atlanta

General Construction  
In the Public Right-of-Way

(Name of Contractor)

Under Contract to (Name of Owner)

24-Hour Emergency Contact  
(Telephone #)

Working under Permit from  
City of Atlanta

Emergency Utility Repair  
In the Public Right-of-Way

(Name of Contractor)

Under Contract to (Name of Owner)

24-Hour Emergency Contact  
(Telephone #)

Working under Permit from  
City of Atlanta

Scheduled Utility Maintenance  
In the Public Right-of-Way

(Name of Contractor)

Under Contract to (Name of Owner)

24-Hour Emergency Contact  
(Telephone #)

## **Appendix F:**

### **Areas of Special Impact**

Note: City of Atlanta Code of Ordinances - Section 138-126 (i.) In this Code Section, the term “Peachtree Corridor” is used in lieu of the term “Areas of Special Impact”. Until this code section is updated, the terms will be interpreted as being interchangeable.

For the purpose of determining Telecommunication Franchise and Revocable License fees and permits, areas of Special Impact (Peachtree Corridor) shall include:

- Buckhead High Impact Area
- Downtown High Impact Area
- Peachtree/Piedmont/Lindberg High Impact Area

#### **Peachtree/Piedmont/Lindberg High Impact Area**

1. All of the City’s public right-of-way of Peachtree Street and Peachtree Road between Interstate Hwy 85 and Pharr Road
2. All of the City’s public right-of-way of Piedmont Road between 14<sup>th</sup> Street and Pharr Road
3. All of the City’s public right-of-way of Lindberg Drive between Peachtree Road and Piedmont Ave

#### **Buckhead High Impact Area**

All of the City’s public right-of-way within an area bounded as follows:

1. Beginning at the Point of Intersection of the southern right-of-way of Pharr Road and the western right-of-way of Peachtree Road, said point being the Point of Beginning,
2. Hence, running northerly along the western right-of-way of Peachtree Road to its intersection with West Paces Ferry Road and Roswell Road,
3. Hence, running northerly along the western right-of-way of Roswell Road to the intersection of Piedmont Road,
4. Hence, running southerly along the eastern right-of-way of Piedmont Road to the intersection of Buckhead Loop,
5. Hence, running easterly along the northern right-of-way of Buckhead Loop to the intersection of Phipps Boulevard,
6. Hence, running northeasterly along the northwestern right-of-way of Phipps Boulevard to the intersection of Wieuca Road,
7. Hence, running southerly along the eastern right-of-way of Wieuca Road to the intersection of Peachtree Street,

8. Hence, running easterly along the northern right-of-way of Peachtree Road to the intersection of Roxboro Road,
9. Hence, running along the eastern right-of-way of Roxboro Road to the Southern Railway crossing,
10. Hence, running westerly along the Southern Railway right-of-way to the crossing of Ga. Hwy 400,
11. Hence, along the western right-of-way of Ga. Hwy 400 to the intersection of Peachtree Road;
12. Hence, running southwesterly along the southern right-of-way of Peachtree Road to the intersection of Piedmont Road,
13. Hence, running southerly along the eastern right-of-way of Piedmont Road to the intersection of Pharr Road,
14. Hence, running westerly along the southern right-of-way of Pharr Road to the intersection of Peachtree Road, and the Point of Beginning.
15. All of the area thus described, lying within the Corporate Limits of the City of Atlanta, 17<sup>th</sup> District, Fulton County, Georgia.

### **Downtown High Impact Area**

All of the City's public right-of-way within an area bounded as follows:

1. Beginning at the Intersection of the southern right-of-way of Martin Luther King Jr. Drive and the western right-of-way of Northside Drive, said point being the Point of Beginning,
2. Hence, running northerly along the western right-of-way of Northside Drive to the intersection of Interstate Hwy 75,
3. Hence, running easterly along the northern right-of-way of Interstate Hwy 75 and continuing easterly along the northern right-of-way of Interstate 85 to the intersection of Peachtree Street,
4. Hence, running easterly and southerly along the northern and eastern right-of-way of Peachtree Street to the intersection of 14<sup>th</sup> Street,
5. Hence, running easterly along the northern right-of-way of 14<sup>th</sup> Street to the intersection of Piedmont Avenue,
6. Hence, running southerly along the eastern right-of-way of Piedmont Avenue to the intersection of Interstate Hwy 75/85 (Downtown Connector),
7. Hence, running southerly along the eastern right-of-way of Hwy 75/85 (Downtown Connector) to the intersection of Memorial Drive,
8. Hence, running along the southern right-of-way of Memorial Drive to the intersection of Spring Street,
9. Hence, running northerly along the right-of-way of Spring Street to the intersection of Martin Luther King, Jr. Drive and the point of beginning.
10. All of the area thus described, lying within the Corporate Limits of the City of Atlanta, 17th District, Fulton County, Georgia.

### **Peachtree/Piedmont/Lindberg High Impact Area**

1. All of the City's public right-of-way of Peachtree Street and Peachtree Road between the intersections of Interstate Hwy 85 on the south and Pharr Road on the north; and
2. All of the City's public right-of-way of Piedmont Road between 14<sup>th</sup> Street on the south and Pharr Road on the north; and
3. All of the City's public right-of-way of Lindberg Drive between Peachtree Road on the west and Piedmont Ave. on the east;
4. All of the area thus described, lying within the Corporate Limits of the City of Atlanta, 17<sup>th</sup> District, Fulton County, Georgia.

## **Appendix G: Requirements for street, sidewalk and lane closure permit**

### Procedures for Granting Full Street and Lane Closure Permits for Construction Purposes

- Applications are either faxed or brought in personally to the Office of Transportation.
- The applications are dated, stamped, and assigned to the Permit Engineer.
- The applications shall indicate the time (in days); the length (in feet); the number of lanes and purpose of the closure
- All permits are approved for operations during the off-peak hours of 9 a.m. to 4 p.m.
- Work done between the hours of 6 pm and 10 pm is approved by the Commissioner of Public Works. Work done between the hours of 10:01 p.m. and 9 a.m. is governed by Article IV. Noise Control – Section 74 of the City of Atlanta Code of Ordinances. Section 74 – 139 permits the condition for the temporary variance.

#### **Full Street closures lasting up to 90 Days:**

Full street closure permits require 96 hours notice prior to the commencement of the project. The following additional information is required prior to being approved:

1. A copy of detour route with signage and traffic management plan as per the Manual of Uniform Traffic Control Devices (MUTCD)
2. A copy of notification letter to residences and businesses within a 3 block radius informing them of the closure at least five (5) business days prior to the proposed closure.
3. A signed and dated letter (by the applicant) listing residences and businesses that were notified about the closure.
4. All residences and businesses affected by the closure must be notified.

#### **Full Street closures lasting between 90 Days and 6 months:**

1. A 30 calendar day notification will be provided by the applicant to businesses and residents that are located on or have access points on the street that is proposed for closure within a 1 block radius.
2. The applicant will be required to mail or hand delivery, a copy of the notice to the impacted Neighborhood Planning Unit and neighborhood association representing the impacted street 30 calendar days prior to closure.
3. Businesses and/or residents, impacted Neighborhood Planning Units and/or neighborhood association within a 3 block radius should be notified at least 15 calendar days in advance.

4. The applicant will be required to obtain signatures of receipt by the business owners, single family home owners or residents, signatures of the impacted property's managers or authorized representative of multi-family dwellings such as apartments and condominiums.
5. The applicant will be required to submit a copy of the document signed by impacted businesses and residents as outlined above.

The applicant will be required to submit a sworn affidavit stating that he or she complied with notification requirements outlined above.

**Full Street closures lasting longer than 6 months:**

1. A 45 calendar day notification will be provided by the applicant to businesses and residents that are located on or have access points on the street that is proposed for closure within a 1 block radius.
2. The applicant will be required to mail or hand delivery, a copy of the notice to the impacted Neighborhood Planning Unit and neighborhood association representing the impacted street 45 calendar days prior to closure
3. Businesses and/or residents, impacted Neighborhood Planning Units and/or neighborhood association located within a three (3) block radius should be notified at least 30 calendar days in advance.
4. The applicant will be required to obtain signatures of receipt by the business owners, single family home owners or residents, signatures of the impacted property's managers or authorized representative of multi-family dwellings such as apartments and condominiums.
5. The applicant will be required to submit a copy of the document signed by impacted businesses and residents as outlined above.

The applicant will be required to submit a sworn affidavit stating that he or she complied with notification requirements outlined above.

The Office of Transportation shall attach a cover letter addressed to the applicant and copied to the Fire Chief; the Chief of Police; Grady memorial Hospital; MARTA; the Atlanta Board of Education. This correspondence should be dated and faxed at least 72 hours before commencement of the project.

- Lane closures shall require a minimum of 24 hours notice prior to the commencement of the project, and require traffic control plan per the MUTCD and Police Officers. The safety of the public must be maintained at all times. With the exception of single lane closure that are the result of routine maintenance and repair for a limited duration of time and scope.

- Lane closure permits are issued between the hours of 8:30 a.m. and 1 p.m. Mondays to Fridays.

## **Street, Sidewalk & Lane Closures for Franchise Utilities are issued in PWOPS**

### **Appendix H:**

#### **Utility Permits Issuance Process**

1. Request is received by the Traffic Engineering Section from the Utility Company (4 copies)
  - a. Two copies are reviewed for compliance with city code. Are profiles and/or plans (horizontal as well as vertical locates) included, if required based upon method of construction. To be reviewed within 10 business days of receiving the permit.
  - b. The lane or street closure requests can be reviewed and issued within 10 business days after step (a) above.
  - c. A copy is given to the inspector assigned to that Utility Company, to do a preliminary review of the request. The inspector denotes any differences or possible concerns i.e. vaults in the sidewalk, brick pavers etc. not noted on plans. The inspector also determines if any other company is currently working at or in close proximity to the requested location. To be reviewed and return within 15 business days of step (a) above.
2. After traffic permits from Traffic Operations and preliminary reviews from inspectors in Street Operations are received, i.e. a maximum of 15 business days, the Street Operations Unit's database is checked for open permits at the requested location. Checks are also made by the inspector for any unresolved issues with the requestor, which will impact issuance of the requested permits. If no conflicts are found the permits must be issued, per section 138-65 of the city code, within 60 days.
  - a. If there are problems, in sections 1 (a)-(c) make the requestor aware of them via email, U.S. Mail or by telephone within 20 business days from receipt of the permit.
  - b. If there is open permit at the location, a second permit shall not be issued unless an exception is granted by the Department of Public Works. Wait until the existing permit is closed, by the inspector, before issuing another permit. If after 60 days the permit has not been completed, notify the requestor in writing (as to why the permit has not been issued) via email or by U. S. Mail.
  - c. If there are no problems, stamp, date and sign (include cost, if applicable) two copies and deliver them to the permit clerk before 4:00 p.m. Timeframe for issuance by section 138-65 of the city code of ordinances, no longer than 60 days.

- d. The permit clerk calls the contact person listed on the permit, informing them the permit is being issued.
- e. The permit clerk provides the requestor with the Department of Public Works permit (1 copy) and also provides Public Works with the same permit (1 copy) with drawings. The packet is given to inspector monitoring the Utility Company until completion.

**Street, Sidewalk & Lane Closures for Franchise Utilities are covered in PWOPS**



## Part III

# IIREA Preview Participation Program

## **DEPARTMENT OF PROCUREMENT**

### **IIREA PREVIEW PARTICIPATION FORM INSTRUCTIONS**

1. Potential offerors may submit the Contractor Affidavit to the Department of Procurement (“DOP”) not less than ten (10) days prior to the due date for responses to a Solicitation. Submission of the Contractor Affidavit after that date will **NOT** extend the time for submitting Bids/Proposals (“offers”) and DOP is not required to review Contractor Affidavits submitted less than ten (10) days prior to the due date for responses to a Solicitation.
2. All Contractor Affidavits must be submitted via email or delivery to the following address:  
**Email: iireapreview@atlantaga.gov**  
**City of Atlanta**  
**Department of Procurement**  
**ATTN: IIREA Preview**  
**55 Trinity Avenue, SW, Suite 1900**  
**Atlanta, GA 30303**
3. DOP will review the timely submitted Contractor Affidavit and provide a response not less than five (5) days prior to the due date for responses to the solicitation.
4. Potential offerors that are deemed non-compliant must submit a compliant contractor Affidavit on the due date for responses to the solicitation of offers in order to be qualified for evaluation.
5. If a due date for the Contractor Affidavit or the acknowledgement and determination falls on a weekend or a City recognized holiday, the document shall be due on the next business day after the weekend or holiday. However, DOP shall not be required to change the due date for Proposals to accommodate a later due date for the Contractor Affidavit. In no event will the due date for the Contractor Affidavit be later than the due date for responses to the solicitation.
6. The determination of a potential offeror’s compliance with the State’s immigration compliance mandates shall not automatically deem that offeror’s timely submitted offer to be responsive to any solicitation. Offerors must also be responsive to and compliant with other requirements set forth in the solicitation of offers, as well as all applicable laws. Untimely offers from compliant potential offerors shall not be eligible for award of the solicited contract.
7. Potential offerors that submit an incomplete or incorrect Contractor Affidavit with their offer or fail to submit a compliant Contractor Affidavit after a determination of non-compliance, will not be qualified for evaluation and their timely submission of an offer may not be considered for the award of the solicited contract

**DEPARTMENT OF PROCUREMENT**  
**IIREA PREVIEW PARTICIPATION FORM**

Date of Request	
Name of Requestor (company name)	
Mailing Address	
Contact Person	
Phone	
Email	

**Project Name and Number:** \_\_\_\_\_

**Bid/Proposal Due Date:**

\_\_\_\_\_

**Confirm E-Verify affidavit completed and attached:** ☐ Yes ☐ No