

PROJECT MANUAL

**RIVERVIEW PARK/CGCC CHRONIC SSO
ELIMINATION PROJECT**

CONTRACT NO. W-19-015-201



MAYOR AND CITY COUNCIL

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District 1 – Chip Henderson, Chair
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**CITY OF
CHATTANOOGA, TENNESSEE**
November 16, 2020



**RIVERVIEW PARK/CGCC CHRONIC SSO
ELIMINATION PROJECT**

**CITY OF
CHATTANOOGA, TENNESSEE**

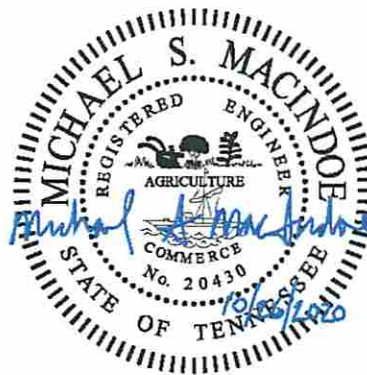
CITY OF CHATTANOOGA
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CERTIFICATION AND SEAL

I hereby certify that the Project Drawings and the Contract Documents and Specifications for the following contract were prepared by me or under my direct supervision, and I am a duly registered engineer under the laws of the state in which these projects are located:

RIVERVIEW PARK/CGCC CHRONIC SSO
ELIMINATION PROJECT

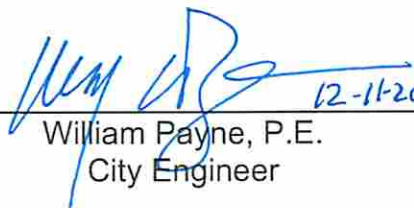
CONTRACT NO. W-19-015-201



Tennessee P.E. Number 20430

(Date)

APPROVED FOR RELEASE



12-11-2020
William Payne, P.E.
City Engineer

SPECIFICATIONS

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**RIVERVIEW PARK/CGCC CHRONIC SSO ELIMINATION PROJECT
CONTRACT NUMBER W-19-015-201**

CITY OF CHATTANOOGA, TENNESSEE

Sealed Bids for furnishing all materials, labor, tools, equipment and appurtenances necessary for the construction of the Riverview Park/CGCC Chronic SSO Elimination Project will be received at the City of Chattanooga at City Hall, Purchasing Department, Suite G13, 101 East 11th Street, Chattanooga, TN 37402, until 2:00 p.m., local time, on Thursday, February 11, 2021, and then at said office publicly opened and read aloud.

A Pre-Bid Conference is scheduled for Tuesday, January 26, 2021, at 11:00 A.M., local time, [Join with Google Meet](#) meet.google.com/geq-mtrq-ytb, [Join by phone](#) (US) +1 570-416-2851 PIN: 462 259 418#.

The Project work to be bid on is as follows: Replace approximately 2,562 linear feet of 15-inch gravity sewer by pipe burst and open cut replacement. Pipe burst includes approximately 748 linear feet of upsize from 15-inch to 28-inch (OD) using HDPE DR17 pipe. Open cut replacement includes approximately 1,814 linear feet of 24-inch PVC sewer. Work also includes installation of nine (9) new 5-foot diameter precast concrete manholes (includes one drop manhole) with watertight frame and cover; one vented manhole; one creek crossing with 36-inch steel casing and 24-inch carrier pipe; rehabilitation of two (2) manholes; temporary bypass pumping; and site restoration.

The Project allotted time for construction is: 240 calendar days

The Instructions to Bidders, Bid, Contract Agreement, Drawings, Specifications and forms of Bid Bond, Performance Bond, Payment Bond and other Contract Documents may be examined at the following:

City of Chattanooga
Purchasing Department
101 E. 11th Street, Suite G13
Chattanooga, Tennessee 37402
423-643-7230

Fulghum, MacIndoe & Associates, Inc.
10330 Hardin Valley Rd., Suite 201
Knoxville, TN 37932
(865) 690-6419

Associated General Contractors of Tennessee
AGC Chattanooga Office
101 W 21st Street
Chattanooga, TN 37408
423-265-1111

Chattanooga Times Free Press
400 East 11th Street
Chattanooga, TN 37403
423-756-6900

Contract Documents may be purchased by check in the amount of the non-refundable deposit of \$100.00 per set. The check should be made out to the City of Chattanooga and mailed to the City of Chattanooga Purchasing Department, 101 East 11th Street, Suite G13, Chattanooga, TN 37402. Prior to mailing the check you can scan and email a copy to bidinfo@chattanooga.gov.

Once the email has been received with a copy of the check the requested bid documents will be emailed.

Each Bid must be accompanied by a Bid Bond, prepared on the form of Bid Bond attached to the Contract Documents or a Surety Company's Standard Bid Bond, duly executed by the Bidder as principal and having as surety thereon a surety company licensed to do business in the State of Tennessee and listed as a certified company in the latest issue of U.S. Treasury Circular 570, in the amount of five percent of the Bid.

No bid may be withdrawn within 120 calendar days after the scheduled time for receipt of bids.

All bidders must be licensed and shall comply with all requirements of the State of Tennessee Contractor's Licensing Act.

Visit City website at: www.chattanooga.gov/general-services/purchasing/bidssolicitations for specific contract information.

The City of Chattanooga is an Equal Opportunity Employer.

Any contract or contracts awarded under this Advertisement for Bids are expected to be funded with local funds in addition to funds indicated elsewhere.

The Owner will in no way be liable for any costs incurred by any bidder in the preparation of its Bid in response to this Invitation to Bid.

The successful Bidder for this Contract will be required to furnish a satisfactory Performance Bond and Payment Bond each in the amount of 100 percent of the Bid.

The Owner reserves the right to reject any or all Bids, to waive informalities and to readvertise.

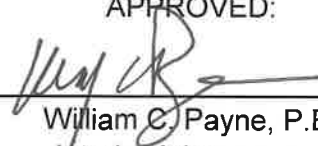
CITY OF CHATTANOOGA, TENNESSEE

RECOMMENDED FOR APPROVAL:



Dennis Malone
Assistant City Engineer
Department of Public Works

APPROVED:



William C. Payne, P.E.
Interim Administrator
Department of Public Works

END OF SECTION

ARTICLE 1 – DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office* – The office from which the Bidding Documents are to be issued and where the bidding procedures are to be administered. The issuing office for this Project is City of Chattanooga Purchasing Department, 101 East 11th Street, Suite G13, Chattanooga, TN 37402.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the advertisement or invitation to bid may be obtained from the Issuing Office.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 The minimum qualifications of a responsible Bidder includes the following requirements:
- A. The Bidder shall maintain a permanent place of business. This requirement applies to the Bidder where the Bidder is a division of a corporation, or where the Bidder is 50 percent or more owned by a person, corporation or firm.
- B. The Bidder is licensed by the State of Tennessee to perform the work under this contract.
- C. The Bidder shall demonstrate adequate construction experience and sufficient equipment resources to properly perform the work under and in conformance with the Contract Documents. This evaluation will be based upon a list of completed or active projects and a list of construction equipment available to the Bidder to perform the work. The Owner may make such investigations as deemed necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may reasonably request. The Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the Project contemplated therein. Adequate construction experience, for the purposed of this Project, shall mean meeting the experience requirements contained in Section 33 01 30.76, Article 1.03.

- D. The Bidder shall demonstrate financial resources of sufficient strength to meet the obligations incident to the performance of the work covered by these Contract Documents. The ability to obtain the required Performance and Payment Bonds will not alone demonstrate adequate financial capability.
 - E. The Bidder shall demonstrate that he is familiar with the work covered by these Contract Documents.
- 3.02 To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit with the Bid written evidence such as previous experience, present commitments, and such other data as may be called for below.
- A. Completion of Statement of Bidder's Qualifications, as included elsewhere in this Project Manual.
 - B. Bidder's Tennessee contractor license number and classification.
- 3.03 To demonstrate Bidder's qualifications to perform the Work, within three days of Owner's request, Bidder shall submit written evidence such as financial data and such other data as may be requested by Owner.
- 3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.
- 3.05 A Bidder may be deemed as not responsible if:
- A. Bidder fails to furnish adequate information for the Owner to determine if the Bidder is qualified.
 - B. Bidder fails to furnish information, evidence, and statements of the principal owner when the Bidder is owned 50 percent or more by another firm, corporation, or person.
 - C. Bidder is in arrears on any existing contracts, interested in any litigation against the City or having defaulted on a previous contract.
 - D. Bidder fails to have access to adequate equipment.
 - E. Bidder has uncompleted work which in the judgment of the City will hinder or prevent prompt completion of additional work, if awarded.

ARTICLE 4 – EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

4.01 *Subsurface and Physical Conditions*

- A. The Supplementary Conditions identify:
 - 1. Those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site.

2. Those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
- B. Copies of reports and drawings referenced in Paragraph 4.01.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.02 of the General Conditions has been identified and established in Paragraph 4.02 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any “technical data” or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

4.02 *Underground Facilities*

- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

4.03 *Hazardous Environmental Condition*

- A. The Supplementary Conditions identify any reports and drawings known to Owner relating to a Hazardous Environmental Condition identified at the Site.
- B. Copies of reports and drawings referenced in Paragraph 4.03.A will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the “technical data” contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.06 of the General Conditions has been identified and established in Paragraph 4.06 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any “technical data” or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

- 4.04 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 4.06 of the General Conditions.

- 4.05 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.

- 4.06 Reference is made to Article 7 of the Supplementary Conditions for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of contract documents (other than portions thereof related to price) for such other work.
- 4.07 It is the responsibility of each Bidder before submitting a Bid to:
- A. examine and carefully study the Bidding Documents, and the other related data identified in the Bidding Documents;
 - B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
 - C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;
 - D. carefully study all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Paragraph 4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in the Paragraph 4.06 of the Supplementary Conditions as containing reliable "technical data";
 - E. consider the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs;
 - F. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
 - G. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
 - H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and
 - I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.

- 4.08 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 – PRE-BID CONFERENCE

- 5.01 A Pre-Bid Conference will be held if so indicated in the Advertisement for Bids. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 6 – SITE AND OTHER AREAS

- 6.01 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Owner in writing. Interpretations or clarifications considered necessary by Owner in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Owner as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or Engineer.
- 7.03 Questions and other inquiries shall be submitted to the City of Chattanooga Purchasing Department, 101 East 11th Street, Suite G13, Chattanooga, TN 37402 and shall utilize the Request for Bidder Information which follows this section.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of five percent of Bidder's maximum Bid price and in the form of a certified check or cashier's check, a Bid bond (on the form attached or on a surety company's standard bid bond form) issued by a surety meeting the requirements of Paragraphs 5.01 and 5.02 of the General Conditions.
- 8.02 If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within ten days after the Notice of Award, Owner may

consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.

- 8.03 Attorneys-in-Fact of other officers who sign bid bonds for a surety company must file with such bonds a certified copy of his power of attorney authorizing him to sign said bonds.

ARTICLE 9 – CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS

- 11.01 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents. No substitution requests will be considered.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS AND OTHERS

- 12.01 If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, individuals, or entities to be submitted to Owner in advance of a specified date prior to the Effective Date of the Agreement, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute without an increase in the Bid.
- 12.02 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.

- 12.03 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form is included with the Bidding Documents.
- 13.02 All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each Bid item and alternate item listed therein. In the case of optional alternatives the words “No Bid,” “No Change,” or “Not Applicable” may be entered.
- 13.03 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown.
- 13.04 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown.
- 13.05 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
- 13.06 A Bid by an individual shall show the Bidder’s name and official address.
- 13.07 A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
- 13.08 All names shall be printed in ink below the signatures.
- 13.09 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 13.10 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

ARTICLE 14 – BASIS OF BID; COMPARISON OF BIDS

14.01 Lump Sum and Unit Prices

- A. Bidders shall submit a bid on a lump sum or unit price basis, as indicated on the Bid schedule, for each item of Work listed in the Bid schedule.
- B. The total of all estimated prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with Paragraph 11.03 of the General Conditions.

- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

14.02 Allowances

- A. For cash allowances the various other Bid prices shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 11.02.B of the General Conditions.

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 With each set of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, Bid Bond Form and the required documents listed below. The unbound copy of the Bid Form is to be completed and submitted with the Bid security along with the documents listed below. The bidder shall submit one original of all documents in the envelope.

- A. Statement of Bidders Qualifications
- B. Affidavit of No Collusion by Prime Bidder
- C. Drug-Free Workplace Affidavit
- D. Attestation Regarding Personnel Used in Contract Performance
- E. Certification By Proposed Prime or Subcontractor Regarding Equal Employment Opportunity
- F. Certification Regarding Debarment, Suspension and Other Responsibility Matters
- G. Iran Divestment Act Compliance Certification

- 15.02 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Advertisement for Bids and shall be enclosed in a sealed envelope with the "Contractor's Identification" form securely attached thereto and shall contain the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to the place indicated in the Advertisement for Bids.

- 15.03 The Bidder shall comply with Tennessee Code Annotated (TCA) Chapter 6 of Title 62, hereby incorporated by reference. Except for bids in an amount less than twenty five thousand dollars, the Bidder shall provide the name, license number, expiration date thereof, and license classification of the contractors applying to the bid for the prime contract and for the masonry contract where the total cost of the masonry portion of the construction project exceeds one hundred thousand dollars, materials and labor, electrical, plumbing, heating, ventilation and air conditioning contracts on the outside of the envelope containing the Bid. Only one contractor in such classification may be listed.

Prime contractor bidders who are to perform the masonry portion of the construction project which exceeds one hundred thousand dollars, materials and labor, the electrical, plumbing, heating, ventilation and air conditioning shall be so designated upon the outside of the envelope. When the bid is less than twenty five thousand dollars, the name of the contractor only shall appear on the outside of the envelope containing the bid. Failure of any bidder to comply therewith shall void such bid and such bid shall not be considered.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A Bid may be modified or withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.
- 16.02 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.
- 16.03 A bid may be withdrawn after the time period stated in the Advertisement for Bids after the date of the opening of the bids, provided that the Bidder has not been notified within said time period that his bid has been accepted.

ARTICLE 17 – OPENING OF BIDS

- 17.01 Bids will be opened at the time and place indicated in the Advertisement or Invitation to Bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.
- 17.02 The officer whose duty is to open them will decide when the specified time has arrived, and no bids received thereafter will be considered. No responsibility will be attached to any officer for the premature opening of a bid not properly addressed and identified. Bidders or their authorized agents are invited to be present.
- 17.03 Filing of Proposal
- A. No proposals will be considered by the City unless they are filed in sealed envelopes with the City within the time limit for receiving proposals as stated in the advertisement and shall be made on proposal forms attached to Specifications, together with the Contract Documents, Bid Bond, and Statement of Compliance with General Contractors Licensing Law and other required miscellaneous forms, all of which are to be sealed in an envelope addressed to the City of Chattanooga, Tennessee, with the completed "Contractor's Identification" form securely attached thereto.
 - B. Each proposal must contain the full name and address of each person, firm or corporation interested therein. In case of a partnership, the name and address of each partner must be stated. The firm, corporation or individual name of the bidder must be signed in the space provided for the signature on the proposal blank. In case of a corporation, the title of the officer signing must be stated, and the person signing shall

also state under the laws of what State the corporation was chartered and the names and titles of the officers having authority, under the by-laws, to sign contracts. The proposal shall also be attested by its Secretary. In case of a partnership or firm, the signature of at least one of the partners must follow the firm name.

- 17.04 Opening of Proposals. The proposals filed with the City will be opened at the time stated in the advertisement. Bidders are invited to attend the meeting at the time set for opening of proposals, at which time they should make any protests as to procedure followed in inviting bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 18.01 All Bids will remain subject to acceptance for the period of time stated in the Advertisement for Bids, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder. Nothing herein shall be deemed to limit the discretion of the City to determine whether or not a bidder not hereby disqualified is the lowest responsible bidder.
- 19.02 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 19.03 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 19.04 A bid may be declared by the Owner to be non-responsive for, but not limited to, any of the following reasons:
- A. Bid contains blanks, Proposal is not complete or required accompanying documents, certifications, and statements are not included.
 - B. Bid contains modifications or alterations of the Bid Form or other Contract Documents.
 - C. Bid is a qualified or conditional bid.
 - D. Bid contains unrealistic data, erroneous data, inaccurate data, or data that cannot be documented or substantiated.

- 19.05 Bidders debarred or suspended under Chattanooga City Code, Part II, Chapter 2, Article XX (Ordinance No. 8259), or who are debarred or suspended by operation of any other applicable state or federal law or regulation, are not eligible to be contractors or subcontractors to this contract.
- 19.06 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.
- 19.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work in accordance with the Contract Documents.
- 19.08 All Bidders are required to execute a notarized Affidavit of No Collusion by Prime Bidder, and a Bidder who fails to do so will be disqualified.
- 19.09 The Contracts will be awarded to the responsive, responsible Bidders submitting the lowest Bid complying with the conditions of the Contract Documents. Award will be made on the basis of the prices given in the Bid, including or not including alternates, at the discretion of the Owner.
- 19.10 Conditions Precedent to Award of Contracts. The following stipulations shall all and severally be conditions precedent to the award by the City of Chattanooga of all contracts for construction, to-wit:
- A. No member of the City Council nor any officer, director or other person whose duty it is to vote for, let out, overlook or in any manner superintend this contract and who is related to said member within the third degree by either consanguinity or affinity, nor any other official who may be directly interested in this contract or work of any kind whatsoever under its direction. "Directly interested" means any contract with the official himself or with any business in which the official is the sole proprietor, a partner, or the person having the controlling interest. "Controlling interest" shall include the individual with the ownership or control of the largest number of outstanding shares owned by any single individual or corporation.
 - B. It shall not be lawful for any officer, director, or other person whose duty it is to vote for, let out, overlook, or in any manner to superintend any work or any contract in which the City shall or may be interested, to be indirectly interested in any such contract unless the officer publicly acknowledges his interest and rescues himself from any of his duties which include the consideration of, voting on, letting out, overseeing, or superintending the work or contract giving rise to the conflict. "Indirectly interested" means any contract in which the officer is interested but not directly so, but includes contracts where the officer is directly interested but is the sole supplier of goods or services in a municipality or county. (See T.C.A. Section 12-4-101, et seq.)
 - C. The essence of all the contracts shall be excellence of quality, integrity and durability of the completed product as specified; and the contractor hereunder shall be held responsible therefor.

- D. The contractor shall maintain and guarantee the integrity of the completed work for a full period of one year after the completion as set forth more fully in Section 4 of these General Provisions.
- E. The decisions of the Engineer, as to quality, integrity and durability of the work shall be final and conclusive as to all parties to said contract, whether it be directly by and between the contractor and said City or by and between him and another party; and said Engineer shall have full authority to condemn by written notice to contractor, or his agent or foreman on job, and shall order the removal, reconstruction and restoration of all work that in his opinion, is in any respect inferior, defective or faulty, or that shows signs of disintegration and failure, at any time before final estimate is issued and payment made therefor, or within a period of one year after the completion and acceptance thereof in writing by the City.
- F. Contractor shall remove, reconstruct and restore all such condemned work in full conformance with the specifications, and in complete compliance with the requirements of the official notice, in writing, of said Engineer relating thereto, and within the period of time designated in the notice.
- G. Should the contractor neglect, refuse, or fail to remove, reconstruct and restore all of the defective work so condemned and rejected, within the period of time, as required by said official notice, then and in event of such failure on contractor's part, whether said work was executed by contract directly with the City or by private contract directly with other parties, the City of Chattanooga will look to and require, respectively, the surety on the Performance Bond, executed by the contractor under contract directly with said City, to make good and have all such defective and condemned work removed, reconstructed and restored in complete compliance with the requirements of the official notice of said Engineer to that effect; and likewise, in the event that such work was done under private contract, as aforesaid, the City of Chattanooga will look to and require the surety on the Performance Bond executed by said contractor to make good and have all such defective and condemned work removed, reconstructed and restored in complete compliance with the requirements of the official notice of said Engineer to that effect, in each instance as the case may be.
- H. The unit price bid by the contractor for any and all work and the compensation to be paid therefore shall cover and include the cost of all materials, forms, supports, labor, work and things necessary for a complete workmanlike job, and shall also include the cost of all services, duties and obligations of said contractor and of the corresponding surety on the Performance Bond collateral therewith as stipulated in subsections above set out, to the satisfaction and approval of the Engineer.

19.11 Award of Contract.

- A. The City acting by and through the City Council will either award the contract or reject all proposals received thereon after the formal opening of proposals and evaluation of the bids.
- B. The award of the contract, if it is awarded, will be to the lowest responsible bidder whose proposal complies with the requirements of the City.

- C. Projects will be awarded only to responsible bidders, and an award will not be made in any case, until all necessary investigations have been made into the responsibility of the low bidder.
- D. If the project is funded in part by a state or federal grant, then the award may be subject to the concurrence of the granting contract agency.

ARTICLE 20 – CONTRACT SECURITY AND INSURANCE

20.01 Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by such bonds.

ARTICLE 21 – SIGNING OF AGREEMENT

21.01 When Owner issues a Notice of Award to the Successful Bidder, Owner shall notify the Successful Bidder that the required number of unsigned counterparts of the Agreement along with the other Contract Documents will be available to be picked up, which are identified in the Agreement as attached thereto. Within ten days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

21.02 Upon failure of the bidder to execute the required bonds or to sign the required contract within ten days after the contract is awarded, he will be considered to have abandoned his proposal and the City may annul the award. By reason of the uncertainty of market prices of materials and labor, and it being impracticable and extremely difficult to fix the amount of damages to which the City would be put by reason of said bidder's failure to execute said bonds and contract within ten days, the proposal guaranty accompanying the proposal shall be the agreed amount of damages which the City will suffer by reason of such failure on the part of the bidder and shall thereupon immediately be forfeited to the City. The filing of a proposal will be considered as an acceptance of this provision.

ARTICLE 22 – DELETED

ARTICLE 23 – RETAINAGE

23.01 Provisions concerning Contractor's rights to deposit securities in lieu of retainage are set forth in the Agreement.

ARTICLE 24 – DELETED

ARTICLE 25 – DELETED

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American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400
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Request for Bidder Information

Questions regarding the project or the Bid Documents must be in writing as required by the Instruction to Bidders. Questions must be written on this form and sent by email, fax or mail to the address listed below. Upon timely receipt, if appropriate, an Addendum will then be issued to all persons who have received Bid Documents from the Owner.

City of Chattanooga
Purchasing Department
101 E. 11th Street, Suite G13
Chattanooga, TN 37402
purchasing@chattanooga.gov
Phone Number: (423) 643-7230
Fax Number: (423) 643-7244

Contract: **RIVERVIEW PARK/CGCC CHRONIC OVERFLOW ELIMINATION PROJECT**

Contract Number: **W-19-015-201**

From: _____

Company: _____

Date: _____

CLARIFICATION IS NEEDED FOR THE FOLLOWING ITEMS:
(List Specification Section, Paragraph, Drawing Number and/or Detail Number)

END OF DOCUMENT

**RIVERVIEW PARK/CGCC CHRONIC SS0 ELIMINATION PROJECT
CONTRACT NUMBER W-19-015-201**

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

City of Chattanooga, Tennessee
Purchasing Department
101 E. 11th Street, Suite G13
Chattanooga, Tennessee 37402

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for period of time after the Bid opening as stated in the Advertisement for Bids, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged.

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in SC-4.02 as containing reliable "technical data," and (2)

reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in SC-4.06 as containing reliable "technical data."

- E. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.
- F. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
- J. Where this Bid Form contains the provision for a bid based on a lump sum price, the Bidder shall be responsible for having prepared its own estimate of the quantities necessary for the satisfactory completion of the Work specified in these Contract Documents and for having based the lump sum price bid on its estimate of quantities.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;
2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Item No.	Description	Estimated Qty.	Unit	Unit Price	Total Price
1.	MOBILIZATION/DEMOBILIZATION				
a.	MOBILIZATION	1	LS	\$	\$
b.	DEMOBILIZATION	1	LS	\$	\$
2.	Erosion Prevention and Sedimentation Control				
a.	Silt Fence	5,000	LF	\$	\$
b.	Straw Bales	100	EA	\$	\$
c.	Construction Entrance (trackout control system)	1	EA	\$	\$
d.	Erosion Control Wattle	250	LF	\$	\$
e.	Inlet Protection	2	EA	\$	\$
f.	4-ft High Orange, Plastic Construction Barrier Fence	2,000	LF	\$	\$
g.	Maintenance of EPSC	1	LS	\$	\$
3.	Same Trench Sewer Replacement, Remove Existing 15-inch Diameter Sewer and Replace with 24-inch Diameter PVC Pipe Sewer				
a.	0 – 6 Feet Deep	414	LF	\$	\$
b.	6 – 8 Feet Deep	354	LF	\$	\$

Item No.	Description	Estimated Qty.	Unit	Unit Price	Total Price
c.	8 – 10 Feet Deep	936	LF	\$	\$
d.	10 – 12 Feet Deep	85	LF	\$	\$
e.	Drainage Way Crossing 24-inch Diameter Sewer and 36-inch Steel Casing Pipe with Casing Spacers and End Seals, 0 – 6 Feet Deep (includes restoration of concrete channel)	25	LF	\$	\$
f.	Rock Removal & Disposal (for open cut replacement)	100	CY	\$	\$
g.	Unsuitable Soil Removal and Disposal at subgrade (as directed by Owner)	600	CY	\$	\$
h.	TDOT No. 57 Stone for replacement of unsuitable soil (as directed by Owner)	1,200	TONS	\$	\$
4.	Connections				
a.	Connect to Existing 8-Inch PVC Sewer Line	2	EA	\$	\$
b.	Connect to Existing 8-Inch Clay Sewer Line	1	EA	\$	\$
c.	Connect to Existing 15-Inch PVC Sewer Line	1	EA	\$	\$
5.	Sewer Replacement by Pipe Bursting				
a.	Machine Pit (all-inclusive including site restoration)	1	LS	\$	\$
b.	Launch Pit (all-inclusive including site restoration)	1	LS	\$	\$
c.	Upsize Existing 15-Inch Gravity Sewer with 28-Inch (OD) HDPE DR 17 Pipe Sewer	748	LF	\$	\$
d.	Connect Proposed 28-inch HDPE to existing MH S136I018, Sta. 0+00	1	EA	\$	\$
6.	Sewer CCTV Inspection				
a.	Pre-Installation: 15-Inch Sewer	2,562	LF	\$	\$
b.	Post-Installation: 24-Inch Sewer	2,562	LF	\$	\$
7.	Manholes - Subsurface Rehabilitation, Type 2 Polymer Resin-based lining (Spec. 33 01 30.83)				
a.	MH S136I018	24	VF	\$	\$
b.	MH S136I001	18	VF	\$	\$
c.	MH S136J025	16	VF	\$	\$
d.	MH S136I019	23	VF	\$	\$
e.	Rebuild Bench and Invert in Existing Manholes (MH S136I018 and MH S136I001)	2	EA	\$	\$

Item No.	Description	Estimated Qty.	Unit	Unit Price	Total Price
8.	New Precast Concrete Manhole, 5-Foot Diameter				
a.	6 – 8 Feet Deep	3	EA	\$	\$
b.	8 – 10 Feet Deep	5	EA	\$	\$
c.	Watertight Frame and Cover	9	EA	\$	\$
d.	Manhole Vent Assembly	1	EA	\$	\$
e.	Flowable Fill – abandoned sewer line	100	CY	\$	\$
f.	Abandon Existing Manhole	1	EA	\$	\$
9.	Drop Manhole, 5-Foot Diameter				
a.	10 – 12 Feet Deep (MH S136A163)	1	EA	\$	\$
10.	Sewer Flow Control				
a.	42-inch Sewer – Setup MH S136J025	1	LS	\$	\$
b.	15-inch Sewer – Setup No. 1, MH S136G025	1	LS	\$	\$
c.	15-inch Sewer – Setup No. 2, MH S136H103	1	LS	\$	\$
d.	Sewer Flow from 8-inch private sewer lines into MH S136I001	1	LS	\$	\$
e.	Sewer Flow from MH S136H121 into MH S136H111	1	LS	\$	\$
f.	Sewer Flow from MH S136A129 into MH S136A163	1	LS	\$	\$
11.	Pavement Removal and Replacement				
a.	Asphalt, CGCC Access Road	1,300	SY	\$	\$
b.	Asphalt, Heritage Landing Parking Lot	800	SY	\$	\$
c.	Concrete Restoration	50	SY	\$	\$
12.	Site Restoration				
a.	Sod (as directed by Owner)	1,000	SY	\$	\$
b.	Seeding	4,000	SY	\$	\$
13.	Cash Allowances				
a.	Soil, Concrete and Materials Testing		Allowance		\$ 10,000.00
b.	Construction Verification Surveying		Allowance		\$ 15,000.00
c.	Landscaping (shrubs, trees, buffer restoration, etc. as directed by Owner)		Allowance		\$ 10,000.00

Item No.	Description	Estimated Qty.	Unit	Unit Price	Total Price
d.	CGCC Site Restoration		Allowance		\$ 200,000.00

BID TOTAL, ITEMS 1 THROUGH 13, INCLUSIVE, THE AMOUNT OF _____

_____ DOLLARS (\$_____).

Unit Prices have been computed in accordance with Paragraph 11.03.B of the General Conditions.

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

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

- A. Statement of Bidders Qualifications
- B. Affidavit of No Collusion by Prime Bidder
- C. Drug-Free Workplace Affidavit
- D. Iran Divestment Act Compliance Certification

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

9.01 This Bid submitted by:

An Individual

Name (typed or printed): _____

By: _____ (SEAL)

(Individual's signature)

Doing business as: _____

Attest: _____

(Notary)

Name (typed or printed): _____

A Partnership

Partnership Name: _____ (SEAL)

By: _____

(Signature of general partner – attach evidence of authority to sign)

Name (typed or printed): _____

Attest: _____

(Signature of another Partner)

Name (typed or printed): _____

A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____

(Signature)

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest: _____

(Signature of Corporate Secretary)

Name (typed or printed): _____

Date of Qualification to do business in Tennessee is _____

A Joint Venture

Name of Joint Venturer: _____

First Joint Venturer Name: _____ (SEAL)

By: _____

(Signature of first joint venture partner)

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of second joint venture partner)

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

All Bidders shall complete the following:

Bidder's Business address: _____

Phone: _____ Facsimile: _____

Primary Contact: _____

E-mail: _____

Submitted on _____, 202__.

State Contractor License No. _____.

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BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER *(Name and Address)*:

SURETY *(Name and Address of Principal Place of Business)*:

OWNER *(Name and Address)*:

City of Chattanooga, Tennessee
101 East 11th Street
Chattanooga, Tennessee 37402

BID

Bid Due Date:
Description *(Project Name)*: Riverview Park/CGCC Chronic SSO Elimination Project
Contract # W-19-015-201

BOND

Bond Number:
Date *(Not earlier than Bid due date)*:
Penal sum _____ \$ _____
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER

SURETY

Bidder's Name and Corporate Seal (Seal) Surety's Name and Corporate Seal (Seal)

By: _____
Signature

By: _____
Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by Owner, or
 - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

Statement of Bidder's Qualifications

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information desired. Attach all additional sheets to this statement. (Sample "Project Information Form" contained at the end of this Section.)

1. Name of Bidder: _____

2. Permanent main office address and phone number: _____

3. When organized: _____

4. If a Corporation, where incorporated: _____

5. How many years have you been engaged in the contracting business under your present firm or trade name? _____

6. Contracts on hand. (Complete a "Project Information Form", for each Contract on hand.)

7. General description of type of work performed by your company: _____

8. Have you ever failed to complete any work awarded to you? If so, where and why? _____

9. Have you ever defaulted on a contract? If so, where and why? _____

10. Attach a list of the most important projects recently completed by your company which are similar in scope to this Project. (Complete a "Project Information Form", for each Project listed.)

11. Names, background and experience of the principal members of your organization, including officers:

Name	Position	Years Experience
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Statement of Bidder's Qualifications

12. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Statement of Bidder's Qualifications.

I, _____, certify that I am _____ of the Bidder, and that the answers to the foregoing questions and statements contained therein are true and correct.

BIDDER: _____

By: _____
(name signed)

(name printed or typed)

Title: _____

Date: _____

Subscribed and sworn to me this ___ day of _____, 20__.

NOTARY PUBLIC: _____
(name signed)

(name printed or typed)

Commission Expires: _____
(Date)

(SEAL)

Project Information Form

Project Title: _____

Project Description: _____

Major Subcontractors: _____

Major Suppliers: _____

Project Owner:

- Owner Name: _____
- Contact Person: _____
- Phone Number: _____

Engineer/Construction Manager:

- Company Name: _____
- Contact Person: _____
- Phone Number: _____

Contract Amount:

- Initial: _____
- Final: _____

Contract Time

- Initial: _____
- Final: _____
- Completion Date: _____

END OF SECTION

Affidavit of No Collusion By Prime Bidder

CONTRACT NUMBER W-19-015-201
FOR THE CITY OF CHATTANOOGA

STATE OF _____

COUNTY OF _____

The undersigned, _____, having been duly sworn, deposes and states as follows:

1. I am the _____ of _____
(sole owner, a partner, president, secretary, etc.) (Name of Corporation/Partnership/Limited Partnership/Joint Venture)

which is a _____ in good standing,
(Corporation) (Proprietorship) (Partnership) (Limited Partnership) (Joint Venture)

formed under the laws of _____, hereinafter referred to as "Bidder."
(State of incorporation or formation)

2. I am authorized to make this affidavit on behalf of said Bidder, and I have personal knowledge of the matters set forth herein.

3. On _____, 202__, said bidder is submitting a bid to the City of Chattanooga for the above captioned contract. This bid was prepared under my personal supervision and direction. During the preparation of the bid, I have taken affirmative steps to inquire about the circumstances of the bid preparation in general and about any contacts between or among this bidder and any other bidders or prospective bidders in particular.

4. I am aware of the Federal and State laws including without limitation, the Sherman Act (15 U.S.C. 1) and the Tennessee antitrust laws (T.C.A. 47-25-101, et seq.), which make it illegal to agree to fix or rig bids or otherwise agree to restrain competition in bidding for contracts with the City of Chattanooga. I am aware in particular that violations of the Sherman Act are federal crimes punishable by a fine of up to \$1.0 million for a corporation, and a fine of up to \$100,000 for an individual or by imprisonment not exceeding three years, or both.

5. I hereby certify and attest that the bid identified in paragraph 3 is based solely upon the independent knowledge, expertise and business judgment of the bidder acting through its officers and agents and is not the product of, nor was it prepared in connection with, any contract, combination, conspiracy, understanding or collusion between or among any other bidder or prospective bidder on said contract.

Signature

Subscribed and sworn to me this ___ day of _____, 20__.

NOTARY PUBLIC: _____

(name signed)

(name printed or typed)

Commission Expires: _____

(Date)

(SEAL)

**Affirmative Action Plan
For
City of Chattanooga W-19-015-201**

(Name of Contractor)

The above named Contractor is an equal opportunity employer and during the performance of this contract, the Contractor agrees to abide by the Affirmative Action Plan of the City of Chattanooga as follows:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, or handicap. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, national origin, or handicap. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay, or other forms of compensation, and selection of training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
2. The Contractor will, 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, religion, sex, or national origin, or handicap.
3. The Contractor will send to each labor union or representative of workers with which he/she has a collective bargaining agreement or other contract or understanding, a notice advising the said labor union or works' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
4. The DBE goal for this project has been set at 0%.
5. This Plan or any attachments thereto shall further provide a list of all employees annotated by job function, race, and sex who are expected to be utilized on this project.
6. During the term of this contract the following non-discriminatory hiring practices shall be employed to provide employment opportunities for minorities and women:
 - a. All help wanted ads placed in newspapers or other publications shall contain the phrase "Equal Employment Opportunity Employer".
 - b. Maintain systematic contracts with minority groups and human relations organizations.
 - c. Encourage present employees to refer qualified minority group and female applicants for employment opportunities.

Iran Divestment Act Compliance Certification

In accordance with Tennessee Code Annotated (TCA) § 12-12-101 *et. seq.*, by submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each bidder is not on the list created pursuant to TCA § 12-12-106.

SIGNATURE: _____

NAME PRINTED: _____

COMPANY: _____

DATE: _____

Drug Free Workplace Affidavit of Prime Bidder

STATE OF _____

COUNTY OF _____

Comes the affiant after having first been duly sworn and testifies as follows:

1. My name is _____ I hold the principal office of _____ for _____.
(Name of Principal Office) (Name of Bidding Entity)

2. _____ has submitted a bid to the _____
(Name of Bidding Entity)
City of Chattanooga for the construction of
Contract W-19-015-201
Riverview Park/CGCC Chronic SSO Elimination Project

3. _____ employs more than five (5) employees.
(Name of Bidding Entity)

4. In accordance with Tenn. Code Ann. §50-9-113, this is to certify that _____ has in effect at the time of its submission of
(Name of Bidding Entity)
a bid to perform the construction of the City of Chattanooga project identified above, a drug-free workplace program that complies with Title 50, Chapter 9 of the Tennessee Code.

5. This affidavit is made on personal knowledge.

Signature

Subscribed and sworn to me this ___ day of _____, 20___.

NOTARY PUBLIC: _____
(name signed)

(name printed or typed)

Commission Expires: _____
(Date)

(SEAL)

Attestation Regarding Personnel Used in Contract Performance

Project Name: Riverview Park/CGCC Chronic SSO Elimination Project

The Bidder/Contractor, identified below, does hereby attest, certify, warrant, and assure that the Contractor shall not knowingly utilize the services of an illegal immigrant in the performance of this Contract and shall not knowingly utilize the services of any subcontractor who will utilize the services of an illegal immigrant in the performance of this Contract.

BIDDER/CONTRACTOR: _____

By: _____

(name signed)

(name printed or typed)

Title: _____

Date: _____

NOTICE: This attestation MUST be signed by an individual empowered to contractually bind the Contractor. If said individual is not the chief executive or president, this document shall attach evidence showing the individual's authority to contractually bind the Contractor.

END OF SECTION

Contractor's Identification

(ALL BLANKS MUST BE FILLED. USE N/A AS NECESSARY)

This form shall be attached to the sealed envelope containing the Bid. All prime contractors and contractors for electrical, plumbing, and heating, ventilation, and air conditioning contracts for bids of \$25,000 or more and/or masonry items for \$100,000 or more are required to complete this form pursuant to TCA-62-6-119. Failure to provide all of this information on the sealed envelope shall be considered a non-responsive Bid and shall not be opened or shall automatically disqualify such bid.

BIDDER:

Complete the following for all applicable Electrical, Plumbing, Masonry and Heating, Ventilation and Air Conditioning Subcontractors: Prime Contractor must fill in space below when performing Electrical, Plumbing, or Heating, Ventilation and Air Conditioning Sub-Contractor work for any bids of \$25,000 or more; and for Masonry for any bids of \$100,000 or more:

Name: _____

Address: _____

If TaxID Number (TIN) issued, list below. Otherwise, list Owner's Social Security Number (SSN).

TaxID Number: _____

Tennessee License No.: _____

License Registration Date: _____

License Expiration Date: _____

Monetary Limit: _____

_____ (\$ _____)

Classification: _____

Subcontractor: _____

Tennessee License No.: _____

License Expiration Date: _____

License Classification: _____

Monetary Limit: _____

_____ (\$ _____)

Subcontractor: _____

Tennessee License No.: _____

License Expiration Date: _____

License Classification: _____

Monetary Limit: _____

_____ (\$ _____)

Subcontractor: _____

Tennessee License No.: _____

License Expiration Date: _____

License Classification: _____

Monetary Limit: _____

_____ (\$ _____)

CITY OF CHATTANOOGA
Purchasing Department
101 E. 11th Street, Suite G13
Chattanooga, Tennessee 37402

LOCATION: City Hall, Purchasing Department
101 E. 11th Street
Suite G13
Chattanooga, Tennessee 37402

SEALED BID PROPOSAL FOR:
Riverview Park/CGCC Chronic SSO Elimination Project
Contract Number: W-19-015-201

DATE OF BID OPENING: Day, Date
TIME: 2:00 p.m.

THIS AGREEMENT is by and between City of Chattanooga, Tennessee (“Owner”) and _____ (“Contractor”)

Owner and Contractor agree as follows:

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Riverview Park/CGCC Chronic SSO Elimination Project
Contract # W-19-015-201

ARTICLE 2 – THE PROJECT

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

Riverview Park/CGCC Chronic SSO Elimination Project

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by Fulghum, MacIndoe & Associates, Inc., (Engineer), which is to act as Owner’s representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Days to Achieve Substantial Completion and Final Payment*

A. Work from Station 0+00 through Station 13+29.41 (MH S136G027) shall be completed within 110 days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions.

B. All Work will be substantially completed within 240 days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within 270 days after the date when the Contract Times commence to run.

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner \$1,000.00 for each day that expires after the time specified in Paragraph 4.02 a. above until the work is complete.
- B. For all remaining work, Contractor shall pay Owner \$500.00 for each day that expires after the time specified in Paragraph 4.02 b. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner \$500.00 for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A below:

- A. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 25th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.
 - 1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions.

- a. 95 percent of Work completed (with the balance being retainage); and
- b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

ARTICLE 7 – INTEREST

- 7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate of one half percent per annum.

ARTICLE 8 – CONTRACTOR’S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:
- A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
 - B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in Paragraph SC-4.02 of the Supplementary Conditions as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph SC-4.06 of the Supplementary Conditions as containing reliable "technical data."
 - E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor’s safety precautions and programs.
 - F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that further examinations, investigations, explorations,

- tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
 - H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
 - I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 Contents

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 1 to 7, inclusive).
 - 2. Performance bond (pages 1 to 2, inclusive).
 - 3. Payment bond (pages 1 to 3, inclusive).
 - 4. General Conditions (pages 1 to 91, inclusive).
 - 5. Supplementary Conditions (pages 1 to 7, inclusive).
 - 6. Specifications as listed in the table of contents of the Project Manual.
 - 7. Drawings as listed on the Cover Sheet, with each sheet bearing the following general title: **Riverview Park/CGCC Chronic SSO Elimination Project**.
 - 8. Addenda (numbers _____ to _____, inclusive), incorporated herein.
 - 9. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages _____ to _____, inclusive).
 - 10. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

- C. There are no Contract Documents other than those listed above in this Article 9.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 Terms

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 Assignment of Contract

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 Successors and Assigns

- A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 Severability

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 Contractor's Certifications

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of

Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on ____ day of _____, 20 ____, (which is the Effective Date of the Agreement).

OWNER:

CONTRACTOR

City of Chattanooga, Tennessee

By: _____

By: _____

Title: Public Works Administrator

Title: _____

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____

Attest: _____

Title: City Finance Officer

Title: _____

Address for giving notices:

Address for giving notices:

City Hall

101 East 11th Street

Chattanooga, Tennessee 37402

CITY FINANCE OFFICER'S CERTIFICATE

I do hereby certify that the funds required to be paid by the City under this contract have been appropriated or a loan authorized and have been encumbered and will be available as needed for payment.

This _____ day of _____, 20 ____.

City Finance Officer

CITY ATTORNEY'S APPROVAL

This contract approved as to form and legality this the ___ day of _____, 20 ____.

City Attorney

This document was prepared in part from material (EJCDC C-520 Suggested Form of Agreement Between Owner and Contractor for Construction Contract (Stipulated Price)) which is copyrighted as indicated below:

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1420 King Street, Alexandria, VA 22314-2794
(703) 684-2882
www.nspe.org

American Council of Engineering Companies
1015 15th Street N.W., Washington, DC 20005
(202) 347-7474
www.acec.org

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400
(800) 548-2723
www.asce.org

Associated General Contractors of America
2300 Wilson Boulevard, Suite 400, Arlington, VA 22201-3308
(703) 548-3118
www.agc.org

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CONTRACTOR (name and address):

SURETY (name and address of principal place of business):

OWNER (name and address):

City of Chattanooga, Tennessee
101 East 11th Street
Chattanooga, Tennessee 37402

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (name and location): Riverview Park/CGCC Chronic SSO Elimination Project
Contract # W-19-015-201

BOND

Bond Number:

Date (not earlier than the Effective Date of the Agreement of the Construction Contract):

Amount:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (attach power of attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after Owner terminates for cause in accordance with General Conditions Paragraph 15.02.

4. Failure on the part of the Owner to comply with the notice requirement in General Conditions Paragraph 15.02 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take the following action:

5.1 Waive its right to perform and complete, to arrange for completion, or to obtain a new contractor, and with reasonable promptness under the circumstances:

5.1.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.1.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

6.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

6.2 additional legal, design professional, and delay costs resulting from the Contractor's Default; and

6.3 liquidated damages caused by delayed performance or non-performance of the Contractor.

7. The Surety's liability is limited to the amount of this Bond.

8. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

9. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

10. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

11. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

12. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

13. Definitions

13.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

13.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

13.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

13.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

13.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

This document was prepared in part from material (EJCDC C-610 Performance Bond) which is copyrighted as indicated below:

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1420 King Street, Alexandria, VA 22314-2794
(703) 684-2882
www.nspe.org

American Council of Engineering Companies
1015 15th Street N.W., Washington, DC 20005
(202) 347-7474
www.acec.org

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400
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CONTRACTOR (name and address):

SURETY (name and address of principal place of business):

OWNER (name and address): City of Chattanooga, Tennessee
101 East 11th Street
Chattanooga, Tennessee 37402

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (name and location): Riverview Park/CGCC Chronic SSO Elimination Project
Contract # W-19-015-201

BOND

Bond Number:

Date (not earlier than the Effective Date of the Agreement of the Construction Contract):

Amount:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal (seal)

Surety's Name and Corporate Seal (seal)

By: _____
Signature

By: _____
Signature (attach power of attorney)

Print Name

Print Name

Title

Title

Attest: _____
Signature

Attest: _____
Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
 - 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2 Pay or arrange for payment of any undisputed amounts.
 - 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. **Definitions**
 - 16.1 **Claim:** A written statement by the Claimant including at a minimum:
 1. The name of the Claimant;
 2. The name of the person for whom the labor was done, or materials or equipment furnished;
 3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
 4. A brief description of the labor, materials, or equipment furnished;
 5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 - 16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
 - 16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
 - 16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
 - 16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

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Progress Payment Request

PAY ESTIMATE NUMBER: _____ PERIOD: FROM _____ TO _____
CONTRACT NUMBER: _____ RESOLUTION NUMBER: _____

PROJECT NAME: _____

SUBMITTED BY: _____

According to the best of our knowledge and belief, we certify that all items and amounts shown on the face of this periodic estimate for partial payment are correct, that all work has been performed and/or materials supplied in full accordance with the requirements of the referenced contract, and/or duly authorized deviations, substitutions, alterations, and/or additions that the foregoing is a true and correct statement of the contract account up to and including the last day of the period covered by this periodic estimate and that no part of the Balance Due this payment has been received.

As per contract specification requirements we understand and agree that the approval of this progress payment shall not be construed as acceptance of any work, material, or products and shall not relieve us in any way from our responsibilities and obligations under this contract, including but not limited to, a final reconciliation of quantities and related costs.

NET AMOUNT DUE: _____

CONTRACTOR: _____
NAME PRINTED: _____
SIGNATURE: _____
TITLE: _____
DATE: _____

APPROVALS

I certify that the above process payment request appears to be accurate and is in general compliance with the amount of work completed during progress payment period.

REVIEWED BY

Table with 4 columns and 5 rows. Headers: NAME PRINTED, SIGNATURE, DATE, COMPANY, TITLE. Content includes Fulghum, MacIndoe & Associates, Inc. and Jacobs Engineering Group, Inc.

APPROVED FOR PAYMENT

By: _____ DATE: _____
DIRECTOR OF WASTE RESOURCES DIVISION

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by



AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents. After issuance, any addenda shall become a part of the specifications, as much as though fully contained therein.

1.1 Administrator-The Administrator, Director or Department Head of the Department of the City of Chattanooga under whose general administration and observation this contract is being performed.

2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

4.1 Award-The formal acceptance of the proposal of the lowest responsible bidder by the City Council, subject to the execution and approval of a satisfactory contract and the required bonds therefor, and following such other conditions as may be specified or otherwise required by law or the purchasing requirements of the City of Chattanooga.

5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*—The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.

8.1 Bonds-Bid, Performance and Payment Bonds and other instruments of security to be furnished by the Contractor in accordance with the Contract Documents.

9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement. The document to be executed shall be a Change Request Form (CRF) as included in these Contract Documents.

9.1 City-The City of Chattanooga, Tennessee.

9.2 City Attorney-The person duly authorized by the City to act in the capacity of City Attorney, his authorized designee, or special counsel to the City, acting severally within the scope of the particular duties entrusted to them.

10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral. Whenever, in any portion of the Contract Documents, a requirement of the Contract is stated, it shall be interpreted to mean a requirement of the Contract Documents as defined herein, unless the context indicates the more restricted definition of that portion of the Contract Documents which is captioned "Contract".

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents. Whenever, in any portion of the Contract Documents, the terms "plans and specifications" or "specifications" or "contract" or words of like import appear, they shall be interpreted to mean "Contract Documents" as defined herein unless the context indicates that a more restrictive designation of a particular portion of the Contract Documents is intended.

13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*—The individual or entity whose proposal is accepted by the Owner with whom Owner has entered into the Agreement; for performance of the work covered by and in conformance with these Contract Documents.

16. *Cost of the Work*—See Paragraph 11.01 for definition.

16.1 Designer - The individual or entity named as such in the Agreement, if a different person or entity from Engineer.

17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined. The term Drawings shall be considered synonymous with the term Plans.

18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*—~~The individual or entity named as such in the Agreement.~~The City Engineer (or when retained by the City, an architect or engineer, with such entity being named in the Agreement) and his duly authorized assistants, observers, inspectors or administrators acting severally within the scope of the particular duties entrusted to them

20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*—Sections of Division 01 of the Specifications. The General Requirements are applicable to all Sections of the Specifications and to the entire Work.

22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.

23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

23.1 Inspector-An authorized representative of the Engineer assigned to make necessary observations of the work performed by the Contractor.

24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

25.1 Liquidated Damages - amounts shall be as stipulated elsewhere in the Contract Documents. Liquidated damages shall apply to the Contract Times for the Project. Liquidated Damages shall be both additive and cumulative. Liquidated Damages shall end upon Substantial Completion, Completion of the Work associated with each Milestone Date, and upon final completion of the Work. Liquidated damages are not a penalty, but constitute liquidated damages for loss to the City because of increases in expenses for administration, legal counsel, accounting, engineering, construction supervision, inspection, and any other

expenses incurred directly as a result of the delay of the Contractor in completing the work. This provision for liquidated damages shall be effective between the parties ipso facto without necessity for demand or putting in default by any notice or other means than by the terms of these Contract Documents, the Contractor hereby waiving any such other notice of default and acknowledging that the Contractor shall be deemed to be in default by the mere act of his failure to complete the work within the Contract Time, or within any valid extension of such time hereunder.

26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—~~The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed. The City of Chattanooga, Tennessee.~~ The Owner may designate an authorized representative to exercise the authority, in whole or in part, identified in these contract Documents, with such designation being identified in the Supplementary Conditions.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
31.1 Plan or Plans—All of the drawings pertaining to the contract showing the scope and characteristics of the work or a part thereof, including such supplementary drawings as the Engineer may issue in order to elucidate other drawings or for the purpose of showing the changes in the work or for showing details not shown thereon. The term Plans shall be considered synonymous with the term Drawings.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in ~~the~~ its table(s) of contents.

35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
40. *Shop Drawings*—All drawings, diagrams, illustrations, brochures, schedules, specified design related submittals, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work will be fabricated or installed. Shop drawings may also mean detail drawings, working drawings, construction drawings, and engineering data.
41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
- 41.1 Special Provisions-The special clauses setting forth conditions or requirements peculiar to the specific Project, supplementing the General Conditions and Supplementary Conditions and taking precedence over any condition or requirements of the General Conditions and Supplementary Conditions with which they are in conflict.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site. All Subcontractors shall be deemed to be agents of the Contractor.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents to provide the following: (i) the Owner full time, uninterrupted, continuous operation of the work; and (ii) all required functional, performance, and operational or startup testing has been successfully demonstrated for all components, devices, equipment, and systems to the satisfaction of the

Engineer in accordance with the requirements of the Specifications; and (iii) all required inspections and other work necessary for the Engineer to certify “substantially complete” have been completed. , so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.

44.1 Submittals – All administrative documents, Shop Drawings, Samples, product data, manufacturer’s literature, quality control documents, design related documents, record documents, contract close-out documents, and/or any other specified document prepared or assembled by or for Contractor and submitted by Contractor to the Owner and/or Engineer.

45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.

46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.

47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.

47.1 Surety or Sureties—The corporate body which is bound by such bonds as are required with and for the contractor, and which engages to be responsible for the entire and satisfactory fulfillment of the contract and for any and all requirements as set out in the specifications, contract or plans.

48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

49. *Unit Price Work*—Work to be paid for on the basis of unit prices.

50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, materials, tools, equipment, incidentals, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order

following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

52. Working Day. Any day, other than a City holiday pursuant to Chattanooga City Code or Sunday, on which the approximate normal working forces of the Contractor may proceed with regular work for at least six hours toward completion of the work, unless work be suspended for causes beyond the contractor control.

1.02 Terminology

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

2. Where the word “similar” occurs in the Contract Document, it shall have a general meaning and not be interpreted as being identical, and all details shall be worked out in relation to their location and their connection with other parts of the Work.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents; or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

- c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

- 1, The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor ~~and Owner~~ shall ~~each~~ deliver to the ~~Owner~~~~other~~, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which ~~Owner~~~~either of~~ ~~them~~ or any additional insured may reasonably request) which Contractor ~~is and Owner~~ ~~respectively are~~ required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

- A. Owner ~~shall~~will furnish to Contractor up to ~~ten~~four printed or hard copies of the ~~Drawings and Project Manual~~Contract Documents and one counterpart of the executed Contract Agreement. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

- A. ~~The~~ Contract Times will commence to run on the ~~thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated~~ date established in the

Notice to Proceed. A Notice to Proceed may be given at any time within ~~30-60~~ days after the Effective Date of the Agreement. ~~In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.~~

2.04 *Starting the Work*

- A. Contractor ~~shall~~may start to perform the Work on the date when the Contract Times commence to run. The Contractor shall begin the work within ten days of the date of the Notice to Proceed. The Contractor shall notify the City and the Engineer two working days in advance of the date he will begin onsite operations. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the ~~Commencement of the Contract Time~~Effective Date of the Agreement (unless otherwise specified in Section 01 32 16 – Construction Schedules of the General Requirements), Contractor shall submit to Engineer for timely review:
1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
 2. a preliminary Schedule of Submittals; which indicates each required Submittal and the dates for submitting, time for reviewing and processing each Submittal (periodic Submittals may be listed by a common monthly date); and
 3. a preliminary Schedule of Values for all of the Work in a format acceptable to the Engineer and in accordance with the requirements specified in Section 01 32 16 – Construction Schedules of the General Requirements. which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 Initial Acceptance of Schedules

- A. ~~At least 10 days before submission of the first Application for Payment a~~ Within ten days after the preconstruction conference a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
1. The Progress Schedule will be acceptable to Engineer as being the Contractor's schedule for the if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor. The Progress Schedule may subsequently be adjusted in accordance with Paragraph 6.04 and applicable provisions of Section 01 32 16 – Construction Schedules of the General Requirements.
 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals. The Schedule of Submittals may subsequently be adjusted in accordance with Paragraph 6.04 and applicable provisions of Section 01 32 16 – Construction Schedules of the General Requirements.
 3. Contractor's Schedule of Values will be acceptable to the Engineer as to form and substance if it is provided in accordance with the requirements specified in Section 01 32 16 – Construction Schedules of the General Requirements.~~provides a reasonable allocation of the Contract Price to component parts of the Work.~~

ARTICLE 3 – CONTRACT DOCUMENTS; INTENT, AMENDING, REUSE

3.01 Intent

- A. The individual components of the Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.
- D. Each and every clause or other provision required by law to be inserted in these Contract Documents shall be deemed to be inserted herein, and they shall be read and enforced as though it were included herein, and if through mistake or otherwise, any such provision is not inserted,

or if not correctly inserted, then upon the application of either party, the Contract Documents shall forthwith be amended to make such insertion.

E. “Imperative” or “Command” type language is used in the Contract Documents. This command language refers to and is directed to the Contractor.

F. Emphasis, such as italics, underlining, bold text or quotes, may have been used throughout the Contract Documents. Use of emphasis shall not change the meaning of the term emphasized.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents. Tentative specifications shall be construed as current unless otherwise noted. Where obsolete Federal Specifications have been referenced, they shall be superseded by the Federal Specification in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids).

2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3. All sections of governing standard specifications relating to measurement and payment shall not apply to the work specified herein.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor’s Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge or reasonably should have known thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).
2. In resolving inconsistencies within the Contract Documents, precedence shall be given in the following descending order:
 - a. Change Orders
 - b. Work Change Directives
 - c. Field Orders
 - d. Engineer's written interpretations and clarifications
 - e. Notice to Proceed
 - f. Addenda
 - g. Contract Agreement
 - h. Supplementary Conditions
 - i. General Conditions
 - j. Specifications

k. Drawings

1. Schedules on Drawings

2. Notes on Drawings

3. Details on Drawings

4. Large Scale Drawings

5. Small Scale Drawings

6. Dimensions given as Figures

7. Scaled Dimensions

l. Bidding Requirements

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order; or

~~2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or~~

~~3.~~ Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

3.07 *Contract Times*

- A. All Contract Times and time limits stated in the Contract Documents are of the essence of the Agreement.
- B. The Contractor shall proceed with the Work at a rate of progress which will ensure completion within the Contract Times.
- C. It is expressly understood and agreed by and between the Contractor and the Owner, that the Contract Times for the Work described herein are reasonable time, taking into consideration the average climatic and economic conditions, and other factors prevailing in the locality of the Work.
- D. If the Contractor shall fail to perform the Work required within the Contract Times, or extended Contract Times if authorized by Change Order, then the Contractor shall pay to the Owner the full amount of liquidated damages specified in the Contract Documents for each calendar day that the Contractor shall be in default after the Contract Times stipulated in the Contract Documents.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements

for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide, at his own expense and without liability to the City, for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

D. Prior to the issuance of the Notice to Proceed, the City will have obtained most of the land and rights-of-way, including easements, necessary for carrying out and for the completion of the work to be performed pursuant to these Contract Documents, unless mutually agreed or specified in the Specifications. In the event all land and rights-of-way have not been obtained as herein contemplated before construction begins, the Contractor shall begin the work upon such land and rights-of-way as the City may have previously acquired, and no claim for damages whatsoever will be allowed by reason of the delay in obtaining the remaining land and rights-of-way. Should the City be prevented or enjoined from proceeding with the work, or from authorizing its prosecution, either before or after the commencement, by reason of any litigation, or by reason of its inability to procure any lands or rights-of-way for the work, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay, or to withdraw from the contract except by consent of the City; but time for completion of the work will be extended to such time as the City determines will compensate for the time lost by such delay, such determination to be set forth in writing.

4.02 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. those reports ~~known to Owner~~ of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by the Engineer in preparing the Contract Documents; and
 - 2. those drawings ~~known to Owner~~ of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities that have been utilized by the Engineer in preparing the Contract Documents).
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
2. is of such a nature as to require a change in the Contract Documents; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, ~~will~~may be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

- b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew or should have known of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
 3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. General

1. The Contractor shall notify the owners of adjacent utilities when the prosecution of the work may affect the utility facilities or operation.
2. The Contractor shall perform and carry on the work so as not to interfere with or damage utility facilities in the vicinity of the work. The Contractor shall take every possible precaution to properly protect and preserve, including temporary supports and bracing where necessary, the utility facilities from damage, injury or displacement. The Contractor shall remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any subcontractor or any person directly or indirectly employed or engaged by the Contractor or a subcontractor or any person for whose acts the Contractor or a subcontractor is liable.
3. The City and the Engineer will not be responsible for any delay in performing the work resulting from the existence, removal or adjustment of any utility facilities. Additional costs incurred by the Contractor as a result thereof shall be borne solely by the Contractor.
4. Utility facilities, such as water mains, gas mains, storm sewers, sanitary sewers, telephone lines, power lines and buried facilities and structures in the vicinity of the work are indicated

on the drawings only to the extent such information has been made available to or discovered by the Engineer during the course of preparing the drawings. The actual locations of the utility facilities may vary from the locations shown, and there may be utility facilities existing that are not indicated on the Drawings. It is understood and agreed that there is no guarantee as to the accuracy or completeness of the utility information indicated on the drawings, and all responsibility for the accuracy or completeness thereof is expressly disclaimed. Generally, service connections are not indicated on the Drawings.

5. The Contractor shall be solely responsible for locating all existing underground facilities, including service connections, in advance of excavating, trenching or other work, by contacting the owners of the facilities or prospecting. The Contractor shall use his own information and shall not rely upon the information shown on the Drawings concerning utility facilities.
6. In the event of accidental damage to or disruption of utilities by the Contractor or any of his subcontractors or agents, the Contractor shall immediately take all necessary steps to replace any pieces of damaged equipment and all damaged materials, make all necessary repairs and restore all services to normal. The Contractor shall engage any and all required additional labor, individuals, subcontractors or other outside services which may be deemed necessary, to operate on a continuous "around-the-clock" basis until services are restored. He shall also provide and install all required equipment and materials to maintain temporary emergency services for uninterrupted use of facilities. All costs involved in making the repairs and restoring the disrupted service to normal shall be borne by the Contractor responsible for such disruption of services, and he shall be fully responsible for any and all damage claims resulting from such disruption.
7. Under no circumstances shall the Contractor or any of his subcontractors or agents disrupt or disconnect any type of facility whatsoever without first obtaining the written permission of the utility owner to do so. Request for disruption or disconnection shall state:
 - a. The location of the required disconnect and which utility is concerned.
 - b. The exact date and time at which the disconnect will be required.
 - c. The duration of the proposed disconnect or interruption.
8. Where it is necessary to temporarily interrupt services, the Contractor shall notify the utility owner, both before the interruption and again immediately before service is resumed. Before disconnecting any pipes or cables, the Contractor shall obtain permission from the owners thereof, or shall make suitable arrangements for their disconnection by the owners. Where it is necessary to temporarily interrupt house services, the Contractor shall notify the house owner or occupant, both before the interruption and again immediately before service is resumed. Should underground utilities or structures be encountered that are in minor conflict with the alignment or gradient of the proposed work, the proposed work may be adjusted by the Engineer where such adjustment is feasible and will not interfere with the operation of the proposed system. No payment will be made for these adjustments.

9. Where major conflicts in the proposed work and existing utilities or structures occur and adjustment of the new work is not feasible, then the Engineer may revise the alignment and/or grade to suit these conditions. If, in the opinion of the City, these revisions are necessary and are outside the scope of the bid items, they will be paid for as extra work.

B. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

BC. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
2. If Engineer concludes that a change in the Contract Documents is required, a Field Order, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall may be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that caused a change as described in Paragraph A.9 of this Article 4.04. was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to

agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

- D. The dimensions and descriptions given on the Drawings for adjacent work by others, if any, (including any existing facilities or utilities previously constructed for Owner) are based on the design drawings and not as-built drawings. Prior to commencing the Work, the Contractor shall verify all as-built conditions and information whenever existing facilities or utilities may impact the Work. Failure of Contractor to so verify all as-built conditions prior to commencing the Work shall bar Contractor from later seeking additional compensation for conflicts with existing facilities or utilities.
- E. Prior to the construction or installation of any proposed facility or pipeline, the Contractor shall expose all existing utilities true to their vertical and horizontal location, within the vicinity of the Work. In order to avoid conflicts between existing and proposed facilities or utilities, the Contractor shall either relocate the existing or proposed utility on a temporary or permanent basis, or shall take whatever means necessary to protect the existing facilities or utilities during the installation of proposed utilities, as approved by the Engineer. No additional payment will be made for the relocation of existing utilities or for any work associated with the protection of existing facilities or utilities.

4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.
- B. Engineer may check the lines, elevations, and reference marks set by Contractor, and Contractor shall correct any errors disclosed by such check. Such a check shall not be considered as approval of Contractor's work and shall not relieve Contractor of the responsibility for accurate construction of the entire Work. Contractor shall furnish personnel to assist Engineer in checking lines and grades.
- C. The Contractor shall review the Contract Documents and the Project site to determine the presence and location of any property or rights-of-way monuments or markers, and to assess the possibility of disruption to these monuments or markers. It will be the Contractor's responsibility to flag, erect guard post, or provide offset references for the protection or the re-monumentation of these property or rights-of-way monuments or markers. In the event these monuments or markers are covered over or disturbed, it will be the Contractor's responsibility to employ a surveyor licensed in the state of **that the Project is located** to re-establish those monuments or markers of property or rights-of-way, which were present prior to Work on the Project.

- D. It shall be the Contractor's responsibility to verify all reference points shown on the Contract Documents prior to beginning Work on the site. This verification shall be conducted by professionally qualified personnel in a manner which will verify the accuracy of the information shown in the Contract Documents. On projects which involve the connection to, or additions to existing structures, the elevations of these existing structures shall also be verified. Any findings which differ from those shown on the Contract Documents shall be submitted in writing to the Engineer for resolution.
- E. Additional surveys necessary for the construction staking shall be performed by the Contractor, the cost of which shall be incorporated into the appropriate items of Work. On projects in which payment is classified by depth of cut, the construction staking shall be performed in a manner that will allow for the determination of cut classification.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such

notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may issue a Work Change Directive or Change Order as appropriate regarding said condition. ~~order the portion of the Work that is in the area affected by such condition to be deleted from the Work.~~ If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment ~~becomes due~~ is made by the Owner or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized ~~in the jurisdiction in which the Project is located~~ by the State of Tennessee to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as ~~may be provided below; in the Supplementary Conditions.~~
1. Surety shall be in good standing with the Tennessee Department of Commerce and Insurance.
 2. Surety and Insurers must have an A.M. Best Financial Strength Rating of A or higher, with a Financial Size Category of X or higher.
 3. The surety shall have an underwriting limitation in Circular 570 in excess of the Contract Amount.

4. No surety will be accepted who is now in default or delinquent on any bond.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. ~~Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.~~
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 - 4. claims for damages insured by ~~reasonably~~ available personal injury liability coverage which are sustained:
 - a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

- b. by any other person for any other reason;
- 5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
- 6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

- 1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
- 2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
- 3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
- 4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
- 5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
- 6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, ~~Owner~~Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof ~~(subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations)~~. This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
5. allow for partial utilization of the Work by Owner;
6. include testing and startup; and
7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.

- ~~B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors,~~

~~members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.~~

~~BE.~~ All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

~~D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.~~

~~E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.~~

5.07 Waiver of Rights

A. Owner and Contractor intend that all policies purchased in accordance with Paragraphs 5.04 and 5.06 by Contractor will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. ~~Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused.~~ None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by OwnerContractor as trustee or otherwise payable under any policy so issued.

~~B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:~~

- ~~1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and~~
 - ~~2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.~~
- ~~C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.~~

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner ~~as fiduciary~~ for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner ~~as fiduciary~~ shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner ~~as fiduciary~~ shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner ~~as fiduciary~~ shall adjust and settle the loss with the insurers. ~~and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.~~

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If ~~either Owner or Contractor~~ has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by ~~the other party~~ Contractor in accordance with this Article 5 on the basis of ~~non-conformance~~ its not complying with the Contract Documents, ~~the objecting party shall so~~ Owner will notify ~~the other party~~ Contractor in writing thereof within 10 days ~~after receipt of the certificates (or other evidence requested) required by~~ of the date of delivery of such certificate to Owner in accordance with Paragraph 2.01.B. ~~Owner and~~ Contractor shall ~~each~~ provide ~~to the other~~ such additional information in respect of insurance provided by Contractor as ~~the other~~ Owner may reasonably request. ~~If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required~~

~~coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.~~

B. All policies and bonds shall be subject to approval by the City Attorney. Should the City Attorney at any time in his sole discretion determine that the insurance policies and certificate provided may not be sufficient to protect the interests of the City because of the insolvency of the insurance company or otherwise, the Contractor shall replace such policies with policies meeting his approval.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner ~~chooses~~finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 –CONTRACTOR’S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, provide quality control, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Any method of work suggested by the City or Engineer, but not specified, shall be used at the risk and responsibility of the Contractor; and the City and Engineer will assume no responsibility therefore. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall ~~have on site assign~~ a competent ~~resident~~ superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. Contractor shall also designate, in writing, a representative, hereinafter referred to as Project Manager, assigned to the Project on a full-time basis during execution of the Work who shall have the authority to act on behalf of Contractor, including executing the orders or directions of the Engineer without delay. This Superintendent and/or Project Manager shall have full authority to promptly supply products, tools, plant equipment, and labor as may be required to diligently prosecute the Work. All communications given to or received from the Superintendent and/or the Project Manager shall be binding on Contractor.

~~C. If at any time during the Project the Superintendent or Project Manager leaves the Project site while Work is in progress, Engineer shall be notified and provided with the name of Contractor's representative having responsible charge.~~

~~CD. Contractor shall also designate the person responsible for Contractor's quality control while Work is in progress. Engineer shall be notified in writing prior to any change in quality control representative assignment.~~

~~DE. Prior to the Commencement of the Contract Time, Contractor shall furnish to the Owner and Engineer the names, resumes, 24 hour contact information and other relevant information associated with the Project Manager and the Superintendent that are to be assigned to this project. The Project Manager and Superintendent must be acceptable to the Owner and Engineer.~~

6.02 Labor; Working Hours

A. Contractor shall provide competent, skilled, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site. Contractor shall, upon demand from the Engineer, immediately remove any manager, superintendent, foreman or workman whom the Engineer or Owner may consider incompetent or undesirable.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any City holiday pursuant to the Chattanooga City Code legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

C. Regular working hours may be Monday through Friday, excluding holidays, occurring between the hours of 7:00 AM and 6:00 PM, unless restricted otherwise. Contractor shall establish regular scheduled work times, e.g., four 10-hour days or, five 8-hour days, or five 10-hour days within the hours and days allowed above. Approval for specific work outside regular scheduled work times shall be requested no less than 48 hours prior to the requested work period. Contractor shall request approval of changes in regular scheduled work times no less than one week prior to the desired change. Occasional unscheduled overtime on weekdays may be permitted provided reasonable notice is given to Engineer. Night work will not be established as a regular procedure, excluding emergencies, except with written permission. Such permission, if granted, shall be upon such terms and conditions deemed appropriate in the Engineer's sole discretion.

D. Contractor shall pay all extra costs incurred by the Owner associated with work, outside of normal working hours, including additional support services, inspection services, testing services, utilities or other applicable costs. The cost associated with the Owner's inspection overtime will be the amounts as provided in the Supplementary Conditions per hour per individual, depending upon individuals assigned to the Project, the type of work being inspected, and the date of the invoice; i.e., allowing for salary escalation. Contractor will not be

responsible for extra costs associated with inspection overtime for work in excess of 40 hours per week when such overtime work is explicitly required by the Contract Documents.

E. Except in the case of emergencies or other unusual circumstances, no work shall be permitted on the project on Sunday or locally observed national holidays.

F. The Engineer will determine to what extent extraordinary onsite personnel work is required during Contractor's overtime work or working hours outside regular scheduled work hours.

G. During unfavorable weather, wet ground, or other unsuitable construction conditions, the Contractor shall confine his operations to work which will not be affected adversely thereby. No portion of the work shall be constructed under conditions which would affect adversely the quality or efficiency thereof, unless special means or precautions are taken by the Contractor to perform the work in a proper and satisfactory manner.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, quality control, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, ~~and if not specified~~, shall be of good quality, ~~and~~ new and unused, except as otherwise provided in the Contract Documents and shall be installed in an undamaged condition. All products provided on this Project shall be products currently manufactured by the manufacturer, i.e., products shall not be discontinued or out-of-date products nor shall they be of the last production run of the product. Contractor shall incorporate the previous sentence in any contract or agreement between Contractor and subcontractor or supplier supplying products provided on this Project. All special warranties and guarantees required by the ~~Specifications~~Contract Documents shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

D. Without limiting the responsibility or liability of the Contractor pursuant to this agreement, all warranties given by manufacturers on materials or equipment incorporated in the work are hereby assigned by the Contractor to the Owner. Such assignment shall be effective upon completion of Contractor's warranty period. If requested, the Contractor shall execute formal assignments of said manufacturer's warranties to the Owner. All such warranties shall be directly enforceable by the Owner. Such assignment shall in no way affect the Contractor's responsibilities and duties during the warranty period.

- E. Wherever a stock size of manufactured item or piece of equipment is specified by its nominal size, it shall be the responsibility of the Contractor to determine the actual space requirements for setting and for entrance to the setting space and to make all necessary allowances and adjustments therefor in his work without additional cost to the City.
- F. Equipment and Construction Plant. All equipment and construction plant shall be suitable to produce the quality of work and materials required for the satisfactory completion of the work within the Contract Time and shall be satisfactory to the Engineer. The Contractor shall provide adequate and suitable equipment and construction plant to meet the requirements of the work as specified in these Contract Documents. The Contractor shall remove unsuitable equipment from the work and add to the construction plant when ordered to do so by the Engineer. The Contractor shall obtain written permission from the City prior to constructing temporary buildings or other structures on land owned or leased by the City. If a permit is granted, said buildings or other structures shall comply with all applicable regulations regarding their construction and maintenance and shall be satisfactory to the City

6.04 *Progress Schedule*

- A. Contractor shall provide all resources, labor, materials, equipment, services, etc. necessary to adhere to the Progress Schedule established in accordance with Paragraph 2.07 and Section 01 32 16 – Construction Schedules of the General Requirements as it may be adjusted from time to time as provided below.
1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) ~~proposed adjustments in and~~ Section 01 32 16 – Construction Schedules of the General Requirements) an updated –the Progress Schedule that will not result in changing the Contract Times and an updated Schedule of Submittals with each partial payment request, but no less than monthly. Contractor’s failure to provide acceptable updated Progress Schedule and Schedule of Submittals will delay processing of the pay request until receipt of the acceptable updated Progress Schedule and/or an updated Schedule of Submittals. Such ~~adjustments will~~ updates and adjustments shall comply with any provisions of Section 01 32 16 – Construction Schedules of the General Requirements applicable thereto.
 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.
 3. Number of anticipated days associated with weather conditions, as defined in the General Requirements, shall be included on the critical path of Project Schedule.
- B. The Contractor shall implement the detailed schedule of activities to the fullest extent possible between Project Coordination Meetings.
- C. The Contractor shall prepare its daily report by 10:00 a.m. of the day following the report date. This daily report will contain, as a minimum, the weather conditions; number of workers by craft, including supervision and management personnel on site; active and inactive equipment on site; work accomplished by schedule activity item; problems; and visitors to the jobsite.

- D. If a current activity or series of activities on the overall project schedule is behind schedule and if the late status is not due to an excusable delay for which a time extension would be forthcoming, the Contractor shall attempt to reschedule the activity to be consistent with the overall Project schedule so as not to delay any of the Contract milestones. The Contractor agrees that:
1. The Contractor shall attempt to expedite the activity completion so as to have it agree with the overall progress schedule. Such measures as the Contractor may choose shall be made explicit during the Project Coordination Meeting.
 2. If, within two weeks of identification of such behind-schedule activity, the Contractor is not successful in restoring the activity to an on schedule status, the Contractor shall:
 - a. Carry out the activity with the scheduled crew on an overtime basis until the activity is complete or back on schedule.
 - b. Increase the crew size or add shifts so the activity can be completed as scheduled.
 - c. Commit to overtime or increased crew sizes for subsequent activities, or some combination of the above as deemed suitable by the Engineer.
 3. These actions shall be taken at no increase in the Contract amount.
- E. The Contractor shall maintain a current copy of all construction schedules on prominent display in the Contractor's field office at the Project site.
- F. The Contractor shall cooperate with the Owner and Engineer in all aspects of the Project scheduling system. Failure to implement the Project scheduling system or to provide specified schedules, diagrams and reports, or to implement actions to re-establish progress consistent with the overall progress schedule may be causes for withholding of payment.

6.05 *Substitutes and "Or-Equals"*

- A. See Section 01 25 00 – Substitutions and Options of the General Requirements. Whenever — an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
1. "Or Equal" Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or equal" item, in which ease review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

- ~~a. in the exercise of reasonable judgment Engineer determines that:~~
- ~~1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;~~
 - ~~2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and~~
 - ~~3) it has a proven record of performance and availability of responsive service.~~
- ~~b. Contractor certifies that, if approved and incorporated into the Work:~~
- ~~1) there will be no increase in cost to the Owner or increase in Contract Times; and~~
 - ~~2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.~~
- ~~2. Substitute Items:~~
- ~~a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.~~
- ~~b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.~~
- ~~c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.~~
- ~~d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:~~
- ~~1) shall certify that the proposed substitute item will:~~
 - ~~a) perform adequately the functions and achieve the results called for by the general design,~~
 - ~~b) be similar in substance to that specified, and~~
 - ~~e) be suited to the same use as that specified;~~
 - ~~2) will state:~~
 - ~~a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,~~

- ~~b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and~~
- ~~e) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;~~
- ~~3) will identify:~~
 - ~~a) all variations of the proposed substitute item from that specified, and~~
 - ~~b) available engineering, sales, maintenance, repair, and replacement services; and~~
 - ~~4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.~~
- ~~B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.~~
- ~~C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.~~
- ~~D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.~~
- ~~E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.~~
- ~~F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or equal" at Contractor's expense.~~

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Acceptance of any Subcontractor, other person or organization by Owner shall not constitute a waiver of any right of Owner to reject defective Work. Contractor shall not be required to employ any Subcontractor, ~~Supplier,~~ or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, ~~and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued.~~ No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade. Such arrangement shall not operate to make the

Engineer or the City an arbitrator to establish subcontract limits between Contractor and Subcontractor.

- G. All Work performed for Contractor by a Subcontractor or Supplier ~~will~~shall be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. ~~Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.~~
- H. Owner or Engineer may furnish to any Subcontractor, Supplier or other person or organization, to the extent practicable, information about amounts paid on their behalf to Contractor in accordance with Contractor's Applications for Payment.
- I. Specialty Subcontractors: Contractor shall utilize the services of Specialty Subcontractors on those parts of the Work which is declared as specialty work in Specifications and which, under normal contracting practices, is best performed by Specialty Subcontractors, as required by the Engineer in Engineer's sole discretion, at no additional cost to the Owner. If Contractor desires to self-perform specialty work, Contractor shall submit a request to the Owner, accompanied by evidence that Contractor's own organization has successfully performed the type of work in question, is presently competent to perform the type of work, and the performance of the work by Specialty Subcontractors will result in materially increased costs or inordinate delays.
- J. The Contractor shall perform a minimum of 50 percent of the onsite labor with its own employees.

6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other

professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction, permits and licenses temporary and permanent permits and licenses, necessary and incidental to the due and lawful prosecution of the work, including all permits on any part of the Work as required by law in connection with the Work. Owner ~~shall~~ will assist Contractor, when required by the permitting agency necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.
- B. Railway Crossings. When the work encroaches upon the right-of-way of any railway, the City will secure for the Contractor all the necessary easements or authority to enter upon such right-of-way for the prosecution and completion of the work. Contractor shall, however, take such special precaution for the safety of the work and the traveling public as may be necessary, by sheeting, bracing, and thoroughly supporting the sides of any excavation and supporting and protecting any adjacent structures. Contractor shall be bound by all requirements as stated in Supplemental Agreement between the City and railroad authority, as included in an appendix to these Contract Documents.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and

Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times, or both. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

D. It is understood and agreed that the Contractor shall be familiar with and shall observe and comply with, all Federal, State, County, and City laws, codes, ordinances, regulations, orders, and decrees, including air and water pollution and noise abatement regulations, existing, or enacted subsequent to the execution of the Contract, that in any manner affect those engaged or employed in the work, or the materials or equipment used in the work, or which in any way affect the conduct of the work. The Contractor shall strictly observe all applicable laws and regulations as to public safety, health and sanitation. No pleas of misunderstanding or ignorance on the part of the Contractor will in any way serve to modify or mitigate the provisions of these Contract Documents. The Contractor and his Surety shall indemnify and save harmless the City and the Engineer and all their officers, agents, and servants against any claim or liability arising from, or based on the violation of, any such law, code, ordinance, regulation, order or decree, whether by himself, his agents or his employees.

EE. Where professional engineering and/or architectural services are required in connection with any of the components required by the Contract, all Bidders and component suppliers must make certain that there is full compliance with all applicable laws of the state in which the Project is located and any other state governing professional engineering and/or architecture. The Owner and Engineer do not warrant that any entity listed as an acceptable manufacturer is or will be in compliance with such laws.

FG. Any fines levied against the Owner for failure of Contractor to properly maintain required NPDES erosion and sediment control measures or any other related requirements will be deducted as set-offs from payments due Contractor.

6.10 Taxes

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 Use of Site and Other Areas

A. Limitation on Use of Site and Other Areas:

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to

any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
 3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site Record Documents as specified in the Section 01 78 39 – Record Documents of the General Requirements ~~one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference.~~ Upon completion of the Work, these record documents, Samples, and Shop Drawings ~~will~~ shall be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve

Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all ~~necessary~~ precautions for the safety of, and shall provide the ~~necessary~~ protection to prevent pollution of or damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;
 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
- G. The property, improvements or facilities at the site shall be replaced or restored to a condition as good as when Contractor entered upon the Site. In case of failure on the part of Contractor to restore such property, or make good such damages or injury, the Owner may, after 48 hours written notice, or sooner in the case of an emergency, proceed to repair, rebuild, or otherwise

restore such property, improvements or facilities as may be deemed necessary. The cost thereof will be deducted from any monies due or which may become due Contractor under this Contract.

H. Reasonable care shall be taken during construction to avoid damage to vegetation. Ornamental shrubbery and tree branches shall be tied back, where appropriate, to minimize damage. Trees which receive damage to branches shall be trimmed of those branches to improve the appearance of the tree. Tree trunks receiving damage from equipment shall be treated with a tree dressing.

I. The Contractor shall give due notice to any controlling person, department, or public service company, prior to adjusting items to grade and shall be held strictly liable to the City if any such items are disturbed, damaged or covered up during the course of the work.

J. Fire hydrants on or adjacent to the work shall be kept accessible to the fire-fighting apparatus at all times, and no material or obstruction shall be placed within 10 feet of any hydrant. Adjacent premises must be given access, as far as practicable, and obstruction of sewer inlets, gutters and ditches will not be permitted.

K. Public Safety and Convenience

1. The Contractor shall conduct his operations in a manner that will offer the least possible obstruction and inconvenience to the public and he shall not have under construction an amount of work greater than he can prosecute properly with due regard to the rights of the public.

2. Construction operations shall be conducted in a manner that will cause as little inconvenience as possible to abutting property owners. Convenient access to driveways, houses, buildings or other facilities in the vicinity of the work shall be maintained and temporary access facilities for public roadways shall be provided and maintained in satisfactory condition.

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

B. The Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the work, all necessary safeguards, including sufficient lights and danger signals on or near the work; he shall erect suitable railings, barricades, covers, or other protective devices about unfinished work, open trenches, holes, embankments or other hazards and obstructions; where hazards to workmen or the public exist. The Contractor shall provide, at all times, all necessary watchmen on the project, for the safety of employees, delivery personnel, and the

general public, and to diligently guard and protect all work and materials, including Owner-furnished equipment. Construction equipment shall be suitably night-marked and lighted as necessary for safety considerations. No separate payment will be made for providing lights on vehicles and equipment, signs, barricades, lights, flags, watchmen and other protective devices, and the costs thereof shall be included in the Contract Price(s).

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings, ~~and~~ Samples and Other Submittals*

- A. Contractor shall submit ~~Shop Drawings and Samples~~ Submittals to Engineer for review and approval in accordance with the accepted or adjusted Schedule of Submittals (as required by Paragraph 2.07). Each submittal willshall be identified as Engineer may require.

1. *Shop Drawings:*

- a. Submit number of copies specified in the Section 01 33 23 – Shop Drawings, Product Data and Samples of the General Requirements.
- b. Data shown on the Shop Drawings willshall be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

- a. Submit number of Samples specified in the Specifications.
- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

- B. Where ~~a Shop Drawing or Sample~~ any Submittal is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

- a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each Shop Drawing and Sample submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.
 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will return as incomplete or will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval or disapproval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval or disapproval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notationField Order thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

4. Review by the City or Engineer of any plan or method of work proposed by the Contractor shall not relieve the Contractor of any responsibility therefor, and such review shall not be considered as an assumption of any risk or liability by the City or Engineer, or any officer, agent, or employee thereof. The Contractor shall have no claim on account of the failure or inefficiency of any plan or method so reviewed.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

F. Excessive Submittal Resubmission: Engineer will record time required by Engineer for excessive Submittal review occasioned by Contractor's resubmission, in excess of two resubmissions of any required Submittal, caused by unverified, unchecked or unreviewed, incomplete, inaccurate or erroneous, or nonconforming Submittals. Upon receipt of Engineer's accounting of time and costs, Contractor will reimburse Owner for the charges of Engineer's review for excessive resubmissions through set-offs from the recommended Owner payments to Contractor as established in Paragraph 14.02.D. of these General Conditions.

G. In the event that Contractor provided a submittal for a previously approved item, whether such is as a substitution or in addition to the previously approved item, Contractor shall reimburse Owner for Engineer's charges for such time as may be required to perform all reviews of the substitute item, unless the change is specifically requested by the Owner.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a ~~Shop Drawing or Sample s~~Submittal or the issuance of a notice of acceptability by Engineer;
 6. any inspection, test, or approval by others; or
 7. any correction of defective Work by Owner.

6.20 *Indemnification and Liability*

- A. It is understood and agreed that the Contractor shall be deemed and considered an independent contractor in respect to the work covered by these Contract Documents, and shall assume all risks and responsibility for casualties of every description in connection with the work, except that he shall not be held liable or responsible for delays or damage to work caused by acts of God, acts of public enemy, quarantine restrictions, general strikes throughout the trade, or freight embargoes not caused or participated in by the Contractor. The Contractor shall have charge and control of the entire work until completion and final acceptance of the work by the City. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of a person or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such person or entity .

- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor ~~under Paragraph 6.20.A~~ shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
1. the negligent preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 2. negligently giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.
- D. Contractor, Subcontractors, Suppliers and others on the Project, or their sureties, shall maintain no direct action against the Engineer, their officers, employees, affiliated corporations, consultants, and subcontractors, for any claim arising out of, in connection with, or resulting from the engineering services performed. Only the Owner will be the beneficiary of any undertaking by the Engineer.
- E. Defense of Suits: In case any action in court is brought against the City or the Engineer, or any officer, agent or employee of any of them, for the failure, omission, or neglect of the Contractor to perform any of the covenants, acts, matters, or things by this contract undertaken; or for injury or damage caused by the alleged negligence of the Contractor or his subcontractors or his or their agents, or in connection with any claim based on lawful demands of subcontractors, workmen, material-men, or suppliers, the Contractor shall indemnify, defend and save harmless the City and the Engineer and their officers, agents and employees, from all losses, damages, costs, expenses (including attorneys' fees), judgments, or decrees arising out of such action.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations,

specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

6.22 Project Coordination Meetings

- A. The Contractor shall participate in Project Coordination Meetings to be held on the site monthly, or more often if conditions warrant, to establish the current state of completion and revise the schedule as necessary. The Project Coordination Meeting will be conducted by the Owner and/or the Engineer.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 Related Work at Site

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times or both that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with

such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

- A. If Owner ~~intends to contract~~s with others for the performance of other work on the ~~Project at the Site~~, the following will be set forth in Supplementary Conditions:
1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination ~~with other contractors~~.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

7.04 *Claims Between Contractors*

- A. Should Contractor cause damage to the work or property of any separate contractor at the site, or should any claim arising out of Contractor's performance of the work at the site be made by any separate contractor against Contractor, Owner, Engineer, or any other person, Contractor shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by mediation, arbitration, or at law.

- B. Contractor shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold Owner, Engineer, and the officers, directors, employees, agents, and other consultants of each and any of them harmless from and against all claims, costs, losses and damages, (including, but not limited to, all fees and charges of engineers, architects, attorneys and other professionals and all court or arbitration or other dispute resolution costs) arising directly, indirectly or consequentially out of or resulting from any action, legal or equitable, brought by any separate contractor against Owner, Engineer, or the officers, directors, employees, agents, and other consultants of each and any of them to the extent based on a claim arising out of Contractor's performance of the Work. Should a separate contractor cause damage to the Work or property of Contractor or should the performance of work by any separate contractor at the site give rise to any other claim, Contractor shall not institute any action, legal or equitable, against Owner, Engineer, or the officers, directors, employees, agents, and other consultants of each and any of them or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any mediator or arbitrator which seeks to impose liability on or to recover damages from Owner, Engineer, or the officers, directors, employees, agents, or other consultants of each and any of them on account of any such damage or claim.
- C. If Contractor is delayed at any time in performing or furnishing Work by any act or neglect of a separate contractor, and Owner and Contractor are unable to agree as to the extent of any adjustment in Contract Times attributable hereto, Contractor may make a claim for an extension of times in accordance with Article 12. An extension of the Contract Times shall be Contractor's exclusive remedy with respect to Owner, and/or Engineer and the officers, directors, employees, agents, or other consultants of each and any of them for any delay, disruption, interference or hindrance caused by any separate contractor. This Paragraph does not prevent recovery from Owner, Engineer, and/or Designer for activities that are their respective responsibilities.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 Communications to Contractor

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 Replacement of Engineer

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer ~~to whom Contractor makes no reasonable objection,~~ whose status under the Contract Documents shall be that of the former Engineer.

8.03 Furnish Data

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 Pay When Due

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's shall not have any responsibilities, ~~if any,~~ with respect to purchasing and maintaining liability and property insurance ~~are set forth in Article 5.~~

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

8.13 Testing of Materials and Equipment

- A. The testing of materials shall be made by a competent laboratory or other person selected and paid for by the City. The Contractor shall submit samples of materials for testing as required by the Engineer. The cost of all retests made necessary by the failure of materials to conform to the requirements of these Contract Documents shall be paid by the Contractor.

ARTICLE 9 – ENGINEER’S STATUS DURING CONSTRUCTION

9.01 *Owner’s Representative*

- A. Engineer will be Owner’s representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner’s representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor’s executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer’s efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer’s visits and observations are subject to all the limitations on Engineer’s authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer’s visits or observations of Contractor’s Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work, but will not be on-site at all hours the Work is in progress. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer’s consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefore as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will have authority to determine the actual quantities and classifications of Unit Price Work performed by Contractor. If Engineer exercises such authority, Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and initial judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents, except that Owner shall determine whether bonds, certificates of insurance and release of liens comply with the Contract Documents.

- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

9.11 Authority of the City Engineer

- A. If the City has retained an engineer to assist the City Engineer in administering the contract, then the authority of the City Engineer shall be as specified herein. If the administration of the contract is performed by the City Engineer without having an engineer, then the authority of the City Engineer shall be as specified in this section and this Article 9.
- B. The general administration and observation of the performance and execution of the work under these Contract Documents is vested in the City Engineer. The detailed administration and observation of the performance and execution of the work is vested in the Engineer as set forth above.
- C. The City Engineer may authorize a person to act as the City Engineer's authorized representative or agent in carrying out the duties specified in these Contract Documents. The instructions of the City Engineer, or authorized representative, shall be strictly and promptly followed in every case.
- D. The City Engineer, or authorized representative, shall have authority to suspend operations at any time, without additional cost to the Owner, when the work, in the City Engineer's opinion, is not being carried out in conformity with the Drawings, Specifications, and other Contract Documents.
- E. The City Engineer, or authorized representative, may appoint Inspectors as are necessary to observe the performance of the work under these Contract Documents and the amount, character, and quality of materials supplied.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

1. Owner may, in anticipation of possibly ordering an addition, deletion or revision to the Work, request Contractor to prepare a proposal of cost and times to perform Owner's contemplated changes in the Work. Contractor's written proposal shall be transmitted to the Engineer promptly, but not later than fourteen days after Contractor's receipt of Owner's written request and shall remain a firm offer for a period not less than sixty days after receipt by Engineer.
2. Contractor is not authorized to proceed on an Owner contemplated change in the Work prior to Contractor's receipt of a Change Order (or Work Change Directive) incorporating such change into the Work.
3. Owner's request for proposal or Contractor's failure to submit such proposal within the required time period will not justify a claim for an adjustment in Contract Price or Contract Time (or Milestones).
4. The Owner shall not be liable to the Contractor for any costs associated with the preparation of proposal associated with the Owner's contemplated changes in the Work.

- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and
 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of

executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

B. In signing a Change Request Form, the Owner and Contractor acknowledge and agree that:

1. The stipulated compensation (Contract Price or Contract Time, or both) set forth in the Change Order includes payment for:
 - a. the Cost of the Work covered by the Change Order,
 - b. Contractor's fee for overhead and profit,
 - c. interruption of Progress Schedules,
 - d. delay and impact, including cumulative impact, on other work under the Contract Documents, and
 - e. extended home office and jobsite overhead;
2. the Change Order constitutes full mutual accord and satisfaction for the change to the Work;
3. No reservation of rights to pursue subsequent claims on the Change Order will be made by either party; and
4. No subsequent claim or amendment of the Contract Documents will arise out of or as a result of the Change Order.

10.04 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims and Disputes*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than ~~30-10~~ days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with written supporting data shall be delivered to the Engineer and the other party to the Contract within ~~60~~ 20 days (and monthly thereafter for continuing events) after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).
- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
 2. approve the Claim; or
 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 Cost of the Work

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of

the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, ~~bonuses~~, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

1. Full rental cost for rented, leased, and/or owned equipment shall not exceed the rates listed in the Rental Rate Blue Book published by Equipment Watch, a unit of Penton Media, Inc., as adjusted to the regional area of the Project. The most recent published edition in effect at the commencement of the actual equipment use shall be used.
2. Rates shall apply to equipment in good working condition. Equipment not in good condition, or larger than required, may be rejected by Engineer or accepted at reduced rates.
3. Equipment in Use: Actual equipment use time documented by the Engineer shall be the basis that the equipment was on and utilized at the Project site. In addition to the leasing rate above, equipment operational costs shall be paid at the estimated operating cost, payment category (and the table below), and associated rate set forth in the Blue Book if not already included in the lease rate.

The hours of operation shall be based upon actual equipment usage to the nearest full hour, as recorded by the Engineer.

<u>Actual Usage</u>	<u>Blue Book Payment Category</u>
<u>Less than 8 hours</u>	<u>Hourly Rate</u>
<u>8 or more hours but less than 7 days</u>	<u>Daily Rate</u>
<u>7 or more days but less than 30 days</u>	<u>Weekly Rate</u>
<u>30 days or more</u>	<u>Monthly Rate</u>

4. Equipment when idle (Standby): Idle or standby equipment is equipment on-site or in transit to and from the Work site and necessary to perform the Work under the modification but not in actual use. Idle equipment time, as documented by the Engineer, shall be paid at the leasing rate determined in 11.01.A.5.c., excluding operational costs.
5. Where a breakdown occurs on any piece of equipment, payment shall cease for that equipment and any other equipment idled by the breakdown. If any part of the Work is shutdown by the Owner, standby time will be paid during non-operating hours if

diversion of equipment to other Work is not practicable. Engineer reserves the right to cease standby time payment when an extended shutdown is anticipated.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to any of the Work that has been completed and accepted by the Owner, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D.), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee. If, however, any such loss or damage to the Work that has been accepted by Owner requires reconstruction and Contractor is placed in charge thereof, Contractor shall be paid for services, a fee proportionate to that stated in Paragraph 12.01.c.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as ~~telegrams~~, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.
- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:*
1. Contractor agrees that:
 - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance:*
1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- ~~D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.~~

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a ~~mutually agreed~~ lump sum value fixed by the Owner or by unit price values fixed by the Owner (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached where the method under Paragraph 12.01.B.2. is not selected by the Owner, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee*: The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or
2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent based on subcontractor's actual Cost of the Work;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor; except the maximum total allowable cost to Owner shall be the Cost of the Work plus a maximum collective aggregate fee for Contractor and all tiered Subcontractors of 26.8 percent.
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 Delays

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times ~~will~~may be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, quarantine restrictions, strikes, freight embargoes, acts of war (declared or not declared), or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor ~~shall~~may be entitled to an equitable adjustment in Contract Times, but not Contract Price, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.
- F. If the Progress Schedule reflects a completion date or milestone date prior to the completion date or milestone date established by the Contract Documents, this shall afford no basis to claim for delay should Contractor not complete the Work prior to the projected completion date. Should a change order be executed with a revised completion date or milestone date, the Progress Schedule shall be revised to reflect the new completion date or milestone date.

G. Abnormal Weather Delays

1. Extensions of Contract Time: If, in accordance with this Paragraph 12.03, the basis exists for an extension of time due to delays caused by abnormal weather, then an extension of time on the basis of abnormal weather may be granted only for the number of weather delay days in excess of the number of weather days listed as the Standard Baseline below for that month.

2. Standard Baseline for Average Climatic Range

a. The City has reviewed weather data available from the National Oceanic and Atmospheric Administration and determined a Standard Baseline of average climatic range for the State of Tennessee.

b. The Standard Baseline shall be regarded as the normal and anticipated number of calendar days for each month during which construction activity shall be expected to be prevented and suspended by cause of adverse weather. Suspension of construction activity for the number of days each month as listed in the Standard Baseline is to be included in the work and not eligible for an extension of the contract time.

c. The Standard Baseline, in days, is as follows:

<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>
<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>11</u>	<u>8</u>
<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>
<u>11</u>	<u>7</u>	<u>9</u>	<u>8</u>	<u>9</u>	<u>12</u>

3. Adverse Weather and Weather Delay Days

a. Adverse weather is defined as the occurrence of one or more of the following conditions which prevents only exterior construction activity or access to the site within a 24-hour period:

1. Precipitation (rain, snow, or ice) in excess of one-tenth inch liquid measure.

2. Temperatures which do not rise above 32 degrees F by 10:00 AM.

3. Standing snow in excess of one inch.

b. Adverse weather days may include, if appropriate, “dry-out” or “mud” days when:

1. Precipitation (rain, snow, or ice) exceeds one-tenth inch liquid measure, and

2. There is a hindrance to site access or site work, such as excavation, backfill, and footings; but

3. May accumulate at a rate no greater than 1 make-up day for each day or consecutive days of rain that total 1.0 inch or more, liquid measure, unless specifically recommended otherwise by the Engineer.

c. An adverse weather day may be counted only if adverse weather prevents work on the project for 50 percent or more of the Contractor's scheduled work day, including a weekend day or holiday if the Contractor has scheduled construction activity that day.

4. Documentation and Submittals

- a. Monthly submit Daily Jobsite Work Log showing which and to what extent construction activities have been affected by weather.
- b. Submit actual weather data to support a claim for the time extension obtained from nearest NOAA weather station or other independently verified source approved by the Engineer at the beginning of the Project.
- c. Maintain a rain gauge, thermometer, and clock at the jobsite. Keep daily records of precipitation, temperature, and the time of each occurrence throughout the Project.
- d. Use the Standard Baseline data provided in this section when documenting actual delays due to weather in excess of the average.
- e. Organize claim and documentation to facilitate evaluation on a basis of calendar month periods, and submit in accordance with the procedures for claims established in Article 10 of these General Conditions.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 Notice of Defects

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 Access to Work

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 Tests and Inspections

- A. Contractor is responsible for the initial and subsequent inspections of Contractor's Work to ensure that the Work conforms to the requirements of the Contract Documents. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests. Contractor shall establish an inspection program and a testing plan

acceptable to the Engineer and shall maintain complete inspection and testing records available to Engineer.

- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all non-contractor inspections, tests, or approvals required by the Contract Documents except:
1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.
- G. Tests required by Contract Documents to be performed by Contractor and that require test certificates to be submitted to Owner or Engineer for acceptance shall be made by an independent testing laboratory or agency licensed or certified in accordance with Laws and Regulations and applicable state and local statutes. In the event state license or certification is not required testing laboratories or agencies shall meet the following applicable requirements:
1. "Recommended Requirements for Independent Laboratory Qualification", published by the American Council of Independent Laboratories.
 2. Basic requirements of ASTM E329, "Standard of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction" as applicable.

3. Calibrate testing equipment at reasonable intervals by devices of accuracy traceable to either the National Bureau of Standards or accepted values of natural physical constants.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

B. If Owner stops Work under Paragraph 13.05.A. Contractor shall not be entitled to an extension of Contract Time or increase in Contract Price.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers,

architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

C. Contractor shall promptly segregate and remove rejected products from the Site.

D. If rejected products or Work is not removed within 48 hours, the Owner will have the right and authority to stop the Work immediately and will have the right to arrange for the removal of said rejected products or Work at the cost and expense of the Contractor.

13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions, and all to the satisfaction of the Owner:

1. repair such defective land or areas; or
2. correct such defective Work; or
3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) willshall be paid by Contractor.

- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect

to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

F. Repetitive malfunction of an equipment or product item shall be cause for replacement and an extension of the correction period to a date one year following acceptable replacement. A repetitive malfunction shall be defined as the third failure of an equipment or product item following original acceptance.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount ~~will~~shall be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time, as defined by the Engineer, after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

- C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A and as modified will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review five copies of an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. Retainage:

- a. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- b. No form of collateral in lieu of cash will be acceptable as retainage.
- c. Amounts retained by the Contractor from payments due to suppliers and subcontractors (expressed as a percentage) shall not exceed that being retained by the Owner.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due:*

1. ~~Ten~~ Thirty days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

- b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or
 - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement; if any.
 4. Items entitling Owner to retain set-offs from the amount recommended, include but are not limited to:
 - a. Owner compensation to Engineer at an estimated average rate as specified in the Supplementary Conditions per each extra personnel hour for labor plus expenses because of the following Contractor-caused events:
 - (1) Witnessing retesting of corrected or replaced defective Work;
 - (2) Return visits to manufacturing facilities to witness factory testing or retesting;
 - (3) Submittal reviews in excess of three reviews by Engineer for substantially the same Submittal;
 - (4) Evaluation of proposed substitutes and in making changes to Contract Documents occasioned thereby;
 - (5) Hours worked by Contractor, in excess of normal work hours as defined by Article 6.02 of the General Conditions, necessitating Engineer to work overtime;
 - (6) Return visits to the Project by Engineer for Commissioning Activities not performed on the initial visit;
 - b. Fines levied against the Owner for Contractor's performance of NPDES Erosion and Sedimentation Control Measures or other permit violations.

- c. The repair, rebuilding or restoration of property improvements or facilities by the Owner as outlined in Paragraph 6.13.
- d. Liability for liquidated damages incurred by Contractor as set forth in the Agreement.

E. Retainage Held as Security

1. Notwithstanding any other provision of this Contract to the contrary, in the event the City shall have reasonable grounds to suspect that:
 - (a) The Contractor or associated person has breached the Affidavit of No Collusion contained in these Contract Documents or has breached such an affidavit in any other contract which Contractor may have with City; or
 - (b) The Contractor or associated person has violated or participated in a violation of the Sherman Act (15 U.S.C. Sec. 1-2), or the Racketeer Influenced and Corrupt Organizations Act (18 U.S.C. Sec.1961-1968), or the Hobbs Act (18 U.S.C. Sec. 1951), or the mail or wire fraud statutes (18 U.S.C. Sec. 1341, 1343), the false statements statement (18 U.S.C. Sec. 1001), or other similar provision of Federal or State law in connection with this Contract or with any other contract which the Contractor or associated person has, had, or shall have with the City (including without limitation the submission of bids on such a contract);

then the City shall have the right to withhold and retain any retainage described in this section as security for any damage claim arising from such action.
2. For purposes of this section, the term "associated person" shall include (a) in the case of a corporation: the corporation, its officers, directors, shareholders, employees and agents, and its parents, subsidiaries or affiliates, whether in existence at the time of the violation or subsequently formed or acquired; (b) in the case of a partnership or joint venture: the partnership or joint venture, its general or limited partners and joint venturers, its officers, employees and agents; and (c) in the case of a sole proprietorship: the individual proprietor, and his employees and agents. Where a partner or joint venturer is a corporation, the partnership or joint venture shall have attributed to it the actions of persons attributable to the corporation under paragraph (a) of this subsection.
3. The City shall promptly notify the Contractor in writing of the exercise of its right to retain such amounts.
4. The City shall have the right to retain such funds until the City's damage claims are finally determined. The claim shall be "finally be determined" when a court of competent jurisdiction enters judgment on the merits of any claim made for damages by the City (unless City appeals that judgment, in which event, when the appeal is decided). In the event that City voluntarily waives his damage claim by written instrument signed on City's behalf, then such claim shall be "finally determined" at the time such waiver is effective. City covenants that it will commence an action for damages with respect to its damage claim as soon as

practicable after it exercises its right for retaining such amounts for the causes set forth in this paragraph.

5. In the event such a claim is finally determined in favor of City, any amount of retainage for such claim shall be applied to satisfy the judgment. Any excess of retainage hereunder over the amount of such judgment, or in the event that a damage claim is finally determined in favor of Contractor or its associated person, the amount shall be promptly paid to Contractor, together with interest, at the applicable rate for post-judgment interest set forth in T.C.A. Sec. 47-14-121, provided that interest shall not be paid upon amounts which City could have otherwise properly retained under other provisions of this Contract.

6. Any claim, dispute, or other matter arising out of or relating to City's retention of payment for a damage claim under this section shall not be subject to arbitration. The City's failure to retain all or a portion of any payment due under this Contract pursuant to this section, even if grounds for such retention exists, shall not constitute a waiver of any of City's rights under this section.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment, retainage notwithstanding, free and clear of all Liens.

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

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion. Specific items of Work that must be completed prior to the Engineer's issuance of a certificate of Substantial Completion include, but are not limited to, the following:

1. Correction of all deficient Work items listed by all state, local, and other regulatory agencies or departments.

2. All submittals must be received and approved by the Engineer, including but not necessarily limited to, the following:

a. Record documents.

b. Factory test reports, where required.

c. Equipment and structure test reports.

d. Manufacturer's Certificate of Proper Installation.

e. Operating and maintenance information, instructions, manuals, documents, drawings, diagrams, and records.

f. Spare parts lists.

3. All additional warranty or insurance coverage requirements have been provided.

4. All manufacturer/vendor-provided operator training is complete and documented.

5. Other items of Work specified elsewhere as being prerequisite for Substantial Completion.

- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
1. Owner at any time may ~~request-direct~~ Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to ~~be ready for~~ sufficiently progressed towards its intended use ~~and substantially complete~~. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work described in Paragraph 14.05.A.1 ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection and Final Acceptance of the Work*

~~A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.~~

A. Upon receipt of written notice from the Contractor that all items listed for completion or correction during the inspection for substantial completion have been performed and that the work has been completed in conformity with the Contract Documents, the Engineer shall promptly examine the work, in company with the City, making additional tests and investigations as he may deem proper and using due care and judgment normally exercised in the examination of the completed work by a properly qualified and experienced professional engineer and shall satisfy himself that the Contractor's statement appears to be correct. The Engineer shall then inform the City and, when applicable, regulatory agencies that the work is, in

his opinion, complete in apparent conformity with these Contract Documents and shall schedule the final inspection.

- B. Should the Engineer consider that the work is not finally complete, he will notify the Contractor in writing, stating reasons for his determination. The Contractor shall take immediate steps to remedy the stated deficiencies and/or conditions and, after correction of the deficiencies and/or conditions, send another written notice to the Engineer certifying that the work is complete. The Engineer, in company with the City, will re-inspect the work.
- C. After the final inspection and after the submission by the Contractor items required by these Contract Documents, the Engineer shall notify the City in writing that he has examined the work and that, in his opinion, it appears to conform to these Contract Documents and therefore recommends acceptance of the work and final payment to the Contractor. It is understood and agreed that such statement by the Engineer does not in any way relieve the Contractor or his Sureties from any duties, responsibilities, and obligations under these Contract Documents.
- D. After the Engineer recommends acceptance of the work covered by these Contract Documents and final payment to the Contractor, the City will, if it concurs in the Engineer's recommendation, promptly notify the Contractor in writing that the work is accepted. If the City does not concur in the Engineer's recommendation, the City will promptly notify the Contractor in writing that it does not accept the work as complete and stating the deficiencies and/or conditions that shall be corrected or resolved before final acceptance will be made. After the deficiencies and/or conditions are corrected or resolved and the City is satisfied that the work is complete, the City will notify the Contractor in writing that the work is considered complete and final acceptance is made. The guarantee period(s), as specified in these Contract Documents, shall begin on the date the Contractor is notified by the City that final acceptance of the work is made. Final acceptance of the work by the City will not be made until the Project Record Documents, operation and maintenance data and other required items are acceptable to the City.
- E. It is understood and agreed that said notice of final acceptance or final payment by the City shall not in any way be construed to relieve the Contractor, or his Sureties from any duties, responsibilities or obligations under or in connection with these Contract Documents.

14.07 *Final Payment*

A. Application for Payment:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments. Under no circumstances will Contractor's application for final payment be accepted by the Engineer until all Work required by the Contract Documents has been completed.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:

- a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment, if requested by the Engineer;
 - c. a list of all Claims against Owner that Contractor believes are unsettled;
 - d. an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work have been paid or otherwise satisfied;
 - e. the final Change Request Form signed by the Contractor to close the Contract;
 - f. certificate of occupancy issued by City of Chattanooga Inspection Department, if buildings are a part of the Project;
 - g. copy of Notice of Completion which had been filed with the appropriate office at the Hamilton County Tennessee Courthouse; and
 - h. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work, if requested by the Engineer.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying all documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, ~~within ten days after receipt of the final Application for Payment,~~ indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. ~~At the same time Thereupon~~ Engineer will ~~also~~ give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment. If the Application for Payment and accompanying documentation are appropriate as to form and substance, Owner will in accordance with the applicable State or local General Law, pay Contractor the amount recommended by Engineer.

C. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
 2. a waiver of all Claims by Contractor against Owner ~~other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.~~

14.10 Labor and Material

- A. Contractor shall indemnify and save Owner harmless from all claims growing out of the lawful demands for payment by subcontractors, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this Contract. Contractor shall, at Owner's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If Contractor fails to do so, then Owner may, after having served written notice on the said Contractor either pay unpaid bills, of which Owner has written notice, direct, or withhold from Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to Contractor shall be resumed, in accordance with the terms

of this Contract, but in no event shall the provisions of this sentence be construed to impose any obligations upon Owner to either Contractor or to Contractor's Surety. In paying any unpaid bills of Contractor, Owner shall be deemed the agent of Contractor and any payment so made by Owner shall be considered as payment made under the Contract by Owner to Contractor and Owner shall not be liable to Contractor for any such payment made in good faith.

14.11 Scope of Payment

A. The Contractor shall accept compensation provided in these Contract Documents as full payment for furnishing all labor, materials, supplies, tools, equipment, taxes, fees, contingencies, and other items necessary or convenient to the completed work and for performing all work contemplated and embraced in these Contract Documents; also for loss or damage arising from the nature of the work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the acceptance by the City and for all risks of every description connected with the prosecution of the work; also for all expenses incurred in consequence of the suspension or discontinuance of the work as provided in these Contract Documents; and for completing the work in accordance with these Contract Documents. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of any obligation to make good any defective work or material or of any provisions of these Contract Documents.

B. No compensation will be made in any case for loss of anticipated profits.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 Owner May Suspend Work

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor ~~shall~~may be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

B. The City shall have the authority to suspend the work wholly or in part, for such period as may be necessary, due to unsuitable weather, such other conditions as are considered unfavorable for the suitable prosecution of the work; or due to the failure on the part of the Contractor to carry out orders given, supply sufficient skilled workmen, supply suitable material, prosecute the work satisfactorily and in a workmanlike manner, make prompt payments to Subcontractors or for labor, materials, or equipment, or to perform any obligations or requirements of these Contract Documents. The Contractor shall immediately comply with the written order of the City to suspend the work wholly or in part. The suspended work shall be resumed when conditions are favorable and methods are corrected, as ordered or approved in writing by the City.

C. In the event that a suspension of the work is ordered by the City under Paragraph B above, the Contractor shall, at his expense, do all the work necessary to secure the work and the area affected by the work and to protect all previously completed work as specified herein or as

directed by the City. The suspension of the work by the City shall not relieve the Contractor of any duties, obligations, or responsibilities set forth in these Contract Documents. In the event the Contractor fails to secure and protect the work and area as specified or as ordered, the City will perform, or cause to be performed, all work considered necessary, and the cost thereof will be deducted from monies due or to become due the Contractor under the terms of these Contract Documents.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
3. Contractor's repeated disregard of the authority of Engineer; ~~or~~
4. Contractor's violation in any substantial way of any provisions of the Contract Documents;
5. If Contractor abandons the Work, or sublets this Contract or any part thereof, without the previous written consent of Owner, or if the Contract or any claim thereunder shall be assigned by Contractor otherwise than as herein specified;
6. Contractor is adjudged bankrupt or insolvent;
7. Contractor makes a general assignment for the benefit of creditors;
8. A trustee or receiver is appointed for Contractor or for any of Contractor's property;
9. Contractor files a petition to take advantage of any debtor's relief act, or to reorganize under the bankruptcy or applicable laws;
10. Contractor repeatedly fails to make prompt payments to subcontractors or material suppliers for labor, materials or equipment, or
11. The payment of any compensation, irrespective of its character or form, or the giving of any gratuity, or the granting of any valuable favor, directly or indirectly, by the Contractor to any authorized representative of the City or Engineer.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor, unless Contractor otherwise cures the deficiency in accordance with Paragraph 15.02.D.:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the

full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

~~F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.~~

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate or discontinue, in whole or in part, the Contract. In such case, Contractor shall be paid for (without duplication of any items):
1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, ~~including fair and reasonable sums for overhead and profit on such Work;~~
 2. direct expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, ~~plus fair and reasonable sums for overhead and profit on such expenses;~~

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; ~~and~~
 4. reasonable expenses directly attributable to termination; and-
 5. ten percent overhead and profit for those costs agreed to in Paragraphs 15.03.A.1 through 15.03.A.4 above.
- B. Contractor shall submit within 30 calendar days after receipt of notice of termination a written statement setting forth its proposal for an adjustment to the Contract Price to include only the incurred costs described in this clause. Owner shall review, analyze, and verify such proposal and negotiate an equitable amount and the Contract may be modified accordingly.
- C. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 Contractor May Stop Work or Terminate

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.
- C. Except as allowed in Paragraph A above, the Contractor shall not suspend the work and shall not remove any equipment, tools, supplies, materials, or other items without the written permission of the City.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 Methods and Procedures

- A. ~~Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration~~

~~Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.~~

~~B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.~~

~~C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:~~

- ~~1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or~~
- ~~2. agrees with the other party to submit the Claim to another dispute resolution process; or~~
- ~~3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.~~

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
2. delivered at or sent by registered or certified mail, postage prepaid, or by facsimile transmission and followed by written confirmation, to the last business address known to the giver of the notice.

B. All notices required of Contractor shall be performed in writing to the appropriate entity.

C. Electronic mail and messages will not be recognized as a written notice.

D. If the Contractor does not notify the Owner in accordance with Paragraph 10.05 of the belief that a field order, work by other contractors or the Owner, or subsurface, latent, or unusual unknown conditions entitles the Contractor to a Change Order, no consideration for time or money will be given the Contractor.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

~~A. This Contract is to be governed by the law of the state in which the Project is located~~

A. Each and every provision of this Agreement shall be construed in accordance with and governed by Tennessee law. The parties acknowledge that this Contract is executed in Hamilton County, Tennessee and that the Contract is to be performed in Hamilton County, Tennessee. Each party hereby consents to the Hamilton Superior Court's sole jurisdiction over any dispute which arises as a result of the execution or performance of this Agreement, and each party hereby waives any and all objections to venue in the Hamilton Superior Court.

17.06 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

17.07 *Addresses*

A. Both the address given in the Bid form upon which this Agreement is founded, and Contractor's office at or near the site of the Work are hereby designated as places to either of which notices, letters, and other communications to Contractor shall be certified, mailed, or delivered. The delivering at the above named place, or depositing in a postpaid wrapper directed to the first-named place, in any post office box regularly maintained by the post office department, of any notice, letter or other communication to Contractor shall be deemed sufficient service thereof upon date of such delivery or mailing. The first-named address may be changed at any time by an instrument in writing, executed by Contractor, and delivered to and acknowledged by the Owner and Engineer. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other communication upon Contractor personally.

17.08 Forms and Record

- A. The form of all Submittals, notices, change orders and other documents permitted or required to be used or transmitted under the Contract Documents shall be determined by the Engineer.
- B. Contractor shall maintain throughout the term of the Contract, complete and accurate records of all Contractor's costs which relate to the work performed, including the extra work, under the terms of the Contract. The Owner, or its authorized representative, shall have the right at any reasonable time to examine and audit the original records.
- C. Records to be maintained and retained by Contractor shall include, but not be limited to:
1. Payroll records accounting for total time distribution of Contractor's employees working full or part time on the work;
 2. Cancelled payroll checks or signed receipts for payroll payments in cash;
 3. Invoices for purchases, receiving and issuing documents, and all other unit inventory records for Contractor's stores, stock, or capital items;
 4. Paid invoices and cancelled checks for materials purchase, subcontractors, and any other third parties' charges;
 5. Original estimate and change order estimate files and detailed worksheets;
 6. All project-related correspondence; and
 7. Subcontractor and supplier change order files (including detailed documentation covering negotiated settlements).
- D. Owner shall also have the right to audit: any other supporting evidence necessary to substantiate charges related to this agreement (both direct and indirect costs, including overhead allocations as they may apply to costs associated with this agreement); and any records necessary to permit evaluation and verification of Contractor compliance with contract requirements and compliance with provisions for pricing change orders, payments, or claims submitted by Contractor or any payees thereof. Contractor shall also be required to include the right to audit provision in the contracts (including those of a lump-sum nature) of all subcontractors, insurance agents, or any other business entity providing goods and services.

17.09 Assignment

- A. Contractor shall not assign, sell, transfer or otherwise dispose of the whole or any part of this Contract or any monies due or to become due hereunder without written consent of the Owner. In case Contractor assigns all or any part of any monies due or to become due under this Contract, the instrument of assignment shall 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 prior liens of all persons, firms and corporations for services rendered or materials supplied for the performance of the Work called for under this Contract.

17.10 Use of Work by City

- A. Prior to substantial completion, the City may use any completed or substantially completed portions of the work, provided that such use will not substantially affect the Contractor's rights and obligations under the contract. It is understood and agreed that said use shall not constitute an acceptance of any such portions of the work.
- B. The City, or another Contractor under contract to the City, shall have the right to enter the premises for the purpose of doing work not covered by these Contract Documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the work, or the restoration of any damaged work except such as may be caused by agents, employees, or other contractors of the City.

17.11 Inspection by Public Agencies

- A. Authorized representatives of the Environmental Protection Agency, Department of the Interior, Tennessee Department of Public Health, and other governmental agencies having jurisdiction over the work or any part thereof shall have access to the work and any records relevant to the prosecution and progress of the work. The Contractor shall provide proper facilities for such access and inspection.

17.12 Hindrances and Delays

- A. The Contractor expressly agrees that the construction period named in these Contract Documents includes allowance for all hindrances and delays incident to the work. It is understood and agreed that no claim shall be made by the Contractor for hindrances or delays from any cause during the progress of the work, except as provided otherwise under the terms of these Contract Documents.

17.13 Losses from Natural Causes

- A. It is understood and agreed that all loss or damage arising out of the nature of the work, or from the action of the elements, or from floods or overflows, or from ground water, or from seepage, or from any unusual obstruction or difficulty, or from any other natural or existing circumstance either known or unforeseen, which may be encountered in the prosecution of the work, shall be sustained and borne by the Contractor at his own cost and expense.

17.14 New Job Opportunities

- A. The Contractor shall, to the maximum extent practicable, follow hiring and employment practices that will insure the availability of new job opportunities for unemployed and underemployed persons. The Contractor shall insert, or cause to be inserted, a similar provision in each contract with Subcontractors or Suppliers.

17.15 No Waiver of Legal Rights

- A. Neither the inspection by the City or Engineer or any of their officials, employees, or agents, nor any order by the City or Engineer for payment of money, or any payment for, or acceptance of, the whole or any part of the work by the City or Engineer, nor any extension of time, nor any

possession taken by the City or its employees, shall operate as a waiver of any provision of these Contract Documents, or of any power herein reserved to the City, or any right to damages herein provided, nor shall any waiver of any breach in this Contract be held to be a waiver of any other or subsequent breach.

B. Any waiver of any provisions of these Contract Documents shall be specific, shall apply only to the specified item or matter concerned and shall not apply to other similar or dissimilar items or matters.

17.16 Sewage, Surface, Subsurface and Flood Flows

A. The Contractor shall furnish all necessary equipment, materials and labor, at his expense, for handling, passing and disposing of all sewage, seepage, surface, subsurface and flood flows encountered at any time during the prosecution of the work. It is understood and agreed that the Contractor shall bear all risks associated with said flows; shall indemnify the City and the Engineer from any liabilities resulting from said flows; and shall not make any claim for additional compensation for delays or damage resulting from said flows. The manner of providing for these flows shall be satisfactory to the Engineer and in conformance with all applicable laws and regulations.

17.17 Maintenance of Existing Traffic

A. Satisfactory facilities shall be provided by the Contractor for maintaining public access and travel, and every effort shall be made to reduce any necessary inconveniences to a minimum.

END OF SECTION

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC C-700 (2007 Edition, with City of Chattanooga Modifications 07-30-13). All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

The provisions in this Section of the Specifications shall govern in the event of any conflict between this Section and the General Conditions.

SC-1.01.A.3. Add the following language to the end of Paragraph 1.01.A.3:

The Application for Payment form to be used on this Project is as included as Section 00 62 76, as supported by additional documentation as may be requested by the Owner or Engineer.

SC-1.01.A.9. Add the following language to the end of Paragraph 1.01.A.9:

The Change Order form to be used on this Project is as included in these Contract Documents.

SC-4.02 *Subsurface and Physical Conditions*

SC-4.02 Add the following new paragraphs immediately after Paragraph 4.02.B:

- C. No reports of explorations and tests of subsurface conditions at or contiguous to the Site.

SC-4.06 *Hazardous Environmental Conditions*

SC-4.06 Delete Paragraphs 4.06.A and 4.06.B in their entirety and insert the following:

- A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.
- B. Not Used.

SC-5.03 *Certificates of Insurance*

SC-5.03, following Paragraph E, add the following,

- F. Copies of endorsements showing that each additional insured identified herein have been added to the policies as an additional insured shall be attached to each of the certificates.

Supplementary Conditions

- G. Each insurance certificate for all coverages other than Worker's Compensation Insurance must show that a waiver of rights of recovery against any of the insured or the additional insured is in effect.
- H. Certificate for Worker's Compensation and Employer's Liability coverage must indicate inclusion or exclusion for any proprietor, partner, executive officer or member.

SC-5.04 *Contractor's Insurance*

SC-5.04.B.1, There are no other additional insureds other than the Owner and Engineer.

SC-5.04.C, following Paragraph 5.04.B.6.b, Add,

- C. The limits of liability for the insurance required by paragraph 5.04.B.2 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:
 - 1. Worker's compensation, disability benefits and other similar employee benefit acts, and damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees as provided in Paragraphs 5.04.A.1 and 5.04.A.2 of the General Conditions:
 - a. Workers Compensation: Statutory limits
 - b. Employer's Liability, Each Accident: \$1,000,000
 - c. Employer's Liability, Each Employee: \$1,000,000
 - d. Employer's Liability, Disease – Policy Limit: \$1,000,000
 - 2. Contractor's General Liability Insurance under paragraphs 5.04.A.3 through 5.04.A.5 of the General Conditions shall provide the following minimum limits and conditions:
 - a. Each Occurrence: \$1,000,000.
 - b. Damage to Rented Premises (each occurrence) \$100,000.
 - c. Medical Expenses (any one person) \$5,000.
 - d. Personal and Advertising Injury: \$1,000,000.
 - e. General Aggregate: \$2,000,000.
 - f. Products-Completed Operations Aggregate: \$2,000,000.
 - g. Explosion, collapse, and underground coverage shall be included with such indicated on the insurance certificate under General Liability.
 - h. The general aggregate policy limits must be designated to the Project.

- i. Contractual Liability coverage, as required under Paragraph 5.04.B.3 must be indicated on the insurance certificate under General Liability.
3. Automobile Liability under Paragraph 5.04.A.6 of the General Conditions, providing for Combined Single Limit (each accident) for all owned, hired, and non-owned vehicles: \$1,000,000.
4. Provide Excess Liability or Umbrella Liability insurance providing protection for at least the hazards insured under the primary liability policies with the following limits:
 - a. General Aggregate: \$5,000,000.
 - b. Each Occurrence: \$5,000,000.

NTU: The following is a mandatory Supplementary Condition, for it specifies the rates to be charged against the Contractor's Work for Overtime inspection, by the Owner or Engineer, required in GC-6.02.D.

SC-6.02 *Labor; Working Hours*

SC-6.02 Add the following subparagraph 6.02.D.1:

1. The following rates will apply for the overtime work on behalf of the Owner: \$95.00/hour to \$120.00/hour, depending on actual Resident Project Representative assigned to the Project.

NTU: The following is not a mandatory Supplementary Condition. Delete if not applicable. GC-6.08 indicates that the any permits not required to be provided by the Contractor will be identified. If all permits are to be provided by the Contractor this SC6.08 is not required. Otherwise use the following:.

SC-6.08 *Permits*

SC-6.08 Add the following subparagraphs 6.08.B.1:

1. The Owner will provide the following Permits:
 - a. SWPPP/NOI
 - b. Land Disturbance Permit
 - c. General Aquatic Resource Alteration Permit (ARAP)

SC-6.13 *Safety and Protection*

SC-6.13 Delete the second sentence of Paragraph 6.13.C.

SC-9.03 *Project Representative*

SC-9.03 Add the following new paragraphs immediately after Paragraph 9.03.A:

- B. The Resident Project Representative (RPR) will be Engineer's employee or agent at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions. RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall be only through or with the full knowledge and approval of Contractor. The RPR shall:
1. *Schedules:* Review the progress schedule, schedule of Shop Drawing and Sample submittals, and schedule of values prepared by Contractor and consult with Engineer concerning acceptability.
 2. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other project-related meetings, and prepare and circulate copies of minutes thereof.
 3. *Liaison:*
 - a. Serve as Engineer's liaison with Contractor, working principally through Contractor's authorized representative, assist in providing information regarding the intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
 4. *Interpretation of Contract Documents:* Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
 5. *Shop Drawings and Samples:*
 - a. Record date of receipt of Samples and approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 6. *Modifications:* Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
 7. *Review of Work and Rejection of Defective Work.*

- a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress will not produce a completed Project that conforms generally to the Contract Documents or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
8. *Inspections, Tests, and System Startups:*
- a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
 - b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.
9. *Records:*
- a. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
 - b. Maintain records for use in preparing Project documentation.
10. *Reports:*
- a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the progress schedule and schedule of Shop Drawing and Sample submittals.
 - b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
 - c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition.

11. *Payment Requests:* Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the schedule of values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.
 12. *Certificates, Operation and Maintenance Manuals:* During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.
 13. *Completion:*
 - a. Participate in a Substantial Completion inspection, assist in the determination of Substantial Completion and the preparation of lists of items to be completed or corrected.
 - b. Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final list of items to be completed and deficiencies to be remedied.
 - c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the Notice of Acceptability of the Work.
- C. The RPR shall not:
1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
 3. Undertake any of the responsibilities of Contractor, Subcontractors, Suppliers, or Contractor's superintendent.
 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work unless such advice or directions are specifically required by the Contract Documents.
 5. Advise on, issue directions regarding, or assume control over safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

NTU: This is a mandatory Supplementary Condition. GC-14.02.D.4.a requires the stipulation of the hourly rate for additional Engineering Services to be charged against the Contractor for a variety of items.

SC-14.02.D.4.e After paragraph 14.02.D. 4.d, add the following:

5. The following rates will for the additional services performed by the Engineer on behalf of the Owner:

<u>Labor Grade</u>	<u>Rate</u>
E2	\$95.00
E4	\$110.00
E6	\$130.00
E8	\$175.00

END OF SECTION

Equal Employment Opportunities Specifications

Following is the standard language which must be incorporated into all solicitations for offers and bids on all construction contracts or subcontracts in excess of \$10,000 to be performed in designated geographical areas:

"Minority" includes:

- a. Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
- b. Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
- c. Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
- d. American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

END OF SECTION

Equal Employment Opportunity Clause

The City of Chattanooga is an equal opportunity employer and during the performance of this contract, the Contractor agrees to abide by the equal opportunity goals of the City of Chattanooga as follows:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
2. The Contractor will, 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, religion, sex, or national origin.
3. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
4. In all construction contracts or subcontracts in excess of \$10,000 to be performed for the City of Chattanooga, any Contractor and/or subcontractor is further required to file in duplicate within ten (10) days of being notified that it is the lowest responsible bidder, an affirmative action plan with the EEO Director of the City of Chattanooga. This plan shall state the Contractor's goals for minority and women utilization as a percentage of the work force on this Project.
5. This Plan or any attachments thereto shall further provide a list of employees annotated by job function, race and sex who are expected to be utilized on this Project. This plan or attachment thereto shall further describe the methods by which the Contractor or subcontractor will utilize to make good faith efforts at providing employment opportunities for minorities and women.
6. The Contractor will include the portion of the sentence immediately preceding Paragraph 1 and the provisions of Paragraphs 1 through 6 in every subcontract so that such provisions will be requested of each subcontractor. The Contractor agrees to notify the City of Chattanooga of any subcontractor who refuses or fails to comply with these equal opportunity provisions. Any failure or refusal to comply with these provisions by the Contractor and/or subcontractor shall be a breach of this contract.

END OF SECTION

Contract Name: _____

Contract Number: _____

New Retainage Escrow Account Set-up Form - Suntrust

(1) Legal Business Name:

(2) Business Address:

(3) TIN (Tax Identification No):

(4) Contact Name:

Telephone:

Email:

(5) Authorized Signer's Name & Title for Retainage Account:

(6) Owner's Names with Titles and Percentages:

(7) Please provide a copy of the following document that applies:

Corporation Articles of Incorporation

LLC Operating Agreement & Articles of Organization

Partnership Partnership Agreement

ESCROW AGREEMENT

THIS ESCROW AGREEMENT (this "Escrow Agreement") is entered into and effective this _____ day of _____, 2020, by and among City of Chattanooga ("Owner") and _____ [name and legal status] ("Contractor" and together with Owner, the "Parties", and individually, a "Party") and SunTrust Bank, a Georgia banking corporation, as escrow agent ("Escrow Agent").

WHEREAS, Owner and Contractor entered into a construction contract dated _____ (the "Contract"). The Contract provides that _____ percent (____%) of progress payments made under the Contract will be withheld as retainage ("Retainage") from the total of progress payments made by Owner to Contractor ;and

WHEREAS, pursuant to T.C.A. § 66-34-104 (the "Statute"), the amount withheld as Retainage is to be deposited in a separate escrow account maintained with a third party and invested as set forth in Section 4.2 below; and

WHEREAS, Owner and Contractor desire that all Retainage withheld under the Contract be deposited into an interest bearing escrow account pursuant to and in compliance with the Statute; and

WHEREAS, the Parties desire for the Escrow Agent to open an account (the "Escrow Account") into which Owner will deposit funds to be held, disbursed and invested by the Escrow Agent in accordance with this Escrow Agreement; and

WHEREAS, the Parties acknowledge that the Escrow Agent is not a party to, and has no duties or obligations under, the Contract, that all references in this Escrow Agreement to the Contract are for convenience only, and that the Escrow Agent shall have no implied duties beyond the express duties set forth in this Escrow Agreement.

NOW, THEREFORE, in consideration of the premises herein, the Parties and the Escrow Agent agree as follows:

I. Terms and Conditions

1.1. The Parties hereby appoint the Escrow Agent as their escrow agent for the purposes set forth herein, and the Escrow Agent hereby accepts such appointment under the terms and conditions set forth herein.

1.2. Owner shall remit \$_____ (the "Escrow Fund") to the Escrow Agent, using the wire instructions below, to be held by the Escrow Agent and invested and disbursed as provided in this Escrow Agreement. The percentage of payments withheld as Retainage may not exceed 5% of the amount of the construction contract. T.C.A. § 66-34-103(a).

SunTrust Bank
ABA: 061000104
Account: 9443001321
Account Name: Escrow Services
Reference: _____
Attention: _____

1.3. Within two Business Days after receipt of joint written instructions and signed by an authorized representative of the each of the Parties set forth on such Party's Certificate of Incumbency provided to the Escrow Agent pursuant to Section 4.13, the Escrow Agent shall disburse funds as provided in such joint written instructions, but only to the extent that funds are collected and available. For purposes of this Escrow Agreement, "Business Day" shall mean any day other than a Saturday, Sunday or any other day on which the Escrow Agent located at the notice address set forth in Section 4.5 is authorized or required by law or executive order to remain closed.

II. Provisions as to Escrow Agent

2.1. This Escrow Agreement expressly and exclusively sets forth the duties of the Escrow Agent with respect to any and all matters pertinent hereto, which duties shall be deemed purely ministerial in nature, and no implied duties or obligations shall be read into this Escrow Agreement against the Escrow Agent. The Escrow Agent shall in no event be deemed to be a fiduciary to any Party or any other person or entity under this Escrow Agreement. The permissive rights of the Escrow Agent to do things enumerated in this Escrow Agreement shall not be construed as duties. In performing its duties under this Escrow Agreement, or upon the claimed failure to perform its duties, the Escrow Agent shall not be liable for any damages, losses or expenses other than damages, losses or expenses which have been finally adjudicated by a court of competent jurisdiction to have directly resulted from the Escrow Agent's gross negligence or willful misconduct. In no event shall the Escrow Agent be liable for incidental, indirect, special, consequential or punitive damages of any kind whatsoever (including but not limited to lost profits), even if the Escrow Agent has been advised of the likelihood of such loss or damage and regardless of the form of action. The Escrow Agent shall not be responsible or liable for the failure of any Party to take any action in accordance with this Escrow Agreement. Any wire transfers of funds made by the Escrow Agent pursuant to this Escrow Agreement will be made subject to and in accordance with the Escrow Agent's usual and ordinary wire transfer procedures in effect from time to time. The Escrow Agent shall have no liability with respect to the transfer or distribution of any funds affected by the Escrow Agent pursuant to wiring or transfer instructions provided to the Escrow Agent in accordance with the provisions of this Escrow Agreement. The Escrow Agent shall not be obligated to take any legal action or to commence any proceedings in connection with this Escrow Agreement or any property held hereunder or to appear in, prosecute or defend in any such legal action or proceedings. 2. The Parties acknowledge and agree that the Escrow Agent acts hereunder as a depository only, and is not responsible or liable in any manner whatsoever for the sufficiency, correctness, genuineness or validity of the subject matter of this Escrow Agreement or any part thereof, or of any person executing or depositing such subject matter. No provision of this Escrow Agreement shall require the Escrow Agent to risk or advance its own funds or otherwise incur any financial liability or potential financial liability in the performance of its duties or the exercise of its rights under this Escrow Agreement.

2.3. This Escrow Agreement constitutes the entire agreement between the Escrow Agent and the Parties in connection with the subject matter of this Escrow Agreement, and no other agreement entered into between the Parties, or any of them, including, without limitation, the Contract, shall be considered as adopted or binding, in whole or in part, upon the Escrow Agent notwithstanding that any such other agreement may be deposited with the Escrow Agent or the Escrow Agent may have knowledge thereof.

2.4. The Escrow Agent shall in no way be responsible for nor shall it be its duty to notify any Party or any other person or entity interested in this Escrow Agreement of any payment required or maturity occurring under this Escrow Agreement or under the terms of any instrument deposited herewith unless such notice is explicitly provided for in this Escrow Agreement.

2.5. The Escrow Agent shall be protected in acting upon any written instruction, notice, request, waiver, consent, certificate, receipt, authorization, power of attorney or other paper or document which the Escrow Agent in good faith believes to be genuine and what it purports to be, including, but not limited to, items directing investment or non-investment of funds, items requesting or authorizing release, disbursement or retainage of the subject matter of this Escrow Agreement and items amending the terms of this Escrow Agreement. The Escrow Agent shall be under no duty or obligation to inquire into or investigate the validity, accuracy or content of any such notice, request, waiver, consent, certificate, receipt, authorization, power of attorney or other paper or document. The Escrow Agent shall have no duty or obligation to make any formulaic calculations of any kind hereunder. Notwithstanding the foregoing, Escrow Agent shall be responsible for disbursing funds in accordance with joint written instructions from the Parties as set forth in Sections 1.3 and 4.13.

2.6. The Escrow Agent may execute any of its powers and perform any of its duties hereunder directly or through affiliates or agents. The Escrow Agent shall be entitled to seek the advice of legal counsel with respect to any matter arising under this Escrow Agreement and the Escrow Agent shall have no liability and shall be fully protected with respect to any action taken or omitted pursuant to the advice of such legal counsel. The Parties shall be jointly and severally liable for and shall promptly

pay upon demand by the Escrow Agent the reasonable and documented fees and expenses of any such legal counsel.

2.7. In the event of any disagreement between any of the Parties, or between any of them and any other person or entity, resulting in adverse claims or demands being made in connection with the matters covered by this Escrow Agreement, or in the event that the Escrow Agent, in good faith, is in doubt as to what action it should take hereunder, the Escrow Agent may, at its option, refuse to comply with any claims or demands on it, or refuse to take any other action hereunder, so long as such disagreement continues or such doubt exists, and in any such event, the Escrow Agent shall not be or become liable in any way or to any Party or other person or entity for its failure or refusal to act, and the Escrow Agent shall be entitled to continue to refrain from acting until (i) the rights of the Parties and all other interested persons and entities shall have been fully and finally adjudicated by a court of competent jurisdiction, or (ii) all differences shall have been settled and all doubt resolved by agreement among all of the Parties and all other interested persons and entities, and the Escrow Agent shall have been notified thereof in writing signed by the Parties and all such persons and entities. Notwithstanding the preceding, the Escrow Agent may in its discretion obey the order, judgment, decree or levy of any court, whether with or without jurisdiction, or of an agency of the United States or any political subdivision thereof, or of any agency of any State of the United States or of any political subdivision of any thereof, and the Escrow Agent is hereby authorized in its sole discretion to comply with and obey any such orders, judgments, decrees or levies. The rights of the Escrow Agent under this sub-paragraph are cumulative of all other rights which it may have by law or otherwise.

In the event of any disagreement or doubt, as described above, the Escrow Agent shall have the right, in addition to the rights described above and at the election of the Escrow Agent, to tender into the registry or custody of any court having jurisdiction, all funds and property held under this Escrow Agreement, and the Escrow Agent shall have the right to take such other legal action as may be appropriate or necessary, in the sole discretion of the Escrow Agent. Upon such tender, the Parties agree that the Escrow Agent shall be discharged from all further duties under this Escrow Agreement; provided, however, that any such action of the Escrow Agent shall not deprive the Escrow Agent of its compensation and right to reimbursement of expenses hereunder arising prior to such action and discharge of the Escrow Agent of its duties hereunder.

2.8. The Contractor agrees to indemnify, defend and hold harmless the Escrow Agent and each of the Escrow Agent's officers, directors, agents and employees (the "Indemnified Parties") from and against any and all losses, liabilities, claims made by any Party or any other person or entity, damages, expenses and costs (including, without limitation, attorneys' fees and expenses) of every nature whatsoever (collectively, "Losses") which any such Indemnified Party may incur and which arise directly or indirectly from this Escrow Agreement or which arise directly or indirectly by virtue of the Escrow Agent's undertaking to serve as Escrow Agent hereunder; provided, however, that no Indemnified Party shall be entitled to indemnity with respect to Losses that have been finally adjudicated by a court of competent jurisdiction to have been directly caused by such Indemnified Party's gross negligence or willful misconduct. The provisions of this section shall survive the termination of this Escrow Agreement and any resignation or removal of the Escrow Agent.

2.9. Any entity into which the Escrow Agent may be merged or converted or with which it may be consolidated, or any entity to which all or substantially all the escrow business of the Escrow Agent may be transferred, shall be the Escrow Agent under this Escrow Agreement without further act.

2.10. The Escrow Agent may resign at any time from its obligations under this Escrow Agreement by providing written notice to the Parties. Such resignation shall be effective on the date set forth in such written notice, which shall be no earlier than thirty (30) days after such written notice has been furnished. In such event, the Parties shall promptly appoint a successor escrow agent. In the event no successor escrow agent has been appointed on or prior to the date such resignation is to become effective, the Escrow Agent shall be entitled to tender into the custody of any court of competent jurisdiction all funds and other property then held by the Escrow Agent hereunder and the Escrow Agent shall thereupon be relieved of all further duties and obligations under this Escrow Agreement; provided, however, that any such action of the Escrow Agent shall not deprive the Escrow Agent of its compensation and right to reimbursement of expenses hereunder arising prior to such action and

discharge of the Escrow Agent of its duties hereunder. The Escrow Agent shall have no responsibility for the appointment of a successor escrow agent hereunder.

2.11 The Escrow Agent and any director, officer or employee of the Escrow Agent may become financially interested in any transaction in which any of the Parties may be interested and may contract with and lend money to any Party and otherwise act as fully and freely as though it were not escrow agent under this Escrow Agreement. Nothing herein shall preclude the Escrow Agent from acting in any other capacity for any Party.

III. Compensation of Escrow Agent

Escrow Agent waives all legal and administrative fees as shown in **Exhibit B** Schedule of Fees and Expenses. However, in the event that the conditions for the disbursement of funds are not fulfilled, or the Escrow Agent renders any service not contemplated in this Escrow Agreement, or there is any assignment of interest in the subject matter of this Escrow Agreement or any material modification hereof, or if any dispute or controversy arises hereunder, or the Escrow Agent is made a party to any litigation pertaining to this Escrow Agreement or the subject matter hereof, then the Contractor agrees to compensate the Escrow Agent for such extraordinary services and reimburse the Escrow Agent for all costs and expenses, including reasonable attorneys' fees and expenses, occasioned by any such event.

IV. Miscellaneous

4.1. The Escrow Agent shall make no disbursement, investment or other use of funds until and unless it has collected funds. The Escrow Agent shall not be liable for collection items until the proceeds of the same in actual cash have been received or the Federal Reserve has given the Escrow Agent credit for the funds.

4.2. The Escrow Agent shall invest all funds held pursuant to this Escrow Agreement in the SunTrust Institutional Deposit Option 75. The investments in the SunTrust Institutional Deposit Option 75 are insured, subject to the applicable rules and regulations of the Federal Deposit Insurance Corporation (the "FDIC"), in the standard FDIC insurance amount of \$250,000, including principal and accrued interest, and are not secured. The SunTrust Institutional Deposit Option 75 is more fully described in materials which have been furnished to the Parties by the Escrow Agent, and the Parties acknowledge receipt of such materials from the Escrow Agent. Instructions to make any other investment must be in writing and signed by each of the Parties. The Parties recognize and agree that the Escrow Agent will not provide supervision, recommendations or advice relating to the investment of moneys held hereunder or the purchase, sale, retention or other disposition of any investment, and the Escrow Agent shall not be liable to any Party or any other person or entity for any loss incurred in connection with any such investment. The Escrow Agent is hereby authorized to execute purchases and sales of investments through the facilities of its own trading or capital markets operations or those of any affiliated entity. The Escrow Agent or any of its affiliates may receive compensation with respect to any investment directed hereunder including without limitation charging any applicable agency fee in connection with each transaction. The Escrow Agent shall use its best efforts to invest funds on a timely basis upon receipt of such funds; provided, however, that the Escrow Agent shall in no event be liable for compensation to any Party or other person or entity related to funds which are held un-invested or funds which are not invested timely. The Escrow Agent is authorized and directed to sell or redeem any investments as it deems necessary to make any payments or distributions required under this Escrow Agreement. Any investment earnings and income on the Escrow Fund shall become part of the Escrow Fund and shall be disbursed in accordance with this Escrow Agreement.

4.3 The Escrow Agent shall provide monthly reports of transactions and holdings to the Parties as of the end of each month, at the addresses provided by the Parties in Section 4.5.

4.4 The Parties agree that all interest and income from the investment of the funds shall be reported as having been earned by Contractor as of the end of each calendar year whether or not such income was disbursed during such calendar year and to the extent required by the Internal Revenue Service. On or before the execution and delivery of this Escrow Agreement, each of the Parties shall provide to the Escrow Agent a correct, duly completed, dated and executed current United States Internal Revenue Service Form W-9 or Form W-8, whichever is appropriate or any successor forms thereto,

in a form and substance satisfactory to the Escrow Agent including appropriate supporting documentation and/or any other form, document, and/or certificate required or reasonably requested by the Escrow Agent to validate the form provided. Notwithstanding anything to the contrary herein provided, except for the delivery and filing of tax information reporting forms required pursuant to the Internal Revenue Code of 1986, as amended, to be delivered and filed with the Internal Revenue Service by the Escrow Agent, as escrow agent hereunder, the Escrow Agent shall have no duty to prepare or file any Federal or state tax report or return with respect to any funds held pursuant to this Escrow Agreement or any income earned thereon. With respect to the preparation, delivery and filing of such required tax information reporting forms and all matters pertaining to the reporting of earnings on funds held under this Escrow Agreement, the Escrow Agent shall be entitled to request and receive written instructions from Contractor, and the Escrow Agent shall be entitled to rely conclusively and without further inquiry on such written instructions. The Contractor agrees to indemnify, defend and hold the Escrow Agent harmless from and against any tax, late payment, interest, penalty or other cost or expense that may be assessed against the Escrow Agent on or with respect to the Escrow Fund or any earnings or interest thereon unless such tax, late payment, interest, penalty or other cost or expense was finally adjudicated by a court of competent jurisdiction to have been directly caused by the gross negligence or willful misconduct of the Escrow Agent. The indemnification provided in this section is in addition to the indemnification provided to the Escrow Agent elsewhere in this Escrow Agreement and shall survive the resignation or removal of the Escrow Agent and the termination of this Escrow Agreement.

4.5. Any notice, request for consent, report, or any other communication required or permitted in this Escrow Agreement shall be in writing and shall be deemed to have been given when delivered (i) personally, (ii) by facsimile transmission with written confirmation of receipt, (iii) by electronic mail to the e-mail address given below, and written confirmation of receipt is obtained promptly after completion of the transmission, (iv) by overnight delivery with a reputable national overnight delivery service, or (v) by United States mail, postage prepaid, or by certified mail, return receipt requested and postage prepaid, in each case to the appropriate address set forth below or at such other address as any party hereto may have furnished to the other parties hereto in writing:

If to Escrow Agent:

SunTrust Bank
Attn: Escrow Services
919 East Main Street, 5th Floor
Richmond, Virginia 23219
Client Manager: Nickida Dooley
Phone: 804-782-7610
Facsimile: 804-225-7141
Email: nickida.dooley@suntrust.com

If to City:

City of Chattanooga
Attention: Finance Department
101 E. 11th Street
Chattanooga, TN 37402

If to Contractor:

Phone: _____
Facsimile: _____
E-mail: _____
Tax identification #: _____

Any party hereto may unilaterally designate a different address by giving notice of each change in the manner specified above to each other party hereto. Notwithstanding anything to the contrary herein provided, the Escrow Agent shall not be deemed to have received any notice, request, report or other communication hereunder prior to the Escrow Agent's actual receipt thereof.

4.6. This Escrow Agreement is being made in and is intended to be construed according to the laws of the State of Tennessee. Except as permitted in Section 2.9, neither this Escrow Agreement nor any rights or obligations hereunder may be assigned by any party hereto without the express written consent of each of the other parties hereto. This Escrow Agreement shall inure to and be binding upon the Parties and the Escrow Agent and their respective successors, heirs and permitted assigns.

4.7. The terms of this Escrow Agreement may be altered, amended, modified or revoked only by an instrument in writing signed by all the Parties and the Escrow Agent.

4.8. This Escrow Agreement is for the sole benefit of the Indemnified Parties, the Parties and the Escrow Agent, and their respective successors and permitted assigns, and nothing herein, express or implied, is intended to or shall confer upon any other person or entity any legal or equitable right, benefit or remedy of any nature whatsoever under or by reason of this Escrow Agreement.

4.9. No party to this Escrow Agreement shall be liable to any other party hereto for losses due to, or if it is unable to perform its obligations under the terms of this Escrow Agreement because of, acts of God, fire, war, terrorism, floods, strikes, electrical outages, equipment or transmission failure, or other causes reasonably beyond its control.

4.10 This Escrow Agreement shall terminate on the first to occur of (i) the date on which all of the funds and property held by the Escrow Agent under this Escrow Agreement have been disbursed or (ii) _____, 20__ at which time the Escrow Agent is authorized and directed to disburse all of the remaining funds and property held hereunder in accordance with the joint written instructions of the Parties. Upon the termination of this Escrow Agreement and the disbursement of all of the funds and property held hereunder, this Escrow Agreement shall be of no further effect except that the provisions of Sections 2.8, 3.1 and 4.4 shall survive such termination.

4.11. All titles and headings in this Escrow Agreement are intended solely for convenience of reference and shall in no way limit or otherwise affect the interpretation of any of the provisions hereof.

4.12. This Escrow Agreement may be executed in one or more counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

4.13. Contemporaneously with the execution and delivery of this Escrow Agreement and, if necessary, from time to time thereafter, each of the Parties shall execute and deliver to the Escrow Agent a Certificate of Incumbency substantially in the form of Exhibit A-1 and A-2 hereto, as applicable (a "Certificate of Incumbency"), for the purpose of establishing the identity and authority of persons entitled to issue notices, instructions or directions to the Escrow Agent on behalf of each such party. Until such time as the Escrow Agent shall receive an amended Certificate of Incumbency replacing any Certificate of Incumbency theretofore delivered to the Escrow Agent, the Escrow Agent shall be fully protected in relying, without further inquiry, on the most recent Certificate of Incumbency furnished to the Escrow Agent. Whenever this Escrow Agreement provides for joint written notices, joint written instructions or other joint actions to be delivered to the Escrow Agent, the Escrow Agent shall be fully protected in relying, without further inquiry, on any joint written notice, instructions or action executed by persons named in such Certificate of Incumbency.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed as of the date first above written.

SunTrust Bank, as Escrow Agent

By: _____

Name: _____

Title: _____

City of Chattanooga

By: _____

Name: _____

Title: _____

By: _____

Name: _____

Title: _____

EXHIBIT A-1

**Certificate of Incumbency
(List of Authorized Representatives)**

Client Name: City of Chattanooga

As an Authorized Officer of the above referenced entity, I hereby certify that each person listed below is an authorized signor for such entity, and that the title and signature appearing beside each name is true and correct.

<u>Name</u>	<u>Title</u>	<u>Signature</u>	<u>Phone Number</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

IN WITNESS WHEREOF, this certificate has been executed by a duly authorized officer on:

Date

By: _____

Name: _____

Its: _____

EXHIBIT A-2

**Certificate of Incumbency
(List of Authorized Representatives)**

Client Name: _____

As an Authorized Officer of the above referenced entity, I hereby certify that each person listed below is an authorized signor for such entity, and that the title and signature appearing beside each name is true and correct.

<u>Name</u>	<u>Title</u>	<u>Signature</u>	<u>Phone Number</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

IN WITNESS WHEREOF, this certificate has been executed by a duly authorized officer on:

Date

By: _____

Name: _____

Its: _____

EXHIBIT B

SunTrust Bank, as Escrow Agent

Schedule of Fees & Expenses

**EXHIBIT C
RELEASE**

The undersigned, _____, as the Owner pursuant to a Construction Contract with _____ ("Contractor") dated _____ (the "Contract") hereby certifies that Contractor fully and completely finished all work required of Contractor pursuant to such Contract, except work which may be required pursuant to any guaranty or warranty contained in such Contract, and the undersigned hereby authorizes SunTrust Bank ("Bank") to release _____ (\$ _____) paid as retainage pursuant to that certain Escrow Agreement between and among the undersigned, _____, ("Owner"), Contractor, and Bank, and dated the ____ day of _____, 20____, which agreement is specifically incorporated herein by reference. This release is executed for the sole purpose of releasing the amounts held in escrow as aforesaid and specifically does not, and shall not, be construed to release or otherwise affect any claims or rights which Owner/Borrower has or may have against Contractor pursuant to said contract or the work performed thereunder.

[Insert Check/Wiring Instructions]

Attest:

OWNER:

Secretary

By:

Title: _____

STATE OF _____
COUNTY OF _____

Affiant makes oath that the above is true, as sworn before me, a Notary Public, this ____ day of _____, 20__.

Notary Public

(SEAL)

My Commission Expires _____

APPROVED BY CONTRACTOR:

By: _____

Title: _____

Reference Contract # _____

Contract Name: _____

CORPORATE RESOLUTION

BE IT RESOLVED, that _____, a Tennessee Corporation, hereby authorized and empowers the following Officers:

to make, execute and deliver, in behalf of the corporation, unto the CITY OF CHATTANOOGA ("CITY"), its ATTORNEY-IN-FACT, with full power and authority to substitute certain retained funds for securities and take custody of and negotiate said securities at any time and to any extent necessary to cause the contract to be fulfilled. Pursuant to Tenn. Code Ann. § 12-4-108, SUNTRUST BANK shall oversee the safekeeping, custodial care and servicing of securities to the extent necessary to effectuate the purposes of the applicable state law.

BE IT ALSO RESOLVED, that the foregoing resolutions and the authority granted the individuals herein named, shall continue until canceled by delivery to and receipt by CITY, of written notice by a duly authorized representative of the corporation canceling any or all of the foregoing resolutions.

IN WITNESS WHEREOF, I have executed my name as Secretary this _____ day of _____, _____.

BY: _____

TITLE: _____

Reference Contract # _____

Contract Name: _____

LIMITED POWER OF ATTORNEY

Be it known that the undersigned CONTRACTOR _____
of the County of _____, State of _____
_____ hereby makes and appoints the CITY of CHATTANOOGA
("CITY") its true and lawful attorney for specific and limited purposes necessary to empower
CITY to substitute certain retained funds for securities consistent with Tenn. Code Ann. § 12-4-
108(c) and take custody of the securities and to negotiate said securities at any time and to any
extent necessary to cause the contract to be fulfilled in accordance with its provisions.

CITY shall purchase said securities issued by SUNTRUST BANK consistent with CITY's
power to enter into a trust agreement with said bank as set forth in Tenn. Code Ann. § 12-4-108(i).

CITY shall perform all acts under this Limited Power of Attorney consistent with the
requirements set forth in Tenn. Code Ann. § 12-4-108.

This Limited Power of Attorney is effective upon execution and shall remain in effect until
such time of completion of the contract and satisfaction of any statutory obligations with respect
thereto.

Signed this _____ day of _____, _____

Signature _____

Title _____

Certification Regarding Beneficial Owner(s) and Controlling Person of Legal Entity Customers

I. GENERAL INSTRUCTIONS

What is this form?

To help the government fight financial crime, federal regulation requires certain financial institutions to obtain, verify, and record information about the beneficial owners of legal entity customers. Legal entities can be abused to disguise involvement in terrorist financing, money laundering, tax evasion, corruption, fraud, and other financial crimes. Requiring the disclosure of key individuals who ultimately own or control a legal entity (i.e., the beneficial owners) helps law enforcement investigate and prosecute these crimes.

Who has to complete this form?

This form must be completed by the Certifying Person - the person opening a new account or otherwise fulfilling the bank's request to provide this Beneficial Ownership related information - on behalf of a legal entity with any of the following U.S. financial institutions: (i) a bank or credit union; (ii) a broker or dealer in securities; (iii) a mutual fund; (iv) a futures commission merchant; or (v) an introducing broker in commodities. For the purposes of this form, a legal entity includes a corporation, limited liability company, or other entity that is created by a filing of a public document with a Secretary of State or similar office, a general partnership, and any similar business entity formed in the United States or a foreign country. Legal entity does not include sole proprietorships, unincorporated associations, or natural persons opening accounts on their own behalf.

What information do I have to provide?

This form requires you to provide the name, address, date of birth and Social Security number (or passport number or other similar information, in the case of non-U.S. persons) for the following individuals:

- i. **Beneficial Owner** - Each individual who owns, directly or indirectly, through any contract, arrangement, understanding relationship or otherwise, 25 percent or more of the equity interests of the legal entity customer (e.g., shares of a corporation). In some cases, the bank may request a lower ownership percentage (e.g. 10 percent ownership); and
- ii. **Controlling Person** - An individual with significant responsibility for managing the legal entity customer (e.g., a Chief Executive Officer, Chief Financial Officer, Chief Operating Officer, Managing Member, General Partner, President, Vice President, or Treasurer)

The number of individuals that satisfy this definition of "beneficial owner" may vary. Under section (D), depending on the factual circumstances, up to ten individuals (but as few as zero) may need to be identified. Regardless of the number of individuals identified under section (D), you must provide the identifying information of one individual under section (E). It is possible that in some circumstances the same individual might be identified under both sections (e.g., the President of Acme, Inc. who also holds a 30% equity interest). Thus, a completed form will contain the identifying information of at least one individual (under section (E)), and up to eleven individuals (i.e., one individual under section (E) and ten 10 percent equity holders under section (D)).

We will also ask to see and/or obtain a copy of a driver's license or other identifying document for each beneficial owner and controlling person listed on this form.

In certifying the information below, the Certifying Person also agrees to ensure that the legal entity for which it provides this information notifies us of any changes in such information.

II. CERTIFICATION OF BENEFICIAL OWNER(S) & CONTROLLING PERSON

Person certifying this form on behalf of a legal entity must provide the following information:

A. PERSON CERTIFYING FORM:

Full Name			
Date of Birth (Optional)		Title	

B. LEGAL ENTITY INFORMATION:

Full Name			
Physical Address			
Entity Type (select one):			
<input type="checkbox"/> Corporation	<input type="checkbox"/> Non-profit Corporation		
<input type="checkbox"/> Doing Business As	<input type="checkbox"/> Partnership		
<input type="checkbox"/> Estate	<input type="checkbox"/> Professional Association (PA)		
<input type="checkbox"/> Financial Institution	<input type="checkbox"/> Professional Corporation (PC)		
<input type="checkbox"/> Joint Venture	<input type="checkbox"/> Professional Partnership		
<input type="checkbox"/> Limited Company (LC)	<input type="checkbox"/> Public Authority		
<input type="checkbox"/> Limited Liability Company (LLC)	<input type="checkbox"/> Public Limited Company (PLC)		
<input type="checkbox"/> Limited Liability Corporation (LLC)	<input type="checkbox"/> Sole Ownership/Proprietorship		
<input type="checkbox"/> Limited Liability Limited Partnership (LLLP)	<input type="checkbox"/> State and Local Public Funds		
<input type="checkbox"/> Limited Liability Partnership (LLP)	<input type="checkbox"/> Sub S Corporation		
<input type="checkbox"/> Limited Partnership (LP)	<input type="checkbox"/> Trust		
<input type="checkbox"/> Municipalities	<input type="checkbox"/> Unincorporated Association		
<input type="checkbox"/> Non-profit Association	<input type="checkbox"/> US Government Funds		
<input type="checkbox"/> Other (Describe):			

C. EXEMPTIONS:

Review the list of entity exemption types below and CHECK the BOX next to **ALL** that apply.

<input type="checkbox"/>	1. Sole Proprietorship
<input type="checkbox"/>	2. Unincorporated Associations (such as scout troops or youth sport leagues)
(If you only selected item numbered 1 and/or 2, SKIP to and complete section " F " below)	
<input type="checkbox"/>	3. Regulated Domestic Financial Institutions, including their holding companies
<input type="checkbox"/>	4. US & US state government entities
<input type="checkbox"/>	5. US publicly traded companies and subsidiaries (51% owned or greater) thereof
<input type="checkbox"/>	6. Securities and Exchange Commission (SEC) Registered Issuers of Securities
<input type="checkbox"/>	7. Exchanges and clearing agencies
<input type="checkbox"/>	8. Securities and Exchange Commission (SEC) Registered investment companies
<input type="checkbox"/>	9. Securities and Exchange Commission (SEC) Registered investment advisers
<input type="checkbox"/>	10. Commodity Futures Trading Commission (CFTC) registered entities
<input type="checkbox"/>	11. Registered public accounting firms
<input type="checkbox"/>	12. Trusts (non-statutory)
<input type="checkbox"/>	13. Estates
<input type="checkbox"/>	14. US State registered insurance companies
<input type="checkbox"/>	15. Entity registered with the Securities and Exchange Commission (SEC)
<input type="checkbox"/>	16. Financial Market Utilities
<input type="checkbox"/>	17. Non-US government agency engaged in US government activities only (non-commercial), e.g. Federal Reserve Board
<input type="checkbox"/>	18. Pooled investment vehicle operated or advised by a regulated domestic financial institution
<input type="checkbox"/>	19. Any legal entity whose sole relationship with SunTrust is to finance insurance premiums and for which payments are remitted directly by SunTrust to the insurance provider or broker, without possibility of cash refund
<input type="checkbox"/>	20. Any legal entity whose sole relationship with SunTrust is to finance the purchase or leasing of equipment and for which payments are remitted directly by the financial institution to the vendor or lessor of this equipment, without possibility of cash refund.
(If you only selected one or more of items numbered 3-20, SKIP to and complete section " F " below)	
<input type="checkbox"/>	21. Pooled investment vehicle NOT operated or advised by a regulated domestic financial institution
<input type="checkbox"/>	22. Charities and Non-Governmental Organizations (NGOs)
(If you only selected item numbered 21 and/or 22, SKIP to and complete sections " E " and " F " below)	
<input type="checkbox"/>	23. NONE OF THE ABOVE ITEMS APPLY
(If you only selected item number 23, you MUST complete sections " D ", " E ", and " F " below)	

D. BENEFICIAL OWNERS:

The following information is required for each beneficial owner (as defined on page 1).

- * For U.S. Persons: Provide Social Security Number (SSN); For NON-U.S. Persons: Provide Social Security Number if available
- ** For U.S. Persons: Driver's License or other government-issued Identification Documentation. For NON-U.S. Persons: Passport Number and Country of Issuance, or other similar identification number. In lieu of a passport number, NON-U.S. persons may also provide an alien identification card number, or number and country of issuance of any other government-issued document evidencing nationality or residence and bearing a photograph or similar safeguard

 Check here if **NO** individual meets this Section D Beneficial Owners Definition/criteria.

I. Beneficial owner 1 information:

Full Name			
Date of Birth		Social Security Number*	
Physical Address			
Identification**	Primary ID Type		Primary ID Number
	Issued By (State/Country/Province)		
+Indicates form OPTIONAL information. ID photocopy still required.	ID Issue Date+		ID Expiration Date+
% of Ownership			

II. Beneficial owner 2 information:

Full Name			
Date of Birth		Social Security Number*	
Physical Address			
Identification**	Primary ID Type		Primary ID Number
	Issued By (State/Country/Province)		
+Indicates form OPTIONAL information. ID photocopy still required.	ID Issue Date+		ID Expiration Date+
% of Ownership			

III. Beneficial owner 3 information:

Full Name			
Date of Birth		Social Security Number*	
Physical Address			
Identification**	Primary ID Type		Primary ID Number
	Issued By (State/Country/Province)		
+Indicates form OPTIONAL information. ID photocopy still required.	ID Issue Date+		ID Expiration Date+
% of Ownership			

IV. Beneficial owner 4 information:

Full Name			
Date of Birth		Social Security Number*	
Physical Address			
Identification**	Primary ID Type		Primary ID Number
	Issued By (State/Country/Province)		
+Indicates form OPTIONAL information. ID photocopy still required.	ID Issue Date+		ID Expiration Date+
% of Ownership			

V. Beneficial owner 5 information:

Full Name			
Date of Birth		Social Security Number*	
Physical Address			
Identification**	Primary ID Type		Primary ID Number
	Issued By (State/Country/Province)		
+Indicates form OPTIONAL information. ID photocopy still required.	ID Issue Date+		ID Expiration Date+
% of Ownership			

VI. Beneficial owner 6 information:

Full Name			
Date of Birth		Social Security Number*	
Physical Address			
Identification**	Primary ID Type		Primary ID Number
	Issued By (State/Country/Province)		
+Indicates form OPTIONAL information. ID photocopy still required.	ID Issue Date+		ID Expiration Date+
% of Ownership			

VII. Beneficial owner 7 information:

Full Name			
Date of Birth		Social Security Number*	
Physical Address			
Identification**	Primary ID Type		Primary ID Number
	Issued By (State/Country/Province)		
+Indicates form OPTIONAL information. ID photocopy still required.	ID Issue Date+		ID Expiration Date+
% of Ownership			

VIII. Beneficial owner 8 information:

Full Name			
Date of Birth		Social Security Number*	
Physical Address			
Identification**	Primary ID Type		Primary ID Number
	Issued By (State/Country/Province)		
+Indicates form OPTIONAL information. ID photocopy still required.	ID Issue Date+		ID Expiration Date+
% of Ownership			

IX. Beneficial owner 9 information:

Full Name			
Date of Birth		Social Security Number*	
Physical Address			
Identification**	Primary ID Type		Primary ID Number
	Issued By (State/Country/Province)		
+Indicates form OPTIONAL information. ID photocopy still required.	ID Issue Date+		ID Expiration Date+
% of Ownership			

X. Beneficial owner 10 information:

Full Name			
Date of Birth		Social Security Number*	
Physical Address			
Identification**	Primary ID Type		Primary ID Number
	Issued By (State/Country/Province)		
+Indicates form OPTIONAL information. ID photocopy still required.	ID Issue Date+		ID Expiration Date+
% of Ownership			

E. CONTROLLING PERSON:

The following information for one individual with significant responsibility for managing the legal entity listed above, such as:

- *An executive officer or senior manager (e.g., Chief Executive Officer, Chief Financial Officer, Chief Operating Officer, Managing Member, General Partner, President, Vice President, Treasurer); or*
- *Any other individual who regularly performs similar functions.*

* For U.S. Persons: Provide Social Security Number (SSN); For NON-U.S. Persons: Provide Tax Identification Number if available

** For U.S. Persons: Driver's License or other government-issued Identification Documentation. For NON-U.S. Persons: Passport Number and Country of Issuance, or other similar identification number. In lieu of a passport number, NON-U.S. persons may also provide an alien identification card number, or number and country of issuance of any other government-issued document evidencing nationality or residence and bearing a photograph or similar safeguard

(If appropriate, an individual listed under section (d) above may also be listed in this section (e)).

Full Name			
Date of Birth		Social Security Number*	
Physical Address			
Identification**	Primary ID Type		Primary ID Number
	Issued By (State/Country/Province)		
+Indicates form OPTIONAL information. ID photocopy still required.	ID Issue Date+		ID Expiration Date+

F. CERTIFICATION:

I, _____ (name of person signing this form), hereby certify, to the best of my knowledge, that the information provided above is complete and correct and that I will promptly notify this institution of any changes to this information.

Signature: _____ Date: _____

Legal entity Identifier _____ (Optional) Phone Number _____

Instructions for completing Certification Regarding Beneficial Owner(s)

Selecting client exemption type(s):

Choose one or more exempt client types on the list at Section C based on the descriptions provided below:

3. **Regulated Domestic Financial Institutions, including their holding companies.** A financial institution regulated by a federal functional regulator or a bank regulated by a state bank regulator.
4. **US & US state government entities.** A department or agency of the United States, or any State or of any political subdivision of a State – e.g. U.S. Department of the Treasury; State of Georgia; City of Decatur.
5. **US publicly traded companies and subsidiaries (51% owned or greater) thereof** - publicly traded companies (listed at 31 CFR 1020.315(b)(2) through (4)). U.S. publically traded companies and subsidiaries that are majority owned by these publically traded companies, e.g. Alphabet Inc. and its wholly owned subsidiary Google Inc.
6. **Securities and Exchange Commission (SEC) registered issuers of securities.** An issuer of a class of securities registered under section 12 of the Securities Exchange Act of 1934 or that is required to file reports under section 15(d) of that Act.
7. **Exchanges and clearing agencies** - as defined in section 3 of the Securities Exchange Act of 1934, that is registered under section 6 or 17A of that Act e.g. NYSE, NASDAQ.
8. **Securities and Exchange Commission (SEC) registered investment companies** - as defined in Section 3 of the Investment Company Act of 1940, that is registered with the SEC under that Act.
9. **Securities and Exchange Commission (SEC) registered investment advisers** - as defined in section 202(a)(11) of the Investment Advisers Act of 1940, that is registered with the SEC under that Act.
10. **CFTC-registered entities.** A registered entity, commodity pool operator, commodity trading advisor, retail foreign exchange dealer, swap dealer, or major swap participant, each as defined in section 1a of the Commodity Exchange Act, that is registered with the CFTC.
11. **Registered Public accounting firms registered under section 102 of the Sarbanes–Oxley Act.** e.g., Deloitte, Ernst & Young.
12. **Trusts (non-statutory).** The exclusion would generally cover non-statutory, i.e., created by contract, trusts. e.g. Irrevocable trusts, generation skipping trusts, life insurance trusts; etc.
14. **US State registered insurance companies** – e.g. State Farm; Geico; Cigna.
15. **Entity registered with the SEC** - entity registered with the SEC under the Securities and Exchange Act of 1934.
16. **Financial Market Utility** - A financial market utility designated by the Financial Stability Oversight Council under Title VIII of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010.
17. **Non-US government agency engaged in US government activities only (non-commercial),** e.g. Federal Reserve Board.
19. **Any legal entity whose sole relationship with SunTrust is to finance insurance premiums and for which payments are remitted directly by SunTrust to the insurance provider or broker, without possibility of cash refund.** Limited to clients of Premium Assignment Corporation (a SunTrust subsidiary). Those that have no other relationship with SunTrust.
20. **Any legal entity whose sole relationship with SunTrust is to finance the purchase or leasing of equipment and for which payments are remitted directly by the financial institution to the vendor or lessor of this equipment, without possibility of cash refund.** Limited to clients of SunTrust Leasing. Those that have no other relationship with SunTrust.
22. **Charities.** Charities and nonprofit entities.

To help the United States government fight the funding of terrorism and money laundering activities, Federal law requires all financial institutions to obtain, verify, and record information that identifies each person or entity that opens an account. SunTrust Escrow Services will ask for the relevant information pertaining to each of the parties in order to open the account requested.

Please provide the following information. Depending on entity and transaction type, additional information may be required.

Corporations	Limited Liability Companies	Partnerships	*Foreign Entities	Municipalities	Individuals
<ul style="list-style-type: none"> • Full legal name • Business purpose, market or industry • NAICS Code • IRS Form W-9 or W-8 as applicable (most recent IRS form required) • Articles of Incorporation • Primary place of business, physical address, phone number & primary contact person • Other operational locations (U.S. & foreign) • Countries generating 10% or more of overall annual revenue • Number of employees • Annual revenue for most recent fiscal year • Beneficial Ownership Form including photocopy ID(s) 	<ul style="list-style-type: none"> • Full legal name • Business purpose, market or industry • NAICS Code • IRS Form W-9 (most recent IRS form required) • Limited Liability Company Agreement or similar document • Primary place of business, physical address, phone number & primary contact person • Other operational locations (U.S. & foreign) • Countries generating 10% or more of overall annual revenue • Number of employees • Annual revenue for most recent fiscal year • Beneficial Ownership Form including photocopy ID(s) 	<ul style="list-style-type: none"> • Full legal name • Business purpose, market or industry • NAICS Code • IRS Form W-9 (most recent IRS form required) • Partnership Agreement or similar document • Primary place of business, physical address, phone number & primary contact person • Other operational locations (U.S. & foreign) • Countries generating 10% or more of overall annual revenue • Number of employees • Annual revenue for most recent fiscal year • Beneficial Ownership Form including photocopy ID(s) 	<ul style="list-style-type: none"> • Full legal name • Business purpose, market or industry • NAICS Code • IRS Form W-9 or W-8 as applicable (most recent IRS form required) • Articles of Incorporation, Organization or similar documents • Good Standing Certificate • Beneficial Ownership Form (Individuals with 10% or greater ownership) including photocopy ID(s) • Names & titles of principal business officers & authorized signors • Other locations (U.S. & foreign) • Countries generating 10% or more of overall annual revenue • Number of employees • Three years' financial statements • Bank Reference 	<ul style="list-style-type: none"> • Full legal name • IRS Form W-9 (most recent IRS form required) • Physical address, phone number & primary contact person • Governing resolution or similar document • NAICS Code • Date of legal formation • Annual revenue for most recent fiscal year • Beneficial Ownership Form 	<ul style="list-style-type: none"> • Full legal name • IRS Form W-9 or <u>original</u> W-8 as applicable (most recent IRS form required) • Copy of unexpired government issued ID documenting name, address & date of birth • Country of citizenship • Residential address & phone number • Employer name, occupation, business address & phone number • Employment start date • Annual Household income

*Foreign entities also include U.S. privately held companies which are controlled 25% or more by a foreign company, non-resident alien or a foreign publicly traded company.



**CITY OF CHATTANOOGA
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION**

1250 Market Street, Suite 2100
Chattanooga, TN 37402
Phone: (423) 643-6033
Fax: (423) 643-6008

CONSTRUCTION CHANGE REQUEST FORM (CRF)

Contract No.: _____	Change Request No.: _____
Contractor: _____	Date Issued: _____
Engineer: _____	Purchase Order No.: _____
Project Name: _____	Drawing No.: _____
Requested By: _____	

Description / Justification (Add more pages if necessary)

Revised Scope Description/Details

Item No.	Description	Unit	Qty	Unit Price	Items Total
Add					
Deduct					

Contractor Acknowledgement:

<input type="checkbox"/> No Change in Contract Amount is required.	<input type="checkbox"/> A Change in Contract Amount is required: \$ _____
<input type="checkbox"/> No Change in Contract Time is required.	<input type="checkbox"/> A Change in Contract Time is required: _____ days

APPROVALS

CONTRACTOR	CONSULTANT
Signature _____ Date _____	Signature _____ Date _____
CONSENT DECREE PROGRAM MANAGER	CITY PROJECT MANAGER
Change in Contract Amount is within the Contingency Amount authorized under Resolution No.: _____ <input type="checkbox"/> Yes <input type="checkbox"/> No	Change in Contract Amount is within the Contingency Amount authorized under Resolution No.: _____ <input type="checkbox"/> Yes <input type="checkbox"/> No
Signature _____ Date _____	Signature _____ Date _____
ASSISTANT CITY ENGINEER	DIRECTOR OF WASTE RESOURCES DIVISION
Proceed with Execution <input type="checkbox"/> Yes <input type="checkbox"/> No	Proceed with Execution <input type="checkbox"/> Yes <input type="checkbox"/> No
Signature _____ Date _____	Signature _____ Date _____

Part 1 General

1.01 Description

A. The work to be performed under this Contract shall consist of furnishing all labor, materials, tools, equipment and incidentals and performing all work required to construct complete in place and ready to operate:

1. Replace approximately 2,562 linear feet of 15-inch gravity sewer by pipe burst and open cut replacement. Pipe burst includes approximately 748 linear feet of upsized from 15-inch to 28-inch (OD) using HDPE DR17 pipe. Open cut replacement includes approximately 1,814 linear feet of 24-inch PVC sewer. Work also includes installation of nine (9) new 5-foot diameter precast concrete manholes (include one drop manhole) with watertight frame and cover; one vented manhole; one creek crossing with 36-inch steel casing and 24-inch carrier pipe; rehabilitation of two (2) manholes; temporary bypass pumping; and site restoration.

B. All work described above shall be performed as shown on the Drawings and as specified.

C. Work from Station 0+00 through Station 13+29.41 (MH S136G027) shall be completed within 110 days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions.

All Work will be substantially completed within 240 days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within 270 days after the date when the Contract Times commence to run.

1.02 Project Location

The equipment and materials to be furnished will be installed at the locations shown on the Drawings.

1.03 Quantities

The Owner reserves the right to alter the quantities of work to be performed or to extend or shorten the improvements at any time when and as found necessary, and the Contractor shall perform the work as altered, increased or decreased. Payment for such increased or decreased quantity will be made in accordance with the Instructions to Bidders. No allowance will be made for any change in anticipated profits nor shall such changes be considered as waiving or invalidating any conditions or provisions of the Contract and Bond.

1.04 Partial Owner Occupancy

The existing facilities to which these improvements are being made will continue operation during the period of construction. There shall not be any interruption in service. The Contractor is responsible for fines assessed due to his activities.

END OF SECTION

Part 1 General

1.01 Partial Occupancy By Owner

Whenever, in the opinion of the Engineer, any section or portion of the work or any structure is in suitable condition, it may be put into use upon the written order of the Engineer and such usage will not be held in any way as an acceptance of said work or structure, or any part thereof, or as a waiver of any of the provisions of these Specifications and the Contract. Pending final completion and acceptance of the Work, all necessary repairs and replacements, due to defective materials or workmanship or operations of the Contractor, for any section of the work so put into use shall be performed by the Contractor at Contractor's own expense.

END OF SECTION

Part 1 General

1.01 Scope

- A. The Bid lists each item of the Project for which payment will be made. No payment will be made for any items other than those listed in the Bid.
- B. Required items of work and incidentals necessary for the satisfactory completion of the work which are not specifically listed in the Bid, and which are not specified in this section to be measured or to be included in one of the items listed in the Bid, shall be considered as incidental to the work. All costs thereof, including Contractor's overhead costs and profit, shall be considered as included in the lump sum or unit prices bid for the various Bid items. The Contractor shall prepare the Bid accordingly.
- C. Work includes furnishing all plant, labor, equipment, tools and materials, which are not furnished by the Owner and performing all operations required to complete the work satisfactorily, in place, as specified and as indicated on the Drawings and Specifications.

1.02 Descriptions

- A. Measurement of an item of work will be by the unit indicated in the Bid.
- B. Final payment quantities shall be determined from the documented field measurements. The precision of final payment quantities shall match the precision shown for that item in the Bid.
- C. Payment will include all necessary and incidental related work not specified to be included in any other item of work listed in the Bid.
- D. Unless otherwise stated in individual sections of the Specifications or in the Bid, no separate payment will be made for any item of work, materials, parts, equipment, supplies or related items required to perform and complete the work. The costs for all such items required shall be included in the price bid for item of which it is a part.
- E. Payment will be made by extending unit prices multiplied by quantities provided and then summing the extended prices to reflect actual work. Such price and payment shall constitute full compensation to the Contractor for furnishing all plant, labor, equipment, tools and materials not furnished by the Owner and for performing all operations required to provide to the Owner the entire Project, complete in place, as specified and as indicated on the Drawings.
- F. "Products" shall mean materials or equipment permanently incorporated into the work.

1.03 General

- A. No separate payment shall be made for clearing and constructing access roads to sewers.
- B. The cost of moving and reestablishing landscape features, including labor and materials, shall be included in the unit price bid for the item to which it pertains.
- C. No separate payment shall be made for the cost incurred to repair damaged property. This includes concrete or asphalt driveways, except where payment is authorized for Same Trench Sewer Replacement.
- D. Construction Along Highways, Streets and Roadways: No separate payment shall be made for traffic control or maintaining highways, streets, roadways and driveways.
- E. No additional payment will be made for replacement of defective materials.
- F. All costs related to the implementation of the easement and permit stipulations shall be included in the unit price bid for the item to which it pertains.
- G. No separate payment will be made for clean-up and testing. Any cost for labor, materials and equipment required for clean-up shall be included in the unit price bid for the item to which it pertains.
- H. No separate or additional payment will be made for any special or unique method, means, techniques or equipment necessary for the Contractor's compliance with these Specifications, regulatory requirements, permits, laws or regulations which govern this Project.

1.04 Mobilization and Demobilization

- A. Mobilization is a lump sum pay item and is a one-time cost that shall include all Contractor incurred mobilization costs associated with the project.
- B. Demobilization is a lump sum pay item and is a one-time cost that shall include all Contractor incurred demobilization costs associated with the project.

1.05 Erosion Prevention and Sedimentation Control

- A. Erosion Prevention and Sediment Control are unit price pay items. Unit price items includes material, labor, installation and all measures and controls and shall include, but not be limited to, the controls shown on the plans. All measures shall be monitored and maintained per specifications.
- B. Maintenance of EPSC is a lump sum pay item and shall be payable in equal payments distributed throughout the contract duration.

1.06 Same Trench Sewer Replacement

A. Existing Utilities and Obstructions

1. Horizontal Conflict: Payments for conflicts with existing utilities shall be made only where additional manholes and/or additional lengths of pipe are approved by the Engineer. Said payment shall be made at the unit prices in the Bid. No other payment will be made for any delay or extra cost encountered by the Contractor due to protection, avoidance or relocation of existing utilities, mains or services or changing the horizontal alignment of the sewer.
2. Vertical Conflict: Where authorized by the Engineer, payment for additional depth of cut required to avoid vertical conflicts shall be made at the unit prices bid for gravity sewer. No payment will be made for relocation of existing utilities.

B. Location and Grade: No separate payment shall be made for survey work performed by or for the Contractor in the establishment of reference points, bench marks, limits of right-of-way or easement, including their restoration, as well as centerline or baseline points.

C. Trench Excavation: No separate payment will be made for trench excavation. All costs shall be included in the unit price bid for the item to which it pertains at the appropriate depth.

D. Sheeting, Bracing and Shoring: No separate payment will be made for providing any sheeting, bracing and shoring.

E. Dewatering Excavations: All costs of equipment, labor and materials required for dewatering shall be included in the price bid for the item to which it pertains.

F. Trench Stabilization

1. No payment for trench stabilization shall be authorized until after the trench has been dewatered. If the pipe is installed in an inadequately prepared trench bottom, the Engineer shall notify the Contractor in writing of the deficiency and will not authorize payment for that portion of that length of pipe which was improperly installed.
2. Payment for trench stabilization shall be made on the basis of the amount authorized and the unit price bid for Trench Stabilization. Payment shall include all costs for the removal and disposal of the unsuitable material and replacement with crushed stone. No additional payment will be made for material required for specified bedding.
3. Payment for filter fabric shall be at the unit price bid for Filter Fabric under trench stabilization. Payment shall include all costs for the placement of filter fabric.

G. Bedding and Haunching

Measurement and Payment

1. The unit price bid for pipe for gravity sewer shall include excavation of the trench to the depth below the pipe necessary to provide specified bedding and to lay the sewer to grade.
 2. No additional payment will be made for additional trench depth.
 3. No separate payment will be made for material used to provide specified bedding. The cost of all bedding materials shall be included in the unit price bid for the item to which it relates, except for trench stabilization.
 4. No additional payment will be made for improved bedding required to compensate for over excavation of the trench.
- H. Initial Backfill
1. No separate payment shall be made for initial backfill.
 2. No separate payment shall be made for drying out the initial backfill material in order to meet the compaction requirements.
 3. No separate payment shall be made for the adding of moisture to the initial backfill materials in order to meet the compaction requirements.
 4. No separate payment shall be made for providing select material if the insitu material cannot meet the compaction requirements.
- I. Final Backfilling
1. No additional payment will be made for additional material when excavated materials are used.
 2. No separate payment shall be made for drying out the final backfill material in order to meet the compaction requirements.
 3. No separate payment shall be made for the adding of moisture to the final backfill materials in order to meet the compaction requirements.
 4. No additional payment will be made for providing select material if the insitu material cannot meet the compaction requirements.
- J. Additional Material: No separate payment will be made for additional earth or fill materials imported to the Project site.
- K. No separate payment shall be made for detection tape or tracing wire.
- L. No payment will be made for cutting and beveling pipe.

1.05 Connections

- A. Connection to existing manhole is a unit price pay item. Unit price includes core drilling, flexible connection, pipe attachment, removal and offsite disposal of cored material.

1.06 Sewer Replacement by Pipe Bursting

- A. Payment for replacing existing sanitary sewer pipelines with new HDPE pipe installed with the pipe bursting method will be made at the unit price bid for each pipe diameter specified and shall include all annulus sealing material and launching pits. Price shall be full compensation for the installation of the new pipe, furnishing and placing of all materials, labor, tools, equipment, cleaning and preparation of existing pipe to receive the new pipe, and any other necessary task to complete the Project.
- B. Video inspection of final installed pipe will be paid under the conditions of Article 1.07 above. Post inspection videos conforming to Section 33 01 30.16 of these Specifications shall be submitted to and reviewed and approved by the Engineer prior to application for payment of the completed segments of Sewer Replacement by Pipe Bursting.

1.07 Pre-Installation and Post-Installation Closed Circuit Television (CCTV) Inspection of Sewers

- A. Payment will be made at the unit price bid for each pipe diameter and service lateral. Quantities shall be determined from field measurements verified in writing by the Engineer.
- B. Measurement for payment for sewers shall be from centerline of manhole to centerline of manhole. Measurement for payment for laterals shall be for lengths authorized by the Engineer.
- C. Payment will be based on the actual footage of pipe inspected and shall include all items necessary to perform the specified work and provide the specified work product.

1.08 Subsurface Manhole Rehabilitation

- A. Payment will be made at the unit price bid for each manhole diameter and respective levels. Quantities shall be determined from field measurements verified in writing by the Engineer.
- B. Vertical depth measurement shall be to the actual dimension of the work.
- C. Payment will be based on the actual vertical footage of manhole rehabilitated. Additional setups required to rehabilitate manholes to the level specified in Section 33 01 30.83 will not be counted for payment purposes.
- D. Payment shall not be made for the installed Type 2 Polymer Resin-based lining until after:

1. The manhole passes the vacuum test
 2. The final post-rehabilitation CCTV showing installed pipe connecting to the manhole as specified elsewhere in the Specification.
- E. No separate payment will be made for grouting required to stop leaks or other purposes.
- F. Additional work items required to rehabilitate and test the lines to the level specified in Section 33 01 30.83 will not be counted for payment purposes.

1.09 Precast Concrete Manhole Replacement

- A. Measurement for payment at the unit price for manholes shall be made on a unit quantity basis.
- B. Payment shall include removal of existing manhole, base, precast section, concrete riser rings, gaskets, cast-in or core drilled pipe openings, grout, vacuum testing, frame and either standard or watertight cover as depicted in project drawings.
- C. No separate or additional payment will be made for testing, bedding, connecting pipes to manholes, constructing invert, plugging abandoned pipes, risers or frame and cover.
- D. Drop manhole shall include drop connection, drop encasements, pipe and pipe fittings.
- E. Manhole vent assembly is a unit price item and includes all materials and labor, vent pipe, pipe support, core into manhole, to complete.
- F. Flowable Fill is a cubic yard unit price pay item and includes all materials and labor to complete.
- G. Abandon manhole is a unit price pay item and includes all materials and labor, cutting and plugging, removing and disposing of the frame, cover, grade rings, and exposed riser sections and filling abandoned manhole.

1.10 Sewer Flow Control

- A. Sewer flow control is a lump sum pay item. Lump sum price bid for sewer flow control is full compensation for this item and includes by-pass pumps with standby units, fuel, maintenance, operation, supervision, monitoring, suction and discharge piping.

1.11 Pavement Removal and Replacement

- A. Payment for removing and replacing pavement will be made as a separate item based

on the measured quantity replaced at the unit price in the Bid. The unit price bid shall include all costs associated with removing and replacing pavement, including providing select backfill if necessary, traffic control and temporary measures for maintaining traffic. Only those lengths of pavement replacement associated with Same Trench Sewer Replacement or Open Cut Service Lateral Replacement will be eligible for payment.

- B. Payment for removing and replacing pavement will be made only for that length for which the pipeline is constructed underneath the pavement as shown on the Drawings.
- C. Payment for soils testing shall be made from the "soils and concrete testing" cash allowance. No payment shall be made for tests that fail to verify required results.
- D. No additional payment will be made for removing and replacing damaged adjacent pavement.
- E. Costs for removal and replacement of sidewalks and curb and gutter shall be included in the unit price bid for the item to which it pertains.

1.12 Site Restoration

- A. Payment for sod and seed will be made as separate items based on the measured quantity replaced at the unit price in the Bid. The unit price bid shall include all costs associated with all labor, materials including topsoil, water and equipment required to complete the restoration to its original or better condition. Item includes topsoil, maintenance
- B. Use of sod shall be as directed by the Owner. Type of Sod shall match existing conditions.

1.13 Cash Allowances

- A. General
 - 1. The Contractor shall include in the Bid Total all allowances stated in the Contract Documents. These allowances shall cover the net cost of the services provided by a firm selected by the Owner. The Contractor's handling costs, labor, overhead, profit and other expenses contemplated for the original allowance shall be included in the items to which they pertain and not in allowances.
 - 2. No payment will be made for nonproductive time on the part of testing personnel due to the Contractor's failure to properly coordinate testing activities with the work schedule or the Contractor's problems with maintaining equipment in good working condition. The Contractor shall make all necessary excavations and shall supply any samples of materials necessary for conducting compaction, density tests, concrete tests, cured-in-place pipe samples and any other samples required for testing.

Measurement and Payment

3. No payment shall be provided for services that fail to verify required results.
- B. Should the net cost be more or 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.
- C. Documentation
1. Submit copies of the invoices with each periodic payment request from the firm providing the services.
 2. Submit results of services provided which verify required results.
- D. Schedule of Cash Allowances
1. Soil, Concrete and Materials Testing: Allow the amount provided in the Bid for the services of a geotechnical engineering firm and testing laboratory to verify soils conditions including trench excavation and backfill, and similar issues and for the testing of concrete cylinders for poured in place concrete and testing physical properties of manhole lining materials.
 2. Construction Verification Surveying
 - a. Allow the amount provided in the Bid for construction surveying by an independent surveying firm, selected by the Owner, to perform horizontal and vertical alignment checks at the discretion of the Engineer.
 - b. This allowance is solely for the use of the Engineer for verification of the Contractor's reference points, centerlines and work performed. The presence of this cash allowance in no way relieves the Contractor of the responsibility of installing reference points, centerlines, temporary bench marks or verifying that the work has been performed accurately.
 3. Landscaping: Allow the amount provided in the Bid for the services of a landscape company, approved by Owner, to provide and install replacement trees, shrubs, buffer restoration, ground cover, etc. disturbed by construction.
 4. CGCC Site Restoration: Allow the amount provided in the Bid for restoration of the CGCC. Such restoration shall include, but may not be limited to, Bermuda and fescue sod, cart path, and irrigation system. Materials and labor to perform all restoration shall be covered by the Allowance. Material suppliers shall be as designated by the CGCC. Installers shall be the CGCC or their designated representatives. Payments shall be made directly to the CGCC. The Contractor, Owner and CGCC will verify installed quantity for all work prior to payment.

END OF SECTION

Part 1 General

1.01 Scope

This section outlines the restrictions and requirements for substitutions, product and manufacturer options, and construction method options.

1.02 Definitions

- A. For the purposes of these Contract Documents, a “substitute item” shall be defined as one of the following:
 - 1. A product or manufacturer offered as a replacement to a specified product or manufacturer.
 - 2. A product or manufacturer offered in addition to a specified product or manufacturer.
- B. For the purposes of these Contract Documents, a “substitute construction method” shall be defined as one of the following:
 - 1. A mean, method, technique, sequence or procedure of construction offered as a replacement for a specified mean, method, technique, sequence or procedure of construction.
 - 2. A mean, method, technique, sequence or procedure of construction offered in addition to a specified mean, method, technique, sequence or procedure of construction.

1.03 General

- A. An item or construction method, which is offered where no specific product, manufacturer, mean, method, technique, sequence or procedure of construction is specified or shown on the Drawings, shall not be considered a substitute and shall be at the option of the Contractor, subject to the provisions in the Contract Documents for that item or construction method.
- B. For products specified only by a referenced standard, the Contractor may select any product by any manufacturer, which meets the requirements of the Specifications, unless indicated otherwise in the Contract Documents.
- C. If the manufacturer is named on the Drawings or in the Specifications as an acceptable manufacturer, products of that manufacturer meeting all requirements of the Specifications and Drawings are acceptable.
- D. Whenever the Engineer's design is based on a specific product of a particular manufacturer, that manufacturer will be shown on the Drawings and/or listed first in the

Substitutions and Options

list of approved manufacturers in the Specifications. Any Bidder intending to furnish products of other than the first listed manufacturer, or furnish substitute items, shall

1. Verify that the item being furnished will fit in the space allowed, perform the same functions and have the same capabilities as the item specified,
2. Include in its Bid the cost of all accessory items which may be required by the other listed substitute product,
3. Include the cost of any architectural, structural, mechanical, piping, electrical or other modifications required, and
4. Include the cost of required additional work by the Engineer, if any, to accommodate the item.

1.04 Approvals

Approval, of a substitution as an acceptable manufacturer, of the Engineer is dependent on 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.

1.05 Substitutions and Options

A. After Notice to Proceed

1. Substitute items will be considered only if the term "equal to" precedes the names of acceptable manufacturers in the Specification.
2. Where items are specified by referenced standard or specified as indicated in Article 1.03, Paragraph A above, such items shall be submitted to the Engineer for review.
3. The Contractor shall submit shop drawings on the substitute item for the Engineer's review in accordance with Section 01 33 23.

B. Prior to Opening of Bids

1. No consideration or approvals will be made for products specified by a referenced standard, or specified as indicated in Article 1.03, Paragraph A, above. Such consideration may occur only after the Notice to Proceed.
2. No consideration or approvals will be made for products being offered where the term "equal to" precedes the name of an approved product. Such substitution consideration may occur only after the Notice to Proceed.

END OF SECTION

Part 1 General

1.01 Scope

- A. Work under this Section includes all scheduling and administering of pre-construction and progress meetings as herein specified and necessary for the proper and complete performance of this work.
- B. Scheduling and Administration by Engineer:
 - 1. Prepare agenda.
 - 2. Make physical arrangements for the meetings.
 - 3. Preside at meetings.
 - 4. Record minutes and include significant proceedings and decisions.
 - 5. Distribute copies of the minutes to participants.

1.02 Preconstruction Conference

- A. The Engineer shall schedule the preconstruction conference prior to the issuance of the Notice to Proceed.
- B. Representatives of the following parties are to be in attendance at the meeting:
 - 1. Owner.
 - 2. Engineer.
 - 3. Contractor and superintendent.
 - 4. Major subcontractors.
 - 5. Representatives of governmental or regulatory agencies when appropriate.
- C. The agenda for the preconstruction conference shall consist of the following as a minimum:
 - 1. Distribute and discuss a list of major subcontractors and a tentative construction schedule.
 - 2. Critical work sequencing.
 - 3. Designation of responsible personnel and emergency telephone numbers.
 - 4. Processing of field decisions and change orders.

Project Meetings

5. Adequacy of distribution of Contract Documents.
6. Schedule and submittal of shop drawings, product data and samples.
7. Pay request format, submittal cutoff date, pay date and retainage.
8. Procedures for maintaining record documents.
9. Use of premises, including office and storage areas and Owner's requirements.
10. Major equipment deliveries and priorities.
11. Safety and first aid procedures.
12. Security procedures.
13. Housekeeping procedures.
14. Work hours.

1.03 Project Coordination Meetings

- A. Schedule regular monthly meetings as directed by the Engineer.
- B. Hold called meetings as the progress of the work dictates.
- C. The meetings shall be held at the location indicated by the Engineer.
- D. Representatives of the following parties are to be in attendance at the meetings:
 1. Engineer.
 2. Contractor and superintendent.
 3. Major subcontractors as pertinent to the agenda.
 4. Owner's representative as appropriate.
 5. Representatives of governmental or other regulatory agencies as appropriate.
- E. The minimum agenda for progress meetings shall consist of the following:
 1. Review and approve minutes of previous meetings.
 2. Review work progress since last meeting.
 3. Note field observations, problems and decisions.

4. Identify problems which impede planned progress.
5. Review off-site fabrication problems.
6. Review Contractor's corrective measures and procedures to regain plan schedule.
7. Review Contractor's revision to the construction schedule as outlined in the Supplementary Conditions.
8. Review submittal schedule; expedite as required to maintain schedule.
9. Maintenance of quality and work standards.
10. Review changes proposed by Owner for their effect on the construction schedule and completion date.
11. Complete other current business.

END OF SECTION

Part 1 General

1.01 Scope

- A. The work under this Section includes preparing, furnishing, distributing, and periodic updating of the construction schedules as specified herein.
- B. The purpose of the schedule is to demonstrate that the Contractor can complete the overall Project within the Contract Time and meet all required interim milestones.
- C. Work from Station 0+00 through Station 13+29.41 (MH S136G027) shall be completed within 110 days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions.

All Work will be substantially completed within 240 days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within 270 days after the date when the Contract Times commence to run.

1.02 Submittals

- A. Overall Project Schedule (OPS)
 - 1. Submit the schedule within 10 days after date of the Notice to Proceed.
 - 2. The Engineer will review the schedule and return it within 10 days after receipt.
 - 3. If required, resubmit within 10 days after receipt of a returned copy.
- B. Near Term Schedule (NTS)
 - 1. Submit the first Near Term Schedule within 10 days of the Notice to Proceed.
 - 2. The Engineer will review the schedule and return it within 10 days after receipt.
- C. Submit an update of the OPS and NTS with each progress payment request.
- D. Submit the number of copies required by the Contractor, plus four copies to be retained by the Engineer.

1.03 Approval

Approval of the Contractor's detailed construction program and revisions thereto shall in no way relieve the Contractor of any of Contractor's duties and obligations under the Contract. Approval is limited to the format of the schedule and does not in any way indicate approval of, or concurrence with, the Contractor's means, methods and ability to carry out the work.

1.04 Overall Project Schedule (OPS)

- A. The Contractor shall submit to the Owner for approval a detailed Overall Project Schedule of the Contractor's proposed operations for the duration of the Project. The OPS shall be in the form of a Gantt/bar chart.
- B. Gantt/Bar Chart Schedule
 - 1. Each activity with a duration of five or more days shall be identified by a separate bar. Activities with a duration of more than 20 days shall be sub-divided into separate activities.
 - 2. The schedule shall include activities for shop drawing preparation and review, fabrication, delivery, and installation of major or critical path materials and equipment items.
 - 3. The schedule shall show the proposed start and completion date for each activity. A separate listing of activity start and stop dates and working day requirements shall be provided unless the information is shown in text form on the Gantt/bar chart.
 - 4. The schedule shall identify the Notice to Proceed date, the Contract Completion date, major milestone dates, and a critical path.
 - 5. The schedule shall be printed on a maximum 11 x 17-inch size paper. If the OPS needs to be shown on multiple sheets, a simplified, one page, summary bar chart showing the entire Project shall be provided.
 - 6. The schedule shall have a horizontal time scale based on calendar days and shall identify the Monday of each week.
 - 7. The schedule shall show the precedence relationship for each activity.

1.05 Near Term Schedule (NTS)

- A. The Contractor shall develop and refine a detailed Near Term Schedule showing the day to day activities with committed completion dates which must be performed during the upcoming 30 day period. The detailed schedule shall represent the Contractor's best approach to the Work which must be accomplished to maintain progress consistent with the Overall Project Schedule.
- B. The Near Term Schedule shall be in the form of Gantt/bar chart and shall include a written narrative description of all activities to be performed and describe corrective action to be taken for items that are behind schedule.

1.06 Updating

- A. Show all changes occurring since previous submission of the updated schedule.

- B. Indicate progress of each activity and show actual completion dates.
- C. The Contractor shall be prepared to provide a narrative report at the Project Coordination Meetings. The report shall include the following:
 - 1. A description of the overall Project status and comparison to the OPS.
 - 2. Identify activities which are behind schedule and describe corrective action to be taken.
 - 3. A description of changes or revisions to the Project and their effect on the OPS.
 - 4. A description of the Near Term Schedule of the activities to be completed during the next 30 days. The report shall include a description of all activities requiring participation by the Engineer and/or Owner.

END OF SECTION

Part 1 General

1.01 Scope

- A. The Contractor shall furnish all equipment and labor materials required to provide the Owner with digital construction videos and photographs of the Project. The requirements of this section are independent of and in addition to the requirements in Division 33 of the Specifications.
- B. Photo and video files shall become the property of the Owner and none of the videos or photographs shall be published without express permission of the Owner.

1.02 Pre and Post Construction Videos and Photographs

- A. Prior to the beginning of any work, the Contractor shall take videos and photographs of the work area to record existing conditions.
- B. Following completion of the work, another set of videos and photographs shall be made showing the same areas and features as in the pre-construction videos and photographs.
- C. All conditions which might later be subject to disagreement shall be shown in sufficient detail to provide a basis for decisions.

1.03 File Format, Media and Submittals

- A. Photographs shall be in "jpg" format.
- B. Videos shall be in a format viewable by Microsoft Windows Media Player or Apple QuickTime Player. Audio narration is desirable.
- C. Files shall be named such that what is being viewed is self evident.
- D. Files shall be submitted on a compact disk (CD) or a digital video disk (DVD). If submitted on DVD, disk shall be recorded in "Minus R" format.
- E. The pre-construction videos and photographs shall be submitted to the Engineer within 25 calendar days after the date of receipt by the Contractor of Notice to Proceed. Post-construction videos and photographs shall be provided prior to final acceptance of the Project.

END

OF SECTION

Part 1 General

1.01 Scope

- A. The work under this Section includes submittal to the Engineer of shop drawings, product data and samples required by the various Sections of these Specifications.
- B. Submittal Contents: The submittal contents required are specified in each Section.
- C. Definitions: Submittals are categorized as follows:
 - 1. Shop Drawings
 - a. Shop drawings shall include technical data, drawings, diagrams, procedure and methodology, performance curves, schedules, templates, patterns, test reports, calculations, instructions, measurements and similar information as applicable to the specific item for which the shop drawing is prepared.
 - b. Provide newly-prepared information, on bond sheets, with graphic information at accurate scale (except as otherwise indicated) or appropriate number of prints hereof, with name or preparer (firm name) indicated. The Contract Drawings shall not be traced or reproduced by any method for use as or in lieu of detail shop drawings. Show dimensions and note dimensions that are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards and special coordination requirements. Do not allow shop drawings to be used in connection with the Work without appropriate final "Action" markings by the Engineer.
 - c. Drawings shall be presented in a clear and thorough manner. Details shall be identified by reference to sheet and detail, Specification Section, schedule or room numbers shown on the Contract Drawings.
 - d. Minimum assembly drawings sheet size shall be 24 x 36-inches.
 - e. Minimum detail sheet size shall be 8-1/2 x 11-inches.
 - f. Minimum Scale:
 - i. Assembly Drawings Sheet, Scale: 1-inch = 30 feet.
 - ii. Detail Sheet, Scale: 1/4-inch = 1 foot.
 - 2. Product Data
 - a. Product data includes standard printed information on materials, products and systems, not specially prepared for this Project, other than the

designation of selections from among available choices printed therein.

- b. Collect required data into one submittal for each unit of work or system, and mark each copy to show which choices and options are applicable to the Project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked and special coordination requirements.
3. Samples
 - a. Samples include both fabricated and un-fabricated physical examples of materials, products and units of work, both as complete units and as smaller portions of units of work, either for limited visual inspection or, where indicated, for more detailed testing and analysis.
 - b. Provide units identical with final condition of proposed materials or products for the work. Include "range" samples, not less than three units, where unavoidable variations must be expected, and describe or identify variations between units of each set. Provide full set of optional samples where the Engineer's selection is required. Prepare samples to match the Engineer's sample where indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations and compliance with standards. Samples are submitted for review and confirmation of color, pattern, texture and "kind" by the Engineer. Engineer will note "test" samples, except as otherwise indicated, for other requirements, which are the exclusive responsibility of the Contractor.
 4. Miscellaneous submittals related directly to the work (non-administrative) include warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, statements of applicability, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, security/protection/safety keys and similar information, devices and materials applicable to the work but not processed as shop drawings, product data or samples.

1.02 Specific Category Requirements

- A. General: Except as otherwise indicated in the individual work sections, comply with general requirements specified herein for each indicated category of submittal. Submittals shall contain:
 1. The date of submittal and the dates of any previous submittals.
 2. The Project title.
 3. Numerical submittal numbers, starting with 1.0, 2.0, etc. Revisions to be numbered 1.1, 1.2, etc.

4. The Names of:
 - a. Contractor
 - b. Supplier
 - c. Manufacturer
5. Identification of the product, with the Specification Section number, permanent equipment tag numbers and applicable Drawing No.
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
9. Notification to the Engineer in writing, at time of submissions, of any deviations on the submittals from requirements of the Contract Documents.
10. Identification of revisions on resubmittals.
11. An 8 x 3-inch blank space for Contractor and Engineer stamps.
12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria and coordination of the information within the submittal with requirements of the work and of Contract Documents.
13. Submittal sheets or Drawings showing more than the particular item under consideration shall have all but the pertinent description of the item for which review is requested crossed out.

1.03 Routing of Submittals

- A. Submittals and routine correspondence shall be routed as follows:
 1. Supplier to Contractor (through representative if applicable)
 2. Contractor to Engineer
 3. Engineer to Contractor and Owner
 4. Contractor to Supplier

Part 2 Products

2.01 Shop Drawings

- A. Unless otherwise specifically directed by the Engineer, make all shop drawings accurately to a scale sufficiently large to show all pertinent features of the item and its method of connection to the work.
- B. Submit all shop assembly drawings, larger than 11 x 17-inches, in the form of one reproducible transparency with two opaque prints or bluelines.
- C. Submit all shop drawings, 11 x 17-inches and smaller, in the form of six opaque prints or bluelines.
- D. One reproducible for all submittals larger than 11 x 17-inches and no more than three prints of other submittals will be returned to the Contractor.

2.02 Manufacturer's Literature

- A. Where content of submitted literature from manufacturers includes data not pertinent to this submittal, clearly indicate which portion of the contents is being submitted for the Engineer's review.
- B. Submit the number of copies which are required to be returned (not to exceed three) plus three copies which will be retained by the Engineer.

2.03 Samples

- A. Samples shall illustrate materials, equipment or workmanship and established standards by which completed work is judged.
- B. Unless otherwise specifically directed by the Engineer, all samples shall be of the precise article proposed to be furnished.
- C. Submit all samples in the quantity which is required to be returned plus one sample which will be retained by the Engineer.

2.04 Colors

- A. Unless the precise color and pattern is specifically described in the Contract Documents, wherever a choice of color or pattern is available in a specified product, submit accurate color charts and pattern charts to the Engineer for review and selection.
- B. Unless all available colors and patterns have identical costs and identical wearing capabilities, and are identically suited to the installation, completely describe the relative costs and capabilities of each.

Part 3 Execution

3.01 Contractor's Coordination of Submittals

- A. Prior to submittal for the Engineer's review, the Contractor shall use all means necessary to fully coordinate all material, including the following procedures:
 - 1. Determine and verify all field dimensions and conditions, catalog numbers and similar data.
 - 2. Coordinate as required with all trades and all public agencies involved.
 - 3. Submit a written statement of review and compliance with the requirements of all applicable technical Specifications as well as the requirements of this Section.
 - 4. Clearly indicate in a letter or memorandum on the manufacturer's or fabricator's letterhead, all deviations from the Contract Documents.
- B. Each and every copy of the shop drawings and data shall bear the Contractor's stamp showing that they have been so checked. Shop drawings submitted to the Engineer without the Contractor's stamp will be returned to the Contractor for conformance with this requirement.
- C. The Owner may backcharge the Contractor for costs associated with having to review a particular shop drawing, product data or sample more than two times to receive a "No Exceptions Taken" mark.
- D. Grouping of Submittals
 - 1. Unless otherwise specifically permitted by the Engineer, make all submittals in groups containing all associated items.
 - 2. No review will be given to partial submittals of shop drawings for items which interconnect and/or are interdependent. It is the Contractor's responsibility to assemble the shop drawings for all such interconnecting and/or interdependent items, check them and then make one submittal to the Engineer along with Contractor's comments as to compliance, non-compliance or features requiring special attention.
- E. Schedule of Submittals
 - 1. Within 30 days of Contract award and prior to any shop drawing submittal, the Contractor shall submit a schedule showing the estimated date of submittal and the desired approval date for each shop drawing anticipated. A reasonable period shall be scheduled for review and comments. Time lost due to unacceptable submittals shall be the Contractor's responsibility and some time allowance for resubmittal shall be provided. The schedule shall provide for submittal of items which relate to one another to be submitted concurrently.

3.02 Timing of Submittals

- A. Make all submittals far enough in advance of scheduled dates for installation to provide all required time for reviews, for securing necessary approvals, for possible revision and resubmittal, and for placing orders and securing delivery.
- B. In scheduling, allow sufficient time for the Engineer's review following the receipt of the submittal.

3.03 Reviewed Shop Drawings

- A. Engineer Review
 - 1. Allow a minimum of 30 days for the Engineer's initial processing of each submittal requiring review and response, except allow longer periods where processing must be delayed for coordination with subsequent submittals. The Engineer will advise the Contractor promptly when it is determined that a submittal being processed must be delayed for coordination. Allow a minimum of two weeks for reprocessing each submittal. Advise the Engineer on each submittal as to whether processing time is critical to progress of the work, and therefore the work would be expedited if processing time could be foreshortened.
 - 2. Acceptable submittals will be marked "No Exceptions Taken". A minimum of three copies will be retained by the Engineer for Engineer's and the Owner's use and the remaining copies will be returned to the Contractor.
 - 3. Submittals requiring minor corrections before the product is acceptable will be marked "Make Corrections Noted". The Contractor may order, fabricate and ship the items included in the submittals, provided the indicated corrections are made. Drawings must be resubmitted for review and marked "No Exceptions Taken" prior to installation or use of products.
 - 4. Submittals marked "Amend and Resubmit" must be revised to reflect required changes and the initial review procedure repeated.
 - 5. The "Rejected - See Remarks" notation is used to indicate products which are not acceptable. Upon return of a submittal so marked, the Contractor shall repeat the initial review procedure utilizing acceptable products.
 - 6. Only two copies of items marked "Amend and Resubmit" and "Rejected - See Remarks" will be reviewed and marked. One copy will be retained by the Engineer and the other copy with all remaining unmarked copies will be returned to the Contractor for resubmittal.
- B. No work or products shall be installed without a drawing or submittal bearing the "No Exceptions Taken" notation. The Contractor shall maintain at the job site a complete set of shop drawings bearing the Engineer's stamp.
- C. Substitutions: In the event the Contractor obtains the Engineer's approval for the use of products other than those which are listed first in the Contract Documents, the

Contractor shall, at the Contractor's own expense and using methods approved by the Engineer, make any changes to structures, piping and electrical work that may be necessary to accommodate these products.

- D. Use of the "No Exceptions Taken" notation on shop drawings or other submittals is general and shall not relieve the Contractor of the responsibility of furnishing products of the proper dimension, size, quality, quantity, materials and all performance characteristics, to efficiently perform the requirements and intent of the Contract Documents. The Engineer's review shall not relieve the Contractor of responsibility for errors of any kind on the shop drawings. Review is intended only to assure conformance with the design concept of the Project and compliance with the information given in the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site. The Contractor is also responsible for information that pertains solely to the fabrication processes or to the technique of construction and for the coordination of the work of all trades.

3.04 Resubmission Requirements

- A. Shop Drawings
1. Revise initial Drawings as required and resubmit as specified for initial submittal, with the resubmittal number shown.
 2. Indicate on Drawings all changes which have been made other than those requested by the Engineer.
- B. Project Data and Samples: Resubmit new data and samples as specified for initial submittal, with the resubmittal number shown.

END OF SECTION

Part 1 General

1.01 Scope

- A. Permits and Responsibilities: The Contractor shall, without additional expense to the Owner, be responsible for obtaining all necessary licenses and permits, including building permits, and for complying with any applicable federal, state, county and municipal laws, codes and regulations, in connection with the prosecution of the work.
- B. The Contractor shall take proper safety and health precautions to protect the work, the workers, the public and the property of others.
- C. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the work, except for any completed unit of construction thereof which may heretofore have been accepted.

END OF SECTION

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
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 Codes and Standards

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. Electrical and Instrumentation

AEIC Association of Edison Illuminating Companies
 AIEE American Institute of Electrical Engineers
 EIA Electronic Industries Association
 ICEA Insulated Cable Engineers Association
 IEC International Electrotechnical Commission
 IEEE Institute of Electrical and Electronic Engineers
 IES Illuminating Engineering Society
 IPC Institute of Printed Circuits
 IPCEA Insulated Power Cable Engineers Association
 ISA The Instrumentation, Systems, and Automation Society
 NEC National Electric Code
 NEMA National Electrical Manufacturers Association
 NFPA National Fire Protection Association
 REA Rural Electrification Administration
 TIA Telecommunications Industries Association
 UL Underwriter's Laboratories
 VRCI Variable Resistive Components Institute

E. Aluminum

AA Aluminum Association
 AAMA American Architectural Manufacturers Association

F. 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 Prestressed Concrete Institute

G. Welding

ASME American Society of Mechanical Engineers
 AWS American Welding Society

H. Government and Technical Organizations

AIA American Institute of Architects

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
EDA	Economic Development Administration
EPA	Environmental Protection Agency
FCC	Federal Communications Commission
FmHA	Farmers Home Administration
FS	Federal Specifications
IAI	International Association of Identification
ISEA	Industrial Safety Equipment Association
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
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
SI	Salt Institute
SPI	The Society of the Plastics Industry, Inc.
USDC	United States Department of Commerce
WEF	Water Environment Federation

I. General Building Construction

AHA	American Hardboard Association
AHAM	Association of Home Appliance Manufacturers
AITC	American Institute of Timber Construction
APA	American Parquet Association, Inc.
APA	American Plywood Association
BHMA	Builders Hardware Manufacturers Association
BIFMA	Business and Institutional Furniture Manufacturers Association
DHI	Door and Hardware Institute
FM	Factory Mutual Fire Insurance Company
HPMA	Hardwood Plywood Manufacturers Association
HTI	Hand Tools Institute
IME	Institute of Makers of Explosives
ISANTA	International Staple, Nail and Tool Association
ISDSI	Insulated Steel Door Systems Institute
IWS	Insect Screening Weavers Association
MBMA	Metal Building Manufacturers Association
NAAMM	National Association of Architectural Metal Manufacturers
NAGDM	National Association of Garage Door Manufacturers
NCCLS	National Committee for Clinical Laboratory Standards
NFPA	National Fire Protection Association
NFSA	National Fertilizer Solutions Association

 Codes and Standards

NKCA	National Kitchen Cabinet Association
NWMA	National Woodwork Manufacturers Association
NWWDA	National Wood Window and Door Association
RMA	Rubber Manufacturers Association
SBC	SBCC Standard Building Code
SDI	Steel Door Institute
SIA	Scaffold Industry Association
SMA	Screen Manufacturers Association
SPRI	Single-Ply Roofing Institute
TCA	Tile Council of America
UBC	Uniform Building Code

J. Roadways

AREA	American Railway Engineering Association
DOT	Tennessee Department of Transportation

K. Plumbing

AGA	American Gas Association
NSF	National Sanitation Foundation
PDI	Plumbing Drainage Institute
SPC	SBCC Standard Plumbing Code

L. Refrigeration, Heating, and Air Conditioning

AMCA	Air Movement and Control Association
ARI	American Refrigeration Institute
ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
CGA	Compressed Gas Association
CTI	Cooling Tower Institute
HEI	Heat Exchange Institute
IIAR	International Institute of Ammonia Refrigeration
NB	National Board of Boilers and Pressure Vessel Inspectors
PFMA	Power Fan Manufacturers Association
SAE	Society of Automotive Engineers
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SMC	SBCC Standard Mechanical Code
TEMA	Tubular Exchangers Manufacturers Association

M. Equipment

AFBMA	Anti-Friction Bearing Manufacturers Association, Inc.
AGMA	American Gear Manufacturers Association
ALI	Automotive Lift Institute
CEMA	Conveyor Equipment Manufacturers Association
CMAA	Crane Manufacturers Association of America
DEMA	Diesel Engine Manufacturers Association
MMA	Monorail 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.

END OF SECTION

Part 1 General

1.1 Requirements Included

- A. General quality control
- B. Workmanship
- C. Manufacturer's instructions
- D. Manufacturer's certificates
- E. Manufacturer's field services

1.2 Related Requirements

- A. Section 00 21 13 - Instructions to Bidders
- B. Section 00 72 00 - General Conditions
- C. Section 01 45 29 - Testing Laboratory Services
- D. Section 00 73 00 – Supplementary Conditions

1.3 Quality Control, General

- A. The Contractor will maintain construction quality control (CQC) over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. The Contractor shall conduct 100 percent of the CQC testing and surveying necessary for completion of the Work and incur all costs associated with CQC except as noted herein.
- C. The OWNER shall retain the services of a construction material testing firm and be responsible for quality assurance and acceptance testing (CQA) for acceptance and payment of associated work or product in accordance with the contract documents, per Section 01 45 29, Testing Laboratory Services.
- D. The Contractor shall be responsible for the cost of retesting of any failed acceptance testing, such additional cost will be deducted from subsequent pay request upon submittal of invoicing from the construction material firm and documentation of the failed tests. Cost for retesting shall follow the unit price schedule found in the Appendix.

1.4 Workmanship

- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

Quality Control

- B. Perform work by persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.5 Manufacturer's Instructions

- A. Comply with instructions in full detail, including each step in sequence. Should instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

1.6 Manufacturer's Certificates

- A. When required by individual Specification Section, submit manufacturer's certificate, in duplicate, that products meet or exceed specified requirements.

1.7 Manufacturer's Field Service

- A. When specified in respective Specification Sections, require manufacturer to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to make appropriate recommendations.
- B. Representative shall submit written report to Engineer listing observations and recommendations.

Part 2 Products – Not Used

Part 3 Execution – Not Used

END OF SECTION

Part 1 General

1.01 Scope

- A. This Section includes testing which the Owner may require, beyond that testing required of the manufacturer, to determine if materials provided for the Project meet the requirements of these Specifications.
- B. This work also includes all testing required by the Owner to verify work performed by the Contractor is in accordance with the requirements of these Specifications, i.e., concrete strength and slump testing, soil compaction, etc.
- C. This work does not include materials testing required in various sections of these Specifications to be performed by the manufacturer, e.g., testing of pipe.
- D. The testing laboratory or laboratories will be selected by the Owner. The testing laboratory or laboratories will work for the Owner.

1.02 Payment for Testing Services

- A. The cost of testing services required by the Contract to be provided by the Contractor shall be paid for by the Owner through the CASH ALLOWANCE, i.e., concrete testing, soil compaction, and asphalt testing.
- B. The cost of additional testing services not specifically required in the Specifications, but requested by the Owner or Engineer, shall be paid for by the Owner through the CASH ALLOWANCE.
- C. The cost of material testing described in various sections of these Specifications or as required in referenced standards to be provided by a material manufacturer, shall be included in the price bid for that item and shall not be paid for by the Owner.
- D. The cost of retesting any item that fails to meet the requirements of these Specifications shall be paid for by the Contractor. Retesting shall be performed by the testing laboratory working for the Owner.

1.03 Laboratory Duties

- A. Cooperate with the Owner, 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.

Testing Laboratory Services

2. Ascertain compliance with requirements of the Contract Documents.
- D. Promptly notify the Engineer and Contractor of irregularities or deficiencies of work which are 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, provide access to work and/or comply with manufacturer's requirements.
- B. Provide to the laboratory, representative samples, in required quantities, of materials to be tested.
- C. Furnish copies of mill test reports.
- D. 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. Build or furnish a holding box for concrete cylinders or other samples as required by the laboratory.
- E. Notify the laboratory sufficiently in advance of operation to allow for the assignment of personnel and schedules of tests.
- 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

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

Promptly process and distribute all required copies of test reports and related instructions to insure all necessary retesting or replacement of materials with the least possible delay in the progress of the work.

1.07 Furnishing Materials

The Contractor shall be responsible for furnishing all materials necessary for testing.

1.08 Code Compliance Testing

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

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 Owner, 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 Owner.

1.11 Taking Specimens

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

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

END OF SECTION

Part 1 General

1.01 Scope

- A. Temporary facilities required for this work include, but are not necessarily limited to:
 - 1. Temporary utilities such as water and electricity.
 - 2. First aid facilities.
 - 3. Sanitary facilities.
 - 4. Potable water.
 - 5. Temporary enclosures and construction facilities.

1.02 General

- A. First aid facilities, sanitary facilities and potable water shall be available on the Project site on the first day that any activities are conducted on site. The other facilities shall be provided as the schedule of the Project warrants.
- B. Maintenance: Use all means necessary to maintain temporary facilities in proper and safe condition throughout progress of the work. In the event of loss or damage, immediately make all repairs and replacements necessary, at no additional cost to the Owner.
- C. Removal: Remove all such temporary facilities and controls as rapidly as progress of the work will permit.

1.03 Temporary Utilities

- A. General
 - 1. Provide and pay all costs for all water, electricity and other utilities required for the performance of the work.
 - 2. Pay all costs for temporary utilities until Project completion.
 - 3. Costs for temporary utilities shall include all power, water and the like necessary for testing equipment as required by the Contract Documents.
- B. Temporary Water: Provide all necessary temporary piping, back flow preventers, meters and upon completion of the work, remove all such temporary facilities. Provide and remove water meters.
- C. Temporary Electricity

Temporary Facilities

1. Provide all necessary wiring for the Contractor's use.
2. Furnish, locate and install area distribution boxes such that the individual trades may use, their own construction type extension cords to obtain adequate power, and artificial lighting at all points where required by inspectors and for safety.

1.04 First Aid Facilities

The Contractor shall provide a suitable first aid station, equipped with all facilities and medical supplies necessary to administer emergency first aid treatment. The Contractor shall have standing arrangements for the removal and hospital treatment of any injured person. All first aid facilities and emergency ambulance service shall be made available by the Contractor to the Owner and the Engineer's personnel.

1.05 Sanitary Facilities

Prior to starting the work, the Contractor shall furnish, for use of Contractor's personnel on the job, all necessary toilet facilities which shall be secluded from public observation. These facilities shall be either chemical toilets or shall be connected to the Owner's sanitary sewer system. All facilities, regardless of type, shall be kept in a clean and sanitary condition and shall comply with the requirements and regulations of the area in which the work is performed. Adequacy of these facilities will be subject to the Engineer's review and maintenance of same must be satisfactory to the Engineer at all times.

1.06 Potable Water

The Contractor shall be responsible for furnishing a supply of potable drinking water for employees, subcontractors, inspectors, engineers and the Owner who are associated with the work.

1.07 Enclosures and Construction Facilities

Furnish, install and maintain for the duration of construction, all required scaffolds, tarpaulins, canopies, steps, bridges, platforms and other temporary construction necessary for proper completion of the work in compliance with all pertinent safety and other regulations.

1.08 Parking Facilities

Parking facilities for the Contractor's and Contractor's subcontractors' personnel shall be the Contractor's responsibility. The storage and work facilities provided by the Owner will not be used for parking by the Contractor's or subcontractor's personnel.

1.09 Temporary Fencing

Furnish portable chain link fencing to enclose staging area and construction zone in

Heritage Landing. Enclosed area shall be sufficient to accommodate construction operations. Fencing shall be minimum 2-inch, 0.148-inch thick, galvanized steel, chain link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8" OD line posts and 2-7/8" OD corner and pull posts, with 1-5/8" OD top and bottom rails. Provide concrete or galvanized steel bases for supporting posts.

END OF SECTION

Part 1 General

1.01 Scope

- A. This Section covers furnishing, maintaining, and operating a temporary bypass pumping system during construction. The Contractor shall furnish all materials, labor, equipment, power, maintenance, etc., to implement a temporary pumping and control system for the purpose of diverting the existing flow around the work area.
- B. Design and installation of these systems shall be the Contractor's responsibility subject to Engineer's approval as specified.
- C. SSOs or other spills that occur during bypass operations shall be the responsibility of the Contractor. Fines levied by regulatory authorities as a result of the SSOs shall be paid by the Contractor.
- D. Cleanup of SSOs and other spills shall be the responsibility of the Contractor and shall be performed at no additional cost to the Owner.
- E. Use of turbidity curtains shall be used as necessary to contain debris during an SSO or a spill. Coordinate installation and maintenance of turbidity with regulatory authority.

1.02 General

The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The Contractor shall employ the services of a Specialty Contractor (Firm) who can demonstrate to the Engineer that it specializes in the design and operation of temporary bypass pumping systems. The Firm shall provide at least five references of projects of a similar size and complexity as this Project performed by his company within the past three years. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.

1.03 Submittals

- A. The Contractor shall prepare with the Firm a specific, detailed description of the proposed pumping system(s) required for each location and submit it along with the Firm's references within one month following Notice to Proceed. All materials required for the pumping system(s) shall be provided by the Firm.
- B. The Contractor shall submit detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flows in accordance with the submittal section. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, pump and drive control selection and design, materials and all other incidental items necessary and/or required to insure proper protection of the facilities.

Temporary Bypass Pumping

The Bypass Pumping Plan shall include but not be limited to details of the following:

1. Staging areas for pumps including construction details of mounting platform for setups that could be impacted by high water during rain event. Use of matting shall also be shown to protect turf beneath and around the setups and ingress/egress to the setup for refueling.
2. Sewer or structure plugging method and types of plugs.
3. Number, size, material, location and method of installation of suction piping.
4. Number, size, material, method of installation and location of installation of discharge piping.
5. Bypass pump sizes, capacity, and number of each size to be on site and power requirements.
6. Motor control package design, including wiring diagrams, voltage and amperage requirements, control logic description.
7. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted).
8. Standby power provisions, location, and spill prevention and control measures.
9. Thrust and restraint block sizes and locations if applicable.
10. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill.
11. Any temporary pipe supports and anchoring required.
12. Design plans and access provisions to bypass pumping and generator fueling locations indicated on the Drawings.
13. Calculations for selection of bypass pumping pipe size.
14. Schedule for installation and maintenance of bypass pumping lines.
15. Continuous monitoring, operating, emergency response plan and flood response plan.
16. Decibel level with sound attenuation.
17. Calculations to verify anticipated flow at each setup.
18. All other incidental items necessary and/or required to ensure facilities are properly protected including protecting the access and bypass pumping locations from damage due to the discharge flows and compliance with the requirements

and permit conditions specified in the Contract Documents.

Part 2 Products

2.01 Design and Performance Requirements

- A. Bypass pumping systems shall have sufficient capacity to pump from negligible flows to a minimum of 3,500 gpm from the 15-inch sewer and a minimum of 10,500 gpm (excluding flow from 15-inch sewer) from the 42-inch sewer. The Contractor shall provide all pumps of adequate size to handle the flow events and temporary piping to ensure that the total flow can be safely diverted around the work area.
- B. Contractor shall have redundant standby equipment available onsite and ready for immediate operation and use in the event of an emergency or breakdown.
- C. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
- D. 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.
- E. 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.
- F. The Contractor shall protect water resources wetlands and other natural resources.
- G. The Contractor shall provide standby power to all electric pumping units in the event of power loss.
- H. No discharge of sewage or debris shall be released to the environment. All overflow or bypass environmental cleanup activities shall be immediately commenced and performed continuously by the Contractor. Any associated fines or penalties enacted by the Tennessee Department of Environment and Conservation, the U.S. EPA, and/or any other regulatory groups will be borne solely by the Contractor.

2.02 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 handle low flow events for long periods of time to accommodate the cyclical nature of the wastewater plant flows.
- B. The Contractor shall provide the necessary stop/start and variable speed controls for each pump. The motor controls shall use a PLC based level control system with a submersible level transducer to initiate start and stop signals to the motor controls.

Temporary Bypass Pumping

- C. Discharge piping systems shall be constructed of restrained joint type piping. Joints shall allow no leakage. Standard aluminum irrigation piping is not acceptable.
- D. Pumps systems shall be flow tested and piping shall be pressure tested prior to use. Engineer shall be present during testing.
- E. The PLC shall monitor water level in manhole. A high water alarm condition shall be integrated with a telemetry system to alert the Contractor to system malfunctions or high liquid levels in manholes.
- F. Above-ground pumps and/or power units shall be located inside a temporary portable berm to contain any fuel or sewage that may spill during the normal course of operation.
- G. Under no circumstances will irrigation type piping or glued PVC pipe be allowed.
- H. A multiple pump header system shall have check valves to facilitate pump removal, service, and/or replacement while the system remains operational.
- I. All above ground pumps and/or power units shall be equipped with sound attenuation measures which shall include enclosures and/or sound curtains.
- J. Air Release Valves shall be installed on the pump header and at all high points along the bypass pipe.

Part 3 Execution

3.01 Field Quality Control and Maintenance

- A. The Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping prior to actual operation.
- B. The Contractor shall inspect the bypass pumping system every two hours to ensure that the system is working correctly.
- C. The Contractor shall ensure that the temporary pumping system is properly maintained and that a responsible operator shall be on hand at all times when pumps are operating.
- D. The Contractor shall submit a plan for the replacement of malfunctioning equipment.
- E. Spare parts for pumps and piping shall be kept on site as required.
- F. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

3.02 Installation and Operation

- A. The Contractor shall install the bypass pipelines to minimize any disturbance to

existing utilities and shall obtain approval of the pipeline locations from the Owner and the Engineer. Routing of bypass pipelines shall not impede pump station traffic flow.

- B. The Contractor shall protect the temporary pumping station and piping from damage during construction.
- C. Contractor shall provide all fuel and power for the temporary pumping facility. Contractor shall make arrangements for a power meter and pay all associated fees.
- D. Plugging shall incorporate a primary and secondary plugging device. When plugging is no longer needed for work performance, remove in a manner that permits the sewage flow to slowly return to normal to prevent surcharging.
- E. When bypass pipe crosses local streets and private driveways, direct burial in trenches with cover and temporary pavement may be used when it's not feasible to install flow ramps. Obtain approval from the Construction Manager prior to burial.
- F. Bypass pipelines shall be thoroughly flushed with clean water before dismantling. Discharge shall be into sanitary sewer. Coordinate water source with local utility.
- G. Bypass pumps shall be installed with secondary containment.
- H. Install HDPE traction mat on ground surface as directed by Owner to minimize damage to yard areas while pulling bypass pipe.
- I. Fuse cap on end of bypass pipe prior to pulling or winching pipe.
- J. Use small vehicles (maximum 1-ton pickup) for refueling pumps.
- K. Use HDPE traction mats to protect grass surfaces between paved roadways and bypass pump setup.
- L. Use of winches may be used to pull bypass pipe in areas with limited equipment access.
- M. Seal annular space between bypass pipe and receiving manhole to minimize release of odors and sewer gas to the maximum extent possible.

3.03 Cleanup

- A. Upon completion of the use, restore the project area affected by the setup and operations to a condition at least equal to that existing prior to the work.

END OF SECTION

Part 1 General

1.1 General

- A. Contractor shall provide all temporary construction roads, walks and parking areas required during construction and for use of emergency vehicles. Temporary roads and parking areas shall be maintained by the Contractor so as to be fully usable in all weather conditions.
- B. Contractor shall prevent interference with traffic on existing roads. He shall indemnify and save harmless the Owner from any expenses caused by Contractor's operations over these roads.
- C. Roadways damaged by Contractor shall be restored to their original condition by the Contractor subject to approval of the Engineer.
- D. Temporary roads, walks, and parking areas shall be removed by the Contractor prior to final acceptance and the ground returned to its original condition, unless otherwise required by the Contract Documents or the Engineer.

1.2 Traffic Controls

Comply with requirements of authorities having jurisdictions.

1.3 Contractor's Access to the Site

All access to the site for Contractor's employees, material, tools, and equipment shall only be through the designated construction entrances approved by the Engineer.

1.4 Designated Parking

No Contractor employee's personal vehicle shall be allowed to park anywhere other than the areas approved by the Owner. The Contractor shall prepare and maintain this area as required.

1.5 Maintenance of Roads

- A. Contractor shall at all times maintain approved access for trucks to loading areas of the construction site and parking facilities. All parking of construction vehicles shall be in approved parking areas.
- B. Contractor shall sweep all paved roads, daily if necessary, that are utilized in the prosecution of the Work.
- C. Contractor shall keep the above roads clean and serviceable at all times.
- D. Dust resulting from construction operations shall be controlled by the Contractor to prevent a nuisance on the site or in adjacent areas. Refer to Section 01 56 16, Dust Control.

END OF DOCUMENT

Part 1 General

1.01 Scope

Limit blowing dust caused by construction operations by applying water or employing other appropriate means or methods to maintain dust control, subject to the approval of the Owner. As a minimum, this may require the use of a water wagon twice a day to suppress dusty conditions.

1.02 Protection of Adjacent Property

- A. The Bidders shall visit the site and note the buildings, landscaping, roads, parking areas and other facilities near the work site that may be damaged by their operations. The Contractor shall make adequate provision to fully protect the surrounding area and will be held fully responsible for all damages resulting from Contractor's operations.
- B. Protect all existing facilities (indoors or out) from damage by dust, fumes, spray or spills (indoors or out). Protect motors, bearings, electrical gear, instrumentation and building or other surfaces from dirt, dust, welding fumes, paint spray, spills or droppings causing wear, corrosion, malfunction, failure or defacement by enclosure, sprinkling or other dust palliatives, masking and covering, exhausting or containment.

END OF SECTION

Part 1 General

1.01 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.

- 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 not cease until the Project has been accepted by the Owner.

END OF SECTION

Part 1 General

1.01 Scope

- A. The work specified in this Section consists of providing and maintaining temporary and permanent erosion and sedimentation controls as shown on the Drawings. This Section also specifies the subsequent removal of temporary erosion and sedimentation controls.
- B. Temporary and permanent erosion and sedimentation controls include grassing and mulching of disturbed areas and structural barriers at those locations which will ensure that erosion during construction will be maintained within acceptable limits. Acceptable limits are as established by the Tennessee Water Quality Control Act of 1977, as amended, Section 402 of the Federal Clean Water Act, and applicable codes, ordinances, rules, regulations and laws of local and municipal authorities having jurisdiction. For installation and maintenance guidance, refer to the Tennessee Erosion and Sediment Control Handbook, latest edition.
- C. Land disturbance activity shall not commence until the Land Disturbance Permit and all required stream crossing permits have been issued.
- D. Land disturbance permit shall be obtained and paid for by the Contractor.

1.02 Submittals

- A. Submit product data in accordance with the requirements of Section 01 33 23 of these Specifications.
- B. Prior to any construction activity, the Contractor shall submit, for the Engineer's approval, a schedule for the accomplishment of temporary and permanent erosion and sedimentation control work. No work shall be started until the erosion and sedimentation control schedule and methods of operation have been approved by the Engineer.

1.03 Quality Assurance

- A. The temporary and permanent erosion and sedimentation control measures shown on the Drawings are minimum requirements. Any additional erosion and sedimentation control measures required by the Contractor's means, methods, techniques and sequence of operation will be installed by the Contractor at no additional cost to the Owner.
- B. Perform all work under this Section in accordance with all pertinent rules and regulations including, but not necessarily limited to, those stated in these Specifications. Where provisions of pertinent rules and regulations conflict with these Specifications, the more stringent provisions shall govern.

Erosion and Sedimentation Control

- C. Provide all materials and promptly take all actions necessary to achieve effective erosion and sedimentation control in accordance with the Tennessee Water Quality Control Act of 1977, as amended, local ordinances, other permits, local enforcing agency guidelines and these Specifications.
- D. Basic Principles
1. Coordinate the land disturbance activities to fit the topography, soil types and conditions.
 2. Minimize the disturbed area and the duration of exposure to erosive elements.
 3. Provide temporary or permanent stabilization to disturbed areas immediately after rough grading is complete.
 4. Safely convey run-off from the site to a stable outlet to prevent flooding and damage to downstream facilities resulting from increased runoff from the site.
 5. Retain sediment on-site that was generated on-site.
 6. Minimize encroachment upon watercourses.
- E. Implementation
1. The Contractor is solely responsible for the control of erosion within the Project site and the prevention of sedimentation from leaving the Project site or entering waterways.
 2. The Contractor shall install temporary and permanent erosion and sedimentation controls which will ensure that runoff from the disturbed area of the Project site shall pass through a filter system before exiting the Project site.
 3. The Contractor shall provide temporary and permanent erosion and sedimentation control measures to prevent silt and sediment from entering the waterways. The Contractor will obtain a Land Disturbance Permit that allows encroachments on the 60 foot vegetative buffer in specific areas. The Contractor shall exercise extreme care during land disturbance operations within the 60 foot vegetative buffer to prevent degradation of the stream.
 4. The Contractor shall limit land disturbance activity to those areas shown on the Drawings.
 5. The Contractor shall maintain erosion and sedimentation control measures within disturbed areas on the entire site at no additional cost to the Owner until the acceptance of the Project. Maintenance shall include mulching, re-seeding, clean-out of sediment barriers and sediment ponds, replacement of washed-out or undermined rip rap and erosion control materials, to the satisfaction of the Engineer.

6. All fines imposed for improper erosion and sedimentation control shall be paid by the Contractor.
7. The Contractor shall use all means necessary to control dust on and near the work and all off-site borrow areas, in accordance to the Tennessee Erosion and Sediment Control Handbook, latest edition. The Contractor should thoroughly moisten all surfaces as required to prevent dust from being a nuisance to the public, neighbors and concurrent performance of work on the site.

Part 2 Products

2.01 Sediment Barriers

A. Silt Fence

1. Type A silt fence shall meet the requirements of Tennessee Erosion and Sediment Control Handbook, latest edition. Posts shall be 4 feet in length and can either be made of steel, soft wood or oak. Steel posts shall be 1.3lb./ft. minimum. Soft wood post shall be 3" diameter or 2" x 4". Oak posts shall be 1.5" x 1.5". Fasteners for wood posts shall be wire staples or nails. Wire staples are to have a minimum 17 gauge, 3/4" crown width, and a 1/2" leg length. Nails are to have a minimum 14 gauge, 3/4" button head, and a 1" length.
2. Type C silt fence is a combination of Type A silt fence fabric with woven wire reinforcement. Type C silt fence woven wire reinforcement shall meet the requirements of Tennessee Erosion and Sediment Control Handbook, latest edition. Posts shall be 4 feet in length and shall be made of steel. Steel posts shall be 1.3lb./ft. minimum.
3. Silt fence fabric shall meet the requirements of the Tennessee Erosion and Sediment Control Handbook, latest edition.

2.02 Storm Drain Inlet Protection

- A. Silt Fence Inlet Protection: Type C Silt fence supported by steel posts shall be used. See Silt Fence this Part.
- B. Baffle Box Inlet Protection:
 1. Shall be constructed of 2" x 4" boards spaced a maximum of 1 inch apart or of plywood with weep holes 2 inches in diameter.
 2. Gravel: 1/2 to 3/4 inch gravel (#57 washed stone).
 3. Type C filter fabric wrapping: See Silt Fence this Part.
- C. Block and Gravel Inlet Protection

Erosion and Sedimentation Control

1. Concrete Masonry Block.
 2. Gravel: 1/2 to 3/4 inch gravel (#57 washed stone).
 3. Hardware cloth or comparable wire mesh with 1/2 inch openings.
- D. Gravel Drop Protection
1. Gravel: 1/2 to 3/4 inch gravel (#57 washed stone).
- E. Sod Inlet Protection
1. 1' wide strips of sod. See Section 02934 for correct placement and planting schedules.

2.03 Check Dams

- A. Stone Check Dams
1. Stone check dams shall be constructed of graded size 2-10 inch stone.
 2. The geotextile shall be in accordance with AASHTO M288 Section 7.3, Separation Requirements, Table 3.
- B. Rock Check Dams
1. Stone sizing: The stone size shall be determined by the design criteria established in the Rip Rap section - Tennessee Erosion and Sediment Control Handbook, latest edition. The rock dam can be faced with smaller stone on the upstream side for additional filtering effect.
 2. Geotextile: 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 Section 7.5, Permanent Erosion Control Recommendations.

2.04 Construction Exit

- A. Stone: Use sound, tough, durable stone resistant to the action of air and water. Slabby or shaley pieces will not be acceptable. Aggregate size shall be TDOT #1 or #2 stone (1.5 to 3.5-inch stone).
- B. Geotextile: The geotextile underliner must be placed the full length and width of the entrance. Geotextile selection shall be based on AASHTO M288-98 specification:
1. For subgrades with a CBR greater than or equal to 3 or shear strength greater than 90 kPa, geotextile must meet requirements of section AASHTO M288 Section 7.3, Separation Requirements.

2. For subgrades with a CBR between 1 and 3 or shear strength between 30 and 90 kPa, geotextile must meet requirements of AASHTO M288 Section 7.4, Stabilization Requirements.

2.05 Rip Rap

- A. Stone Rip Rap: Use sound, tough, durable stones resistant to the action of air and water. Slabby or shaley pieces will not be acceptable. Sizes are shown in the Drawings for each design requiring rip rap construction. The following classifications shall be used in the construction of slope or channels as shown on the Drawings:
 1. Graded Rip Rap - durable, dense, specifically selected and graded, quarried stone, placed to prevent erosion. Sizes shall be in accordance to the Tennessee Erosion and Sediment Control Handbook, latest edition.
 2. Filter Bedding Stone - stone generally less than 6 inches in size, that may be placed under graded rip rap stone in a layer or combination of layers, designed and installed in such a manner as to prevent loss of underlying soil or finer materials because of moving water. Sizes shall be in accordance to the Tennessee Erosion and Sediment Control Handbook, latest edition.
 3. Surge Stone - a quarry run ungraded, unscreened material which may or may not have fines.

2.06 Gabions

- A. Gabions shall be large, multi-celled, rectangular wire mesh boxes filled with 4 to 8-inch size pieces of stone to prevent erosion, scour or sloughing of an embankment. Gabions shall have the following features:
 1. Hexagonal mesh pattern, which under stress will deform but not break.
 2. Triple twist, which will make the mesh non-raveling.
 3. Reinforcing wires woven into each corner, which will increase the strength at the stress points and help the gabion retain its shape during and after filling.
 4. A diaphragm securely attached to the base, which will prevent the shifting of the stone and at the same time, reinforce the gabion.
- B. The wire mesh shall have an opening of approximately 3 x 4-inches and shall be a minimum 12 gauge. Wire mesh shall be galvanized.
- C. Gabion baskets shall be 12 feet long x 3 feet high with four cells.
- D. Geotextile: Geotextiles shall be used behind all gabion structures. Geotextiles shall be in accordance with AASHTO M288 Section 7.5, Permanent Erosion Control Requirements.

2.07 Polyacrylamide (PAM)

- A. Polyacrylamide (PAM) additives are permissible as a supplement to existing Best Management Practices and are not to be relied on as the only method for erosion control.
- B. If the Contractor intends to use PAM additives, they shall provide adequate documentation and testing to show the polymer type and dosing has been matched to the soil type found in the work area. Testing and documentation shall be prepared by the manufacturer of the polymer or other licensed soil professional.
- C. PAM products include, but are not limited to, additives to the soil, hydro-seeder, treated mat, treated checks dams, bars or logs. Due to the different nature of products, manufacturer's directions shall be provided to the Engineer prior to their use. Toxicology reports shall be supplied with all submittal data prior to use.
- D. PAM products shall conform to the following guidelines:
 - 1. Only the anionic form of PAM shall be used. Cationic PAM is toxic and shall NOT be used.
 - 2. PAM and PAM mixtures shall be environmentally benign, harmless to fish, wildlife, and plants. PAM and PAM mixtures shall be noncombustible.
 - 3. Anionic PAM, in pure form, shall have less than or equal to 0.05% acrylamide monomer by weight, as established by the Food and Drug Administration and the Environmental Protection Agency.
 - 4. To maintain less than or equal to 0.05% of acrylamide monomer, the maximum application rate of PAM, in pure form, shall not exceed 200 pounds/acre/year. Do not over apply PAM. Excessive application of PAM can lower infiltration rate or suspend solids in water, rather than promoting settling.
 - 5. Users of anionic PAM shall obtain and follow all Material Safety Data Sheet requirements and manufacturer's recommendations.
 - 6. Additives such as fertilizers, solubility promoters or inhibitors, etc. to PAM shall be non-toxic.
 - 7. The manufacturer or supplier shall provide written application methods for PAM and PAM mixtures. The application method shall insure uniform coverage to the target and avoid drift to non-target areas including waters of the state. The manufacturer or supplier shall also provide written instructions to insure proper safety, storage, and mixing of the product.
 - 8. Gel bars or logs of anionic PAM mixtures may be used in ditch systems. This application shall meet the same testing requirement as anionic PAM emulsions and powders.

9. To prevent exceeding the acrylamide monomer limit in the event of a spill, the anionic PAM in pure form shall not exceed 200 pounds/batch at 0.05% acrylamide monomer (AMD) or 400 pounds/batch at 0.025% AMD.

2.08 Erosion Control Matting and Blankets

- A. All blanket and matting materials shall be in accordance to the Tennessee Erosion and Sediment Control Handbook, latest edition.
- B. Temporary Erosion Control Blankets: Use in concentrated flow areas, all slopes steeper than 3:1 and with a height of ten feet or greater, and cuts and fills within stream buffers, shall be stabilized with the appropriate erosion control matting or blankets.
 1. Straw blankets: Shall consist of weed-free straw from agricultural crops formed into a blanket. Blankets shall have a top side of photodegradable plastic mesh with a maximum mesh size of 5/16 x 5/16 inch sewn to the straw with biodegradable thread that is appropriate for slopes. The blanket shall have a minimum thickness of 3/8 inch and minimum dry weight of 0.5 pounds per square yard.
 2. Excelsior blankets: Shall consist of curled wood excelsior (80% of fibers are six inches or longer) formed into a blanket. The blanket shall have clear markings indicating the top side of the blanket and be smolder resistant. Blankets shall have photodegradable plastic mesh having a maximum mesh size of 1- 1/2½ x 3 inches. The blanket shall have a minimum thickness of 1/4 of an inch and a minimum dry weight of 0.8 pounds per square yard. Slopes require excelsior matting with the top side of the blanket covered in the plastic mesh, and for waterways, both sides of the blanket require plastic mesh.
 3. Coconut fiber blankets: Shall consist of 100% coconut fiber formed into a blanket. The minimum thickness of the blanket shall be 1/4 of an inch with a minimum dry weight of 0.5 pounds per square yard. Blankets shall have photodegradable plastic mesh, with a maximum mesh size of 5/8 x 5/8 inch and sewn to the fiber with a breakdown resistant synthetic yarn. Plastic mesh is required on both sides of the blanket if used in waterways. A maximum of two inches is allowable for the stitch pattern and row spacing.
 4. Wood fiber blankets: Shall consist of reprocessed wood fibers that does not possess or contain any growth or germination inhibiting factors. The blanket shall have a photodegradable plastic mesh, with a maximum mesh size of 5/8 x 3/4 inch, securely bonded to the top of the mat. The blanket shall have a minimum dry weight of 0.35 pounds per square yard. A maximum of two inches is allowable for the stitch pattern and row spacing. This practice shall be applied only to slopes.
 5. Jute Mesh: To be applied to slopes. Jute mesh with a 48 inch width shall show between 76 and 80 warpings and a one yard length shall show between 39 to 43 weftings. The woven mesh shall be at least 45 inches wide. Yarn shall have a

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unit weight of at least 0.9 pounds per square yard, but not more than 1.5 pounds per square yard.

- C. Permanent Matting: Use in concentrated flow areas, all slopes steeper than 3:1 and with a height of ten feet or greater, and cuts and fills within stream buffers, shall be stabilized with the appropriate erosion control matting or blankets.

1. Permanent matting shall consist of a lofty web of mechanically 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, bi-axially oriented nets bound securely together by parallel lock stitching with polyolefin, nylon or polyester threads are all appropriate bonding methods. Mats shall maintain their shape 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.
2. The mat shall conform to the following physical properties:

Property	Minimum Value
Thickness	0.5 inch
Weight	0.6 PSY
Roll Width	38 inches
Tensile Strength	
Length (50% elongation)	15 lbs./in.
Length (ultimate)	20 lbs./in.
Width (50% elongation)	5 lbs./in.
Width (ultimate)	10 lbs./in.
(ASTM D 1682-6" strip)	
Ultraviolet Stability	80%
(1,000 hrs. in an Atlas ARC Weatherometer, ASTM G 23, Type D in accordance with ASTM D 822)	

- D. Stapling and Anchoring Materials:

1. Temporary 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.
2. 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 length with a 2 inch crown.

2.09 Channel Stabilization

- A. Vegetated Lining: Vegetated lining shall be designed to resist erosion when the channel is flowing at the 25-year frequency discharge. Temporary erosion control blankets or sod shall be used on all channels and concentrated flow areas to aid in the establishment of the vegetated lining. If a vegetated lining is desired in a channel with velocities between 5- 10 ft./sec., permanent soil reinforcement matting shall be used.
- B. Rock Rip- Rap Lining: Rock rip rap shall be designed to resist displacement when the channel is flowing at the 25-year frequency discharge. Rock rip rap lining should be used when channel velocities are between 5 and 10 ft./sec.
- C. Concrete Lining
 - 1. Concrete shall be constructed in accordance with the plan and details in the Drawings.
 - 2. A separation geotextile should be placed under concrete linings to prevent undermining in the event of stress cracks due to settlement of the base material. Geotextiles shall be in accordance with AASHTO M288 Section 7.5, Permanent Erosion Control Requirements.

2.10 Downdrain Structures

- A. Temporary Downdrain:
 - 1. Pipe: Design the slope drain using heavy-duty, flexible materials such as non-perforated, corrugated plastic pipe or specially designed flexible tubing. Use reinforced, hold-down grommets or stakes to anchor the pipe at intervals not to exceed 10 feet with the outlet end securely fastened in place. The pipe must extend beyond the toe of the slope.
 - 2. Filter Ring: A stone filter ring shall be placed at the inlet for added sediment filtering capacity.
 - 3. Storm Drain Outlet Protection: Rock rip rap shall be placed at the outlet for energy dissipation. A Tee outlet, flared end section, or other suitable device may be used in conjunction with the rip rap for additional protection.
- B. Permanent Downdrain:
 - 1. Pipe: Design the slope drain using heavy-duty, flexible materials such as non-perforated, corrugated plastic or steel pipe or specially designed flexible tubing. Use reinforced, hold-down grommets or stakes to anchor the pipe at intervals not to exceed 10 feet with the outlet end securely fastened in place. The pipe must extend beyond the toe of the slope.

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2. **Paved Flume:** The paved flume may have a parabolic, rectangular or trapezoidal cross-section and shall consist of reinforced concrete or asphalt paving.
3. **Filter Ring:** A stone filter ring shall be placed at the inlet for added sediment filtering capacity.
4. **Storm Drain Outlet Protection:** Rock rip rap shall be placed at the outlet for energy dissipation. A Tee outlet, flared end section, or other suitable device may be used in conjunction with the rip rap for additional protection.

2.11 Filter Ring**A. Stone sizing:**

1. When utilized at inlets with diameters less than 12 inches, the filter ring shall be constructed of TDOT Class A-3 stone no smaller than 2-6 inches (15 - 30 lbs.).
2. When utilized at pipes with diameters greater than 12 inches, the filter ring shall be constructed of TDOT Class A-1 stone no smaller than 2-15 inches (50 - 100 lbs.).
3. For added sediment filtering capabilities the upstream side of the rip- rap can be faced with TDOT #57 stone, minimum stone size of $\frac{3}{4}$ inch.

2.12 Temporary Sediment Basin

Temporary Sediment Basins shall be constructed in accordance with the plan and details shown in the Drawings.

2.13 Temporary Stream Crossing

Temporary Stream Crossing shall be constructed in accordance with the plan and details shown in the Drawings. Temporary crossings shall not be used on streams with drainage areas greater than one square mile and shall be a constructed as a culvert crossing, as shown in the Drawings.

2.14 Storm Drain Outlet Protection

- A. **Stone size:** Stone size as indicated for each outlet in the Storm Drain Outlet Protection detail shown in the Drawings.
- B. **Geotextile:** 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.
- C. **Stone quality:** Select stone for riprap rip rap from field stone or quarry stone. The

stone should be hard, angular, and highly weather-resistant. The specific gravity of the individual stones should be at least 2.5.

2.15 Gradient Treatment

- A. Contour Furrow: Contour furrows may be used for slopes which are 3:1 (H:V) or less..
- B. Serrated Slope: A serrated slope may be used for slopes which are 2:1 (H:V) or less.
- C. Stepped Slope: Graded areas steeper than 3:1 (H:V), which will not be mowed, should preferably have a stepped slope.
- D. Terraced Slope: Should be used on most slopes which are longer than those allowed for other methods.

2.16 Temporary Mulching

- A. Dry straw or hay: Shall be applied at a depth of 2 to 4 inches providing complete soil coverage. Material shall be clean, seed-free cereal hay or straw.
- B. Wood waste (chips, sawdust or bark): Shall be applied at a depth of 2 to 3 inches. Organic material from the clearing stage of development should remain on site, be chipped, and applied as mulch.
- C. Mulch Binder: Mulch on slopes exceeding 3 (horizontal) to 1 (vertical) shall be held in place by the use of a mulch binder, as approved by the Engineer. The mulch binder shall be non toxic to plant and animal life and shall be approved by the Engineer.

2.17 Temporary Grassing

- A. Grassing materials shall meet the requirements of the Tennessee Erosion and Sediment Control Handbook, latest edition, section that includes "Disturbed Area Stabilization (With Temporary Vegetation)".
- B. Seed rate, fertilization, lime application and other requirements shall be provided as shown on the Drawings.
- C. Water: Water shall be free of excess and harmful chemicals, organisms and substances which may be harmful to plant growth or obnoxious to traffic. Salt or brackish water shall not be used. Water shall be furnished by the Contractor.

2.18 Permanent Grassing and Sodding

As specified elsewhere in these Specifications.

2.19 Turbidity Curtain

- A. Barriers shall be a bright color (yellow or "international" orange are recommended) that

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will attract the attention of nearby boaters.

- B. The curtain fabric shall meet the following minimum requirements:

PHYSICAL PROPERTY	REQUIREMENT
THICKNESS, MILS	45
WEIGHT/OZ.SQ.YD:	
TYPE I	18
TYPE II	18 OR 22
TYPE III	22
GRAB TENSILE STRENGTH, LBS.	300
UV INHIBITOR	MUST BE INCLUDED

- C. Seams in the fabric shall be vulcanized, welded, or sewn, and shall develop the full strength of the fabric.
- D. Flotation devices shall be flexible, buoyant units, contained in an individual flotation sleeve or collar attached to the curtain. Buoyancy provided by the flotation units shall be sufficient to support the weight of the curtain and maintain a freeboard of at least 3 inches above the water surface.
- E. Load lines shall be fabricated into the bottom of all floating turbidity curtains. When installing in moving waters, load lines shall also be fabricated into the top of the fabric. The top load line shall consist of woven webbing or vinyl-sheathed steel cable, and shall have a break strength in excess of 10,000 pounds. The supplemental (bottom) load line shall consist of a chain incorporated into the bottom hem of the curtain, with sufficient weight to serve as ballast to hold the curtain in a vertical position. Additional anchorage shall be provided as necessary. The load lines shall have suitable connecting devices which develop the full breaking strength for connecting to load lines in adjacent sections for calm water installation.
- F. External anchors may consist of wooden or metal stakes (2- x 4-inch or 2.5-inch minimum diameter wood, or 1.33 pounds/linear foot steel) when installing in calm waters; when installing in moving waters, bottom anchors must be used.
- G. Bottom anchors shall be sufficient to hold the curtain in the same position relative to the bottom of the watercourse, without interfering with the action of the curtain. The anchor may dig into the bottom (grappling hook, plow or fluke-type), or may be weighted (mushroom type), and shall be attached to a floating anchor buoy via an anchor line. The anchor line shall run from the buoy to the top load line of the curtain. When installing in moving waters, these lines shall contain enough slack to allow the buoy and curtain to float freely with tidal changes without pulling the buoy or curtain down, and shall be checked regularly to make sure they do not become entangled with debris. As previously noted, anchor spacing will vary with current velocity and potential wind and wave action; manufacturer's recommendations should be followed.

2.20 Sediment Traps

- A. The area under the embankment should be cleared, grubbed, and stripped of any vegetation and root mat.
- B. Fill material for the embankment should be free of roots or other woody vegetation, organic material, large stones, and other objectionable material.

Part 3 Execution

3.01 General

- A. Temporary and permanent erosion and sedimentation control measures shall prevent erosion and prevent sediment from exiting the site. If, in the opinion of the Engineer, the Contractor's temporary erosion and sedimentation control measures are inadequate, the Contractor shall provide additional maintenance for existing measures or additional devices to control erosion and sedimentation on the site at no additional cost to the Owner.
- B. All erosion and sedimentation control devices and structures shall be inspected by the Qualified Personnel as defined in Section 01 57 23 of the Specifications at least once a week and within 24 hours of the end of a storm that is 0.5 inches or greater. Any device or structure found to be damaged will be repaired or replaced by the end of the day.
- C. All erosion and sedimentation control measures and devices shall be constructed and maintained as indicated on the Drawings or specified herein until adequate permanent disturbed area stabilization has been provided and accepted by the Engineer. Once adequate permanent stabilization has been provided and accepted by the Engineer, all temporary erosion and sedimentation control structures and devices shall be removed.

3.02 Installation and Maintenance of Erosion and Sediment Controls

- A. Sediment Barriers
 - 1. Sediment barriers shall include, but are not necessarily limited to silt fences and any device which prevents sediment from exiting the disturbed area.
 - 2. Sediment barriers shall not be used in any flowing stream, creek or river.
 - 3. Sediment barriers shall be installed as shown on the Drawings and as directed by the Engineer.
 - 4. Along stream buffers and other sensitive areas, two rows of Type C silt fence or one row of Type C silt fence backed by hay bales shall be used.
 - 5. Sediment barriers shall be maintained to ensure the depth of impounded sediment is no more than one-half of the original height of the barrier or as

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directed by the Engineer. Torn, damaged, destroyed or washed-out barriers shall be repaired, reinforced or replaced with new material and installed as shown on the Drawings and as directed by the Engineer.

6. Sediment Barrier Removal

- a. Sediment barrier shall be removed once the disturbed area has been stabilized with a permanent vegetative cover and the sediment barrier is no longer required as directed by the Engineer.
- b. Accumulated sediment shall be removed from the barrier and spread over the site.
- c. All non-biodegradable parts of the barrier shall be disposed of properly.
- d. The disturbed area created by barrier removal shall be permanently stabilized.

B. Storm Drain Inlet Protection

1. Inlet Sediment Traps shall include, but are not necessarily limited to, Silt Fence Inlet Protection, Baffle Box, Block and Gravel Inlet Protection, Gravel Inlet Protection, Sod Inlet Protection and any device which traps sediment and prevents it from exiting the disturbed area.
2. Inlet Sediment Traps shall be installed as shown on the Drawings and as directed by the Engineer.
3. For each Inlet Sediment Traps type the following installation guidelines shall be used:
 - a. Silt Fence Inlet Protection: Type C silt fence supported by steel posts shall be used. The 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 and wire shall be securely fastened to the posts, and fabric ends must be overlapped a minimum of 18 inches or wrapped together around a post to provide a continuous fabric barrier around the inlet.
 - b. Baffle Box: The baffle box shall be constructed of 2" x 4" boards spaced a maximum of 1 inch apart or of plywood with weep holes 2 inches in diameter. The weep holes shall be placed approximately 6 inches on center vertically and horizontally. Gravel shall be placed outside the box, all around the inlet, to a depth of 2 to 4 inches. The entire box is wrapped in Type C filter fabric that shall be entrenched 12 inches and backfilled.
 - c. Block and Gravel Inlet Protection: One block is placed on each side of the structure on its side in the bottom row to allow pool drainage. The

foundation should be excavated at least 2 inches below the crest of the storm drain. The bottom row of blocks are is placed against the edge of the storm drain for lateral support and to avoid washouts when overflow occurs. If needed, lateral support may be given to subsequent rows by placing 2" x 4" wood studs through block openings. Hardware cloth or comparable wire mesh with 1/2 inch openings shall be fitted over all block openings to hold gravel in place. Clean gravel should be placed 2 inches below the top of the block on a 2:1 slope or flatter and smoothed to an even grade.

- d. Gravel Inlet Protection: Stone and gravel are used to trap sediment. The slope toward the inlet shall be no steeper than 3:1. A minimum 1 foot wide level stone area shall be left between the structure and around the inlet to prevent gravel from entering the inlet. On the slope toward the inlet, stone 3 inches in diameter and larger should be used. On the slope away from the inlet, 1/2 to 3/4 inch gravel (#57 washed stone) should be used at a minimum thickness of 1 foot.
 - e. Sod Inlet Protection: 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.
5. The trap shall be inspected daily and after each rain and repairs made as needed. Sediment shall be removed when the sediment has accumulated to one-half the height of the trap. Sediment shall be removed from curb inlet protection immediately. For excavated inlet sediment traps, sediment shall be removed when one-half of the sediment storage capacity has been lost to sediment accumulation. Sod inlet protection shall be maintained as specified for Permanent Sodding.
 6. Sediment Barrier Removal
 - a. Sediment barrier shall be removed once the disturbed area has been stabilized with a permanent vegetative cover and the sediment barrier is no longer required as directed by the Engineer.
 - b. Accumulated sediment shall be removed from the barrier and removed from the site.
 - c. All non-biodegradable parts of the barrier shall be disposed of properly.
 - d. The disturbed area created by barrier removal shall be permanently stabilized.

C. Check and Rock Dams

1. Check and rock dams shall not be used in any flowing stream, creek or river.
2. Check and rock dams shall be installed as shown on the Drawings and as

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directed by the Engineer.

3. Stone check dams: Mechanical or hand placement shall be required to insure complete coverage of entire width of ditch or swale and that center of dam is lower than edges.
4. Rock dams: Mechanical or hand placement will be required to insure that the rock dam extends completely across the channel and securely ties into both channel banks. The center of the dam must be no less than six inches lower than the lowest side, to serve as a type of weir. Gabions can be installed to serve as rock filter dams, but should follow recommended sizing and installation specifications. Refer to Gabions in this specification.
5. Height: The center of the check dam must be at least 9 inches lower than outer edges. Dam height should be 2 feet maximum measured to center of check dam.
6. Side Slopes: Side slopes shall be 2:1 or flatter.
7. Spacing: Two or more check dams in series shall be used for drainage areas greater than one acre. Maximum spacing between dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.
8. A geotextile should be used as a separator between the graded stone and the soil base and abutments. The geotextile shall be placed immediately adjacent to the subgrade without any voids and extend five feet beyond the downstream toe of the dam to prevent scour.
9. Check and rock dams shall be maintained to ensure the depth of impounded sediment is no more than one-half of the original height of the check dam or as directed by the Engineer. Damaged, destroyed or washed-out check dams shall be repaired, reinforced or replaced with new material and installed as shown on the Drawings and as directed by the Engineer.
10. Check and Rock Dams removal
 - a. Check and rock dams shall be removed [shall remain] once the disturbed area has been stabilized with a permanent vegetative cover and the sediment barrier is no longer required as directed by the Engineer.
 - b. Accumulated sediment shall be removed from the check and rock dams when it reaches a depth of one-half of the original height of the dam and removed from the site.
 - c. All non-biodegradable parts of the barrier shall be disposed of properly.
 - d. The disturbed area created by check or rock dam removal shall be permanently stabilized.

D. Construction Exit

1. Construction exit(s) shall be placed as shown on the Drawings and as directed by the Engineer. A construction exit shall be located at any point traffic will be leaving a disturbed area to a public right-of-way, street, alley, sidewalk or parking area.
2. Placement of Construction Exit Material: The ground surface upon which the construction exit material is to be placed shall be prepared to a smooth condition free from obstructions, depressions or debris. The geotextile underliner shall be placed to provide a minimum number of overlaps and a minimum width of one foot of overlap at each joint. The stone shall be placed with its top elevation conforming to the surrounding roadway elevations. The stone shall be dropped no more than three feet during construction.
3. Construction Exit Maintenance: The Contractor shall regularly maintain the exit with the top dressing of stone to prevent tracking or flow of soil onto public rights-of-way and paved surfaces as directed by the Engineer. This shall require periodic top dressing with 1.5-3.5 inch stone, as conditions demand.
4. Construction Exit Removal: Construction exit(s) shall be removed and properly disposed of when the disturbed area has been properly stabilized, the tracking or flow of soil onto public rights-of-way or paved surfaces has ceased and as directed by the Engineer.

E. Rip Rap

1. Rip rap shall be placed as shown on the Drawings and as directed by the Engineer. Rip rap shall be placed at all points where natural vegetation is disturbed on the banks of streams or drainage ditches. Compact backfill and place rip rap to prevent subsequent settlement and erosion. This requirement applies equally to construction along side a stream or drainage ditch as well as crossing a stream or drainage ditch.
2. When trenching across a stream or drainage ditch, place rip rap over the entire disturbed area upstream and downstream of the trench excavation. Place rip rap across creek bottom, across creek banks and extend rip rap placement five feet beyond the top of each creek bank.
3. Preparation of Foundations: The ground surface upon which the rip rap is to be placed shall be brought to the correct lines and grades before placement is commenced. Where filling of depressions is required, the new material shall be compacted with hand or mechanical tampers. Unless at creek banks or otherwise shown or specified, rip rap shall begin in a toe ditch constructed in original ground around the toe of the fill or the cut slope. The toe ditch shall be two feet deep in original ground, and the side next to the fill or cut shall have that same slope. After the rip rap is placed, the toe ditch shall be backfilled and the excess dirt spread neatly within the construction easement or on the site.

4. Placement of Plastic Filter Fabric
 - a. Plastic filter fabric shall be placed under all rip rap unless shown or specified otherwise.
 - b. Filter fabric shall not be placed under rip rap on stream or drainage ditch crossings.
 - c. The surface to receive filter fabric shall be prepared to a smooth condition free from obstructions, depressions and debris. The filter fabric shall be installed with the long dimension running up the slope and shall be placed to provide a minimum number of overlaps. The fabric shall be placed to provide a minimum width of one foot of overlap at each joint. The fabric shall be placed so that the upstream strip overlaps the downstream strip. The fabric shall be anchored in place with securing pins of the type recommended by the fabric manufacturer. Pins shall be placed on or within 3-inches of the centerline of the overlap. The fabric shall be placed loosely to avoid stretching and tearing during placement of the stone. The fabric shall be protected at all times during construction from clogging due to clay, silts, chemicals or other contaminants. Contaminated fabric or fabric damaged during installation or during placement of rip rap shall be removed and replaced with uncontaminated and undamaged fabric at no additional cost to the Owner.
5. Placement of Rip Rap: Rip rap shall be placed on a 6-inch layer of soil, crushed stone or sand overlaying the filter fabric. Rip rap shall be placed with its top elevation conforming with the finished grade or the natural existing slope of the stream bank and stream bottom. The stone shall be dropped no more than three feet during construction.
 - a. Stone Rip Rap: Stone rip rap shall be placed to provide a uniform surface to the thickness shown on the Drawings. The thickness tolerance for the course shall be -3-inches and +6-inches.

F. Gabions

1. Where, in the opinion of the Engineer, the slope of the banks of the stream is too steep to support rip rap, gabions shall be provided, in lieu of rip rap.
2. Gabions shall be assembled according to the manufacturer's recommendations. Laterally adjoining gabions shall be wired together by vertical edges. Vertically adjoining gabions shall be wired together along the front and back edges. Rip rap size for gabion construction shall be large enough not to fall out of gabions, but small enough to form three layers. Gabions shall be placed over a 6-inch layer of soil, crushed stone or sand overlaying a filter fabric.

G. Polyacrylamide (PAM)

1. Application rates shall conform to manufacturer's guidelines for application.
2. Maintenance will consist of reapplying anionic PAM to disturbed areas including high use traffic areas which interfere in the performance of this practice.

H. Erosion Control Matting and Blankets

1. Erosion Control Matting and Blankets be placed as shown on the Drawings and as directed by the Engineer.
2. 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.
3. Follow manufacturer's recommendations and follow details as shown on the Drawings for laying and stapling.
4. All erosion control blankets and matting should be inspected periodically following installation, particularly after rainstorms to check for erosion and undermining. Any dislocation or failure should be repaired immediately. If washouts or breakage occurs, reinstall the material after repairing damage to the slope or ditch. Continue to monitor these areas until they become permanently stabilized.

I. Channel Stabilization

1. Where needed, all trees, brush, stumps and other objectionable materials shall be removed so they will not interfere with the construction or proper functioning of the channel.
2. Where possible, trees will be left standing, and stumps will not be removed.
3. Excavation shall be at the locations and grades shown on the Drawings. The lining shall not compromise the capacity of the channel, e.g. the emergency spillway shall be over-excavated so that the lining will be flush with the slope surface.
4. The geotextile shall be placed on a smooth graded surface. The geotextile shall be placed in such a manner that it will not excessively stretch or tear upon placement of the overlying materials. Care should be taken to place the geotextile in intimate contact with the soil such that no void spaces exist between the underlying soil and the geotextile.
5. Construction plans will specifically detail the location and handling of spoils. Spoil material resulting from clearing, grubbing and channel excavation shall be disposed of in a manner which will:

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- a. not cause an increase in flood stage,
 - b. minimize overbank wash,
 - c. not cause an adverse effect on the environmental integrity of the area,
 - d. provide for the free flow of water between the channel and flood plain unless the valley routing and water surface profile are based on continuous dikes being installed,
 - e. leave the right-of-way in the best condition feasible, and
 - f. improve the aesthetic appearance of the site to the extent feasible.
6. Channel linings shall be established or installed immediately after construction or as soon as weather conditions permit.
 7. Structures shall be installed according to lines and grades shown on the plan. The foundation for structures shall be cleared of all undesirable materials prior to the installation of the structures.
 8. Materials used in construction shall be of permanency commensurate with the design frequency and life expectancy of the facility.
 9. Earthfill, when used as a part of the structures, shall be placed according to the installation requirements for sediment basin embankments.
 10. Construction operations shall be carried out in such a manner that erosion and air and water pollution will be minimized. State and local laws concerning pollution abatement shall be complied with.
 11. Vegetation shall be established on all disturbed areas immediately after construction. If weather conditions cause a delay in establishing vegetation, the area shall be mulched in accordance with the standard for mulching.
 12. All temporary access roads or travelways shall be appropriately closed to exclude traffic.
 13. Trees and other fallen natural vegetation not causing a deterrent to stream flow should be left for the purpose of habitat.
- J. Downdrain Structures
1. Place slope drains on undisturbed soil or well compacted fill at locations and elevations shown on the Drawings.
 2. Slightly slope the section of pipe under the dike toward its outlet.

3. Hand tamp the soil under and around the entrance section in lifts not to exceed 6 inches.
4. Ensure that fill over the drain at the top of the slope has minimum dimensions of 1.5 ft. depth, 4 ft. top width, and 3:1 side slopes.
5. Ensure that all slope drain connections are watertight.
6. Ensure that all fill material is well-compacted. Securely fasten the exposed section of the drain with grommets or stakes spaced no more than 10 feet apart.
7. Place the drain slightly diagonally across the slope, extending the drain beyond the toe of the slope. Curve the outlet uphill and adequately protect the outlet from erosion.
8. If the drain is conveying sediment-laden runoff, direct all flows into a sediment trap or sediment basin.
9. Make the settled, compacted dike ridge no less than one foot above the top of the pipe at every point.
10. Immediately stabilize all disturbed areas following construction.
11. Install Storm Drain Outlet Protection as specified in this Part.
12. Maintenance: Inspect the slope drain and supporting diversion after every rainfall and promptly make necessary repairs. When the protected area has been permanently stabilized and the permanent stormwater disposal system is fully functional, temporary measures may be removed, materials disposed of properly, and all disturbed areas stabilized appropriately.

K. Filter Ring

1. Filter Rings be placed as shown on the Drawings and as directed by the Engineer.
2. The filter ring shall be constructed at a height no less than two feet from grade.
3. Mechanical or hand placement of stone shall be required to uniformly surround the structure to be supplemented. Refer to Rip Rap, within this specification, for rock rip rap specifications.
4. When utilized below a storm drain outlet, it shall be placed such that it does not create a condition causing water to back-up into the storm drain and inhibit the function of the storm drain system.
5. Maintenance: The filter ring must be kept clear of trash and debris. This will require continuous monitoring and maintenance, which includes sediment

removal when one-half full. Structures are temporary and should be removed when the land-disturbing project has been stabilized.

L. Temporary Sediment Basin

1. Site Preparation: 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) will be cleared of all brush and trees.
2. Cut-off Trench: A cut-off trench will 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.
3. Embankment: The fill material shall be taken from approved areas shown on the Drawings. 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.
4. 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 haunches. A minimum depth of two feet of hand compacted backfill shall be placed over the pipe spillway before crossing it with construction equipment.

5. **Emergency Spillway:** The emergency spillway shall be installed in 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 must be constructed within a tolerance of ± 0.2 feet. If the emergency spillway requires erosion protection other than vegetation, the lining shall not compromise the capacity of the emergency spillway, e.g. the emergency spillway shall be over-excavated so that the lining will be flush with the slope surface.
6. **Vegetative Treatment:** Stabilize the embankment and all other disturbed areas in accordance with the appropriate permanent vegetative measure, see Specification 02933 Permanent Seeding, immediately following construction. In no case shall the embankment remain unstabilized for more than seven days.
7. **Erosion and Pollution Control:** Construction operations will 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.
8. **Maintenance:** Repair all damages caused by soil erosion or construction equipment 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. Sediment shall not enter adjacent streams or drainage ways during sediment removal or disposal. The sediment shall not be deposited downstream from the embankment, adjacent to a stream or floodplain.
9. **Final Disposal:** When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposits are to be leveled or otherwise disposed of in accordance with 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 must be removed, safely disposed of, and backfilled with a structural fill. When the basin area is to remain open space, the pond may be pumped dry, graded and backfilled.

M. Temporary Stream Crossing

1. All Crossings:
 - a. Clearing of the stream bed and banks shall be kept to a minimum.
 - b. All surface water from the construction site shall be diverted onto undisturbed areas adjoining the stream. Line unstable stream banks with rip rap or otherwise appropriately stabilize them.
 - c. The structure shall be removed as soon as it is no longer necessary for Project construction.

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- d. Upon removal of the structure, the stream shall immediately be restored to its original cross-section and properly stabilized.
2. Temporary Bridge Crossing:
 - a. The temporary bridge shall be constructed at or above bank elevation to prevent the entrapment of floating materials and debris.
 - b. Abutments shall be placed parallel to and on stable banks.
 - c. Bridges shall be constructed to span the entire channel. If the channel width exceeds eight feet (as measured from the tops of the banks), a footing, pier or bridge support may be constructed within the waterway.
 - d. Bridges shall be securely anchored at only one end using steel cable or chain. Large trees, large boulders, or driven steel anchors can serve as anchors.
 3. Temporary Culvert Crossing:
 - a. The invert elevation of the culvert shall be installed on the natural streambed grade.
 - b. The culvert(s) shall extend a minimum of one foot beyond the upstream and downstream toe of the aggregate placed around the culvert. In no case shall the culvert exceed 40 feet in length.
 - c. The culvert(s) shall be covered with a minimum of one foot of aggregate. If multiple culverts are used, they shall be separated by a minimum of 12 inches of compacted aggregate fill.
 4. Maintenance: The structure shall be inspected after every rainfall and at least once a week, whether it has rained or not, and all damages repaired immediately. The structure shall be removed immediately after construction is finished, and the streambed and banks must be stabilized.

N. Storm Drain Outlet Protection

1. Ensure that the subgrade for the filter and rip rap follows the required lines and grades shown in the plan. Compact any fill required in the subgrade to the density of the surrounding undisturbed material. Low areas in the subgrade on undisturbed soil may also be filled by increasing the rip rap thickness.
2. The rip rap and gravel filter must conform to the specified grading limits shown in the plans.
3. Geotextile must meet design requirements and be properly protected from punching or tearing during installation. Repair any damage by removing the rip rap and placing another piece of filter fabric over the damaged area. All

connecting joints should overlap a minimum of 1 foot. If the damage is extensive, replace the entire filter fabric.

4. Rip rap may be placed by equipment, but take care to avoid damaging the filter.
5. The minimum thickness of the rip rap should be 1.5 times the maximum stone diameter.
6. Construct the apron on zero grade with no overfall at the end. Make the top of the rip rap at the downstream end level with the receiving area or slightly below it.
7. Ensure that the apron is properly aligned with the receiving stream and preferably straight throughout its length. If a curve is needed to fit site conditions, place it in the upper section of the apron.
8. Immediately after construction, stabilize all disturbed areas with vegetation.
9. Filter: Install a filter to prevent soil movement through the openings in the rip rap. The filter should consist of a graded gravel layer or a synthetic filter cloth.
10. Maintenance: Inspect rip rap outlet structures after heavy rains to see if any erosion around or below the rip rap has taken place or if stones have been dislodged. Immediately make all needed repairs to prevent further damage.

O. Gradient Treatment

1. Contour Furrow: The maximum distance between furrows should be 40 feet, and the maximum slope length should be 200 feet. Refer to the Tennessee Erosion and Sediment Control Handbook, latest edition for detailed example of a contour furrow.
2. Serrated Slope: Bladed equipment will be needed to make numerous passes along a slope, beginning at the top and working downward. The maximum slope length should be 100 feet. Refer to the Tennessee Erosion and Sediment Control Handbook, latest edition for detailed example of a serrated slope.
3. Stepped Slope: Construct stepped slope as shown in the detailed example in the Tennessee Erosion and Sediment Control Handbook, latest edition. Steps should be wide enough to work with standard earth moving equipment. Preferably the horizontal distance should be at least 1.5 times the vertical cut distance. Slightly grade the horizontal bench inwards (e.g. back towards the top of slope). Do not make individual vertical cuts more than 24 inches high in soft materials or more than 36 inches high in rocky materials.
4. Terraced Slope: Designed drainage channels are located in the slope at regular intervals and have a regular cross-section including slope and depth requirements. Locate intersecting channels to convey storm water to the bottom of the slope. The maximum slope height between terraces shall be 30 feet for

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cut slopes and 25 feet for fill slopes. Terrace widths should be at least 6 feet wide. Refer to the Tennessee Erosion and Sediment Control Handbook, latest edition for detailed example of a terraced slope.

5. Seeding: Roughened areas shall be seeded and mulched as soon as possible to obtain optimum seed germination and seeding growth. Refer to Specifications for temporary mulching, vegetation in this Specification and permanent vegetation in Section 32 92 19, Permanent Seeding and 32 92 23, Permanent Sodding and the seeding table contain within the Drawings.

P. Temporary Mulching

1. When mulch is used without seeding, mulch shall be applied to provide full coverage of the exposed area. Mulch shall be applied as follows:
 - a. Dry straw or hay mulch and wood chips shall be applied uniformly by hand or by mechanical equipment.
 - b. 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.
 - c. Apply mulch binder on exposed areas, where indicated on the Drawings or as instructed by the Engineer.
2. Anchoring Mulch:
 - a. Straw or hay mulch can be pressed into the soil with a disk harrow with the disk set straight or with a special "packer disk." Disks may be smooth or serrated and should be 20 inches or more in diameter and 8 to 12 inches apart. The edges of the disk should be dull enough not to cut the mulch but to press it into the soil leaving much of it in an erect position.
 - b. Straw or hay mulch shall be anchored immediately after application.
 - c. Straw or hay mulch spread with special blower-type equipment may be anchored with emulsified asphalt (Grade AE-5 or SS-1). The asphalt emulsion shall be sprayed onto the mulch as it is ejected from the machine. Use 100 gallons of emulsified asphalt and 100 gallons of water per ton of mulch.
 - d. For straw or hay mulch, plastic mesh or netting with mesh no larger than one inch by one inch shall be installed according to manufacturer's specifications.
 - e. Netting of the appropriate size shall be used to anchor wood waste. Openings of the netting shall not be larger than the average size of the wood waste chips.

Q. Temporary Grassing

1. Seed Bed Preparation:

- a. When a hydraulic seeder is used, seedbed preparation is not required.
- b. When using conventional or hand seeding, seedbed preparation is not required if the soil material is loose and not sealed by rainfall.
- c. When soil has been sealed by rainfall or consists of smooth cut slopes, the soil shall be pitted, trenched or otherwise scarified to provide a place for seed to lodge and germinate.

2. Select a grass or grass-legume mixture suitable to the area and season of the year.

3. Seed shall be applied uniformly by hand, cyclone seeder, drill, culti-packer-seeder, or hydraulic seeder (slurry including seed and fertilizer). Drill or cultipacker seeders should normally place seed one-quarter to one-half inch deep. Appropriate depth of planting is ten times the seed diameter.

4. Soil should be "raked" lightly to cover seed with soil if seeded by hand.

5. Irrigation: During times of drought, water shall be applied at a rate not causing runoff and erosion. The soil shall be thoroughly wetted to a depth that will insure germination of the seed. Subsequent applications should be made when needed.

6. Temporary Stabilization: Temporary stabilization shall be provided as shown on the Drawings and conforming to these Specifications to control erosion on the site. Temporary stabilization shall be provided to any area which will not receive permanent stabilization within the next 7 calendar days.

R. Permanent Grassing and Sodding

1. Refer to Specifications 32 92 19 Permanent Seeding and 32 92 23 Permanent Sodding and the seeding table contain within the Drawings for installation and maintenance.

2. Permanent Stabilization:

- a. Permanent stabilization shall be provided as shown on the Drawings and conforming to these Specifications to control erosion on the site. Permanent stabilization shall be provided to all areas of land disturbance within seven calendar days of the completion of land disturbance for any area greater than 0.25 acre.

- b. Grass or sod removed or damaged in residential areas shall be replanted

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with the same variety within seven calendar days of the completion of work in any area.

- c. Where permanent stabilization cannot be immediately established because of an inappropriate season, the Contractor shall provide temporary stabilization. The Contractor shall return to the site at the appropriate season to provide permanent stabilization in areas that received only temporary stabilization.

S. Turbidity Curtains

1. Installation:

- a. In calm waters, such as lakes and ponds, set the curtain end stakes or anchor points (using anchor buoys if bottom anchors are employed), then tow out the curtain in the furled condition and attach it to these stakes or anchor points. Following this, any additional stakes or buoyed anchors required to maintain the desired location of the curtain shall be set, and these anchor points made fast to the curtain. Only then shall the furling lines be loosened to let the curtain skirt drop.
- b. In rivers or in other moving water, set all the curtain anchor points. Care must be taken, prior to putting the furled curtain into the water, to ensure that anchor points are of sufficient holding power to retain the curtain under the existing current conditions. Anchor buoys shall be employed on all anchors to prevent the current from submerging the flotation at the anchor points. If the moving water into which the curtain is being installed is tidal and will subject the curtain to currents in both directions as the tide changes, provide anchors on both sides of the curtain. Once the anchors are secure, the furled curtain shall be secured first to the anchor point that is farthest upstream, then attached sequentially to each downstream anchor point in turn until the entire curtain is in position. At this point, and before unfurling, the "lay" of the curtain shall be assessed and any necessary adjustments made to the anchors. Finally, when the location is ascertained to be as desired, the furling lines shall be loosened to allow the skirt to drop.
- c. Attach anchor lines to the flotation device, not to the bottom of the curtain.

2. Removal:

- a. Protect the silt curtain skirt from damage by furling the curtain before it is removed from the water.
- b. The site selected to bring the curtain ashore should be free of sharp rocks, broken cement, debris, etc., so as to minimize damage when hauling the curtain over the area.
- c. If the curtain has a deep skirt and no furling system, it shall be protected

by running a small boat with a crew installing furling lines along its length before attempting to remove the curtain from the water.

3. Maintenance:

- a. The Contractor is responsible for maintenance of the turbidity curtain for the duration of the Project in order to ensure the continuous protection of the watercourse.
- b. Should repairs to the geotextile fabric become necessary, there are repair kits available from the manufacturer, and their instructions shall be followed to ensure the adequacy of the repair.
- c. When the curtain is no longer required, as determined by the Engineer, the curtain and related components shall be removed in such a manner as to minimize turbidity. Remaining sediment shall be sufficiently settled before removing the curtain. Sediment shall be removed and the original depth (or plan elevation) restored. Any spoils shall be taken to an upland area and be stabilized.

T. Sediment Traps

1. Installation:

- a. The embankment should be compacted in 6-inch layers by traversing with construction equipment.
- b. All cut and fill slopes should be 2:1 or less (except for excavated, wet storage area which may be at a maximum 1:1. grade).
- c. Construction operations should be carried out in such a manner that erosion during construction of the structure is minimized.
- d. The earthen embankment should be seeded with temporary or permanent seeding immediately after installation.

2. Removal: The structure should be removed and the area stabilized when the upslope drainage area has been stabilized.

3. Maintenance:

- a. Sediment should be removed and the trap restored to its original dimensions when the sediment has accumulated to one half the design volume of the wet storage. Sediment removal from the basin should be deposited in a suitable area and in such a manner that it will not erode and cause sedimentation problems.
- b. Maintenance needs identified in inspections or by other means should be accomplished before the next storm event if possible, but in no case more

than seven days after the need is identified.

3.03 Clean-Up

- A. Dispose of all excess erosion and sedimentation control materials in a manner satisfactory to the Engineer.
- B. All temporary erosion control measures shall be removed after final stabilization of the site has occurred, unless otherwise noted on the Drawings or instructed by the Engineer.
- C. Final clean-up shall be performed in accordance with the requirements of Section 01 74 00 of these Specifications.

END OF SECTION

Part 1 General

1.01 Description

- A. The work covered in this section consists of implementing best management practices (BMPs) to prevent and minimize erosion and resultant sedimentation in all disturbed areas during and after construction. The Contractor shall furnish all material, labor and equipment necessary for the proper installation, maintenance, monitoring, reporting and removal (where applicable) of erosion prevention and control measures and to cause compliance with the General NPDES Permit for Discharges of Storm Water Associated with Construction Activities: Permit No. TNR100000.
- B. Related Work:
1. Erosion and Sediment Control - Section 01 57 13
 2. Permanent Seeding – Section 32 92 19
 3. Permanent Sodding – Section 32 92 23
 4. Topsoil - Section 32 91 19.13
 5. Storm Water Pollution Prevention Plan (SWPPP)

1.02 Submittals

- A. The following submittals shall be made in accordance with the requirements of this Section and of the NPDES Permit as applicable:
1. Notice of Intent (NOI)
 2. Credentials of Certified Personnel
 - a. Prior to construction activities, the Contractor shall submit to the Owner in writing the name(s) of the Contractor's designated Certified Personnel and shall provide credentials indicating that the named Certified Person has completed an appropriate erosion and sediment courses that fulfills the requirements of the NPDES Permit.
 - b. The Owner reserves the right to reject any candidate it deems unqualified for the position and, furthermore, may require the Contractor to replace an unqualified individual with a suitable substitute at anytime throughout the life of the Project, at no additional cost to the Owner.
 3. Inspection Checklists and Reports
 4. Monitoring Reports
 5. Notice of Termination (NOT)

- B. Shop drawings and product data for materials furnished under the ES&PC Plan and this Section shall be submitted to the Owner in conformance with the requirements of Section 01 33 23 (Shop Drawings, Product Data and Samples) of these Specifications.

1.03 References

- A. Contractor shall be familiar with the following referenced documents. These documents shall be complied with as applicable.
 - 1. General NPDES Permit for Discharges of Storm Water Associated with Construction Activities: Permit No. TNR100000.
 - 2. Tennessee Erosion and Sediment Control Handbook (latest edition).
 - 3. State of Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.
 - 4. Local Issuing Authority's Soil Erosion and Sedimentation Control Ordinances.
 - 5. Storm Water Pollution Prevention Plan (SWPPP) as required by the NPDES Permit.
- B. The General NPDES Permit for Discharges of Storm Water Associated with Construction Activities: Permit No. TNR100000 is incorporated into these Specifications by reference. A copy of the permit may be downloaded from the Tennessee Department of Environment & Conservation's website:

<http://www.state.tn.us/environment/permits/conststrm.shtml>

1.04 Definitions

- A. Design Professional: For the purpose of this Section the term Design Professional is synonymous with consulting engineer, licensed professional, designer, and consultant used in permits, laws, rules, regulations, ordinances and other soil erosion and sediment control references. For the purposes of this Specification the Owner may at any time during the Project provide direction. This direction shall be considered equivalent to direction from the Design Professional.
- B. Engineer: For the purposes of this Section the term Engineer refers to a person or representative for the Owner performing construction oversight and managing construction activities and inspections.
- C. Contractor: For the purposes of this Section the term Contractor is synonymous with General Contractor, Discharger, Operator, Primary Permittee and Permittee (permit holder) as used in permits, laws, rules, regulations, ordinances, and other soil erosion and sediment control references.
- D. Certified Personnel or Certified Person: For the purposes of this Section, the terms Certified Personnel and Certified Person mean a person who has successfully

completed an erosion and sediment controls short course eligible for continuing education units, or an equivalent course approved by Tennessee Department of Environment & Conservation.

- E. Other Definitions: Definitions as listed in the NPDES Permit shall apply in this Section.

1.05 Regulatory Compliance

- A. Land disturbance activities are not authorized to begin until after all required erosion and sediment control permits are obtained from the United States, the State of Tennessee, and/or Local Issuing Authority. The Contractor is the operator, and therefore a Co-Primary Permittee, under the provisions of the NPDES Permit. As such, Contractor will be required to sign certain certifications as described in the NPDES Permit. Contractor shall comply with requirements specified in the Contract Documents or by the Owner. Contractor shall also comply with all other laws, rules, regulations, ordinances and requirements concerning soil erosion and sediment control established in the United States, the State of Tennessee, and/or Local Issuing Authority. The following documents and the documents referenced therein define the regulatory requirements for this Section.
1. NPDES Permit: The Tennessee General NPDES Permit for Discharges of Storm Water Associated with Construction Activities: Permit No. TNR100000 governs land disturbance or construction activities of one acre or more. On applicable sites, the Contractor is responsible for complying with terms and conditions of this permit.
 2. "Tennessee Erosion and Sediment Control Handbook", latest edition: Contractor shall follow Practices and Standards of the Tennessee Erosion and Sediment Control Handbook.
- B. The Contractor is responsible for any applicable fees associated with NPDES Permit.
- C. Fines resulting from non-compliance with the NPDES permit shall be paid by the Contractor at no additional expense to the Owner.

Part 2 Products

As specified in the SWPPP, Section 01 57 13, Section 32 92 19, Section 32 92 23 and Section 32 91 19.13.

Part 3 Execution

3.01 Notice of Intent (NOI)

- A. The NOI shall be signed by the Contractor as Co-Primary Permittee in accordance with the Signatory Requirements of the NPDES Permit and returned to the Owner for submission to EPD. A copy of the NOI may be downloaded from the Tennessee Department of Environment & Conservation's website:

<http://www.state.tn.us/environment/permits/conststrm.shtml>

- B. The NOI must be submitted in accordance with the NPDES Permit prior to the start of construction activities. The Contractor may not start construction activities until written authorization from Tennessee Department of Environment & Conservation is received in the form of a letter of coverage under the terms and conditions of the NPDES Permit.

3.02 Installation

- A. Erosion control measures shall be installed as shown on the Contract Drawings and in accordance with Section 01 57 13: Erosion and Sediment Control, Section 32 92 19: Permanent Seeding, Section 32 92 23: Permanent Sodding and Section 32 91 19.13: Topsoil.
- B. Rainfall and storm water monitoring equipment shall be installed as identified in the SWPPP and/or as shown on the Contract Drawings.

3.03 Inspections and Reporting

- A. The Engineer who prepared the SWPPP shall inspect the installation of the erosion control measures within one week after initial construction activities begin. The Engineer shall notify the Primary Permittee of any deficiencies. The Contractor must correct all deficiencies within two business days of receipt of the Engineer's inspection report.
- B. The Contractor will designate a Certified Person who shall perform all inspections required by the NPDES Permit and this Specification.
- C. Reports
 1. All inspections shall be summarized in a report. A sample inspection checklist is included at the end of this Section for the Contractor's reference and/or use.
 2. Reports shall identify any deficiencies and incidents of non-compliance, major observations relating to the SWPPP, and any revisions or amendments to the SWPPP. Where incidents of non-compliance are not identified within the report, the report shall contain a certification that the facility is in compliance with the SWPPP and the NPDES Permit.
 3. All inspection reports shall contain a summary of the inspection, the name and signature of the Certified Person making the inspection, and the date of the inspection.
 4. All inspection reports shall be submitted to the Owner or the Engineer on a weekly basis for review and retention. The Owner may withhold payments to the Contractor if such reports are not submitted in a timely manner.
 5. All reports shall contain signed certification statements as required by the NPDES Permit.

6. Inspection documentation will be maintained on site and made available upon request. Inspection reports must be submitted to the Tennessee Department of Environment & Conservation within 10 days of the request. Permittees discharging into impaired or high quality waters are required to use the inspection form provided in Appendix C of the NPDES Permit.

3.04 Maintenance

- A. Erosion and sediment controls as described in these Contract Documents shall be maintained in good working condition throughout the life of the project. Any part of the erosion and sediment control components found to be damaged or defective shall be promptly repaired or replaced.
- B. After completion of area surfacing, and with the approval of Owner or Engineer, the Contractor shall remove and dispose off-site all temporary erosion control measures and shall restore the ground to its original condition.

3.05 Monitoring and Reporting

- A. The Contractor shall monitor and record daily (once each twenty-four hour period) rainfall data in accordance with the SWPPP and the NPDES Permit. Rainfall measurements shall be made at the same time each day.
 1. The following information shall be recorded for each daily rainfall measurement:
 - a. Project name and number
 - b. Contractor's Certified Person
 - c. Date and time
 - d. Reading and name of person taking reading
- B. The Owner reserves the right to use its own resources to duplicate monitoring and verify the work required by the Contractor in this Section.

3.06 Notice of Termination (NOT)

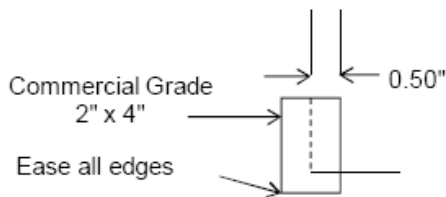
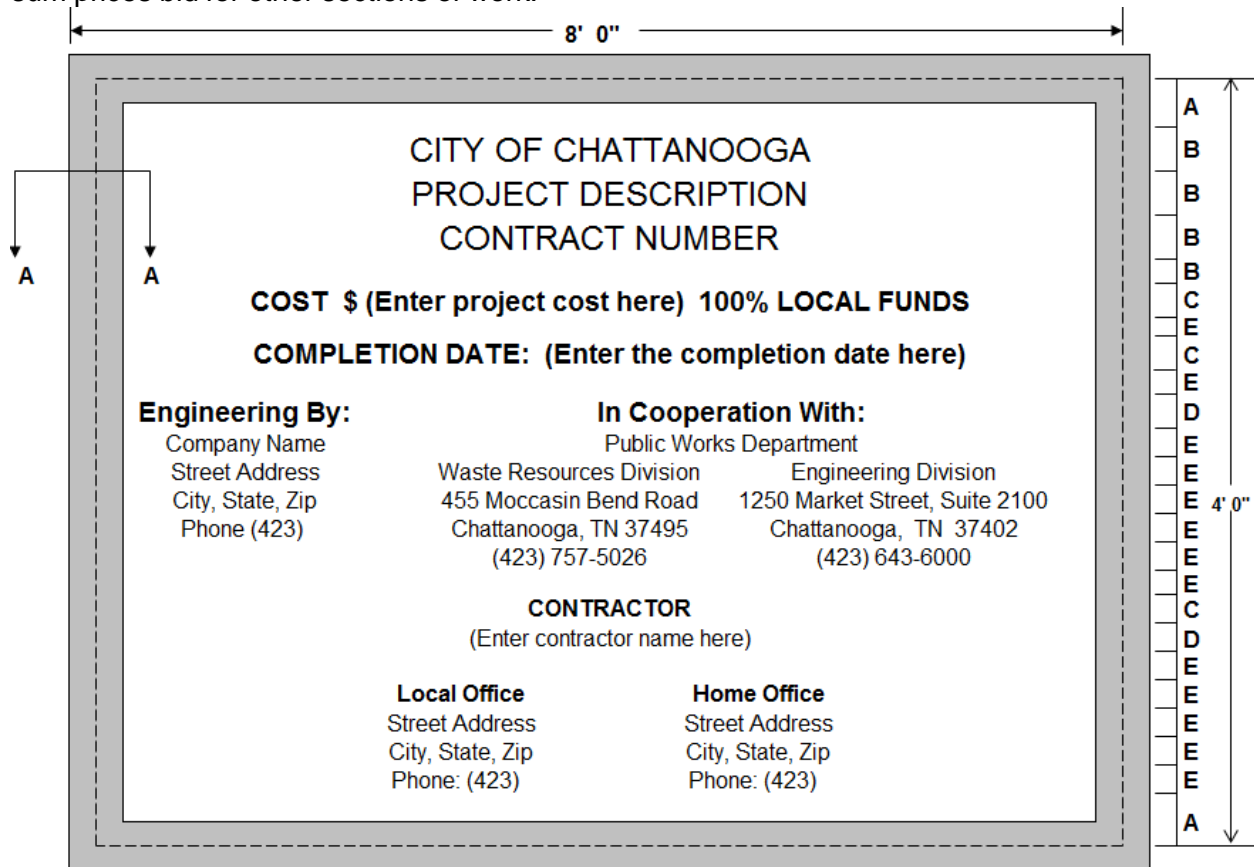
When all construction activities have ceased, final stabilization has been implemented by the Contractor, and the site is in compliance with the NPDES permit, the Contractor shall provide a written statement to the Owner that the site is in compliance with the NPDES permit and that Contractor is prepared to sign and submit the Notice of Termination. The Owner shall make the final submittal of the Notice of Termination (NOT) to Tennessee Department of Environment & Conservation. A copy of the NOT may be downloaded from the Tennessee Department of Environment & Conservation website:

<http://www.state.tn.us/environment/permits/conststrm.shtml>

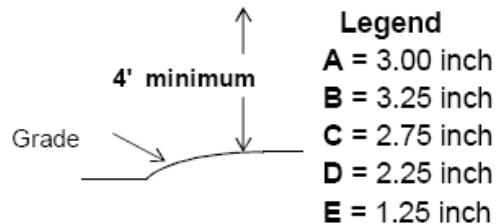
END OF SECTION

The Contractor shall erect two signs identifying the construction project at locations to be designated by the Engineer. The sign shall be substantially in accordance with the drawing below and shall be made of oil base paint on 3/4-inch exterior plywood and maintained in good conditions until completion of the work defined under these Contract Documents. The Contractor shall submit a layout of the sign for approval by the Engineer.

No separate payment will be made for the signs. Payment shall be included in the unit or lump sum prices bid for other sections of work.



Section A - A



Notes:

1. Sign to be 3/4 inch thick exterior grade plywood.
2. Provide adequate supports to keep sign above prevailing grade to permit public viewing.
3. Edge, trim, and letters shall be dark blue; background shall be white.

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 by the Contractor at no additional cost to the Owner prior to being incorporated into the work.

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 which 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.
- 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

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 Engineer.
2. All property damaged by reason of storing of material shall be properly replaced at no additional cost to the Owner.
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.
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 stored on the site which may require protection from damage by the elements.

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 Owner.

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

Storage and Protection

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, gypsumboard, 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

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 which 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

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. The Contractor shall assume all costs associated with rectifying work constructed in the wrong location.
- B. From the information shown on the Drawings and the information to be provided as indicated under Project Conditions below, the Contractor shall:
 - 1. Be responsible for 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.
 - 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 permanent and temporary easements or the limits of construction to ensure that the work is not deviating from the indicated limits.
 - 4. 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.
- C. 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.
- D. Record Drawing surveys shall be performed in accordance with Section 01 78 39 of these Specifications.

1.02 Project Conditions

- A. The Drawings provide the location and/or coordinates of principal components of the Project. The alignment of some components of the Project may be indicated in the Specifications. 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 survey points, control points, and baseline to be provided to the Contractor shall be limited to only that information which can be found on the Project site by the Contractor.

1.03 Quality Assurance

- A. The Contractor shall furnish documentation, prepared by a surveyor currently registered in the State in which the Project is located, confirming that staking is being done to the horizontal and vertical alignment shown in the Contract Documents. This requires that the Contractor hire, at the Contractor's own expense, a currently registered surveyor, acceptable to the Owner, to provide ongoing construction staking or confirmation of such.
- B. Any deviations from the Drawings shall be confirmed by the Engineer prior to construction of that portion of the Project.
- C. Construction Surveying Cash Allowance
 - 1. This cash allowance is solely for the use of the Engineer for verification of the Contractor's reference points, centerlines and work performed and is not to be used by the Contractor to provide cut sheets.
 - 2. The presence of this cash allowance in no way relieves the Contractor of the responsibility of installing reference points, centerlines, temporary bench marks, verifying that the work has been performed accurately, and all other work covered by this Section.

1.04 Sewers and Accessories

- A. Staking Precision: The precision of construction staking shall be no less than 1:10,000. Horizontal distances shall be measured with a precision no less than 0.01 feet, and horizontal angles measured with a precision of no less than 10 seconds.
- B. Reference Points
 - 1. The surveyor shall obtain the coordinates on each manhole and provide this information to the Engineer.
 - 2. Reference points shall be placed, at or no more than three feet, from the outside of the construction easement or right-of-way. The location of the reference points shall be recorded in a log with a copy provided to the Engineer for use prior to his verifying reference point locations. Distances between reference points and the manhole centerlines shall be accurately measured to the nearest 0.01 foot.
 - 3. The Contractor shall give the Engineer reasonable notice that reference points are set. The reference point locations must be verified by the Engineer prior to commencing clearing and grubbing operations.

END OF SECTION

Part 1 General

1.01 Scope

- A. The work under this Section includes, but is not necessarily limited to, cutting and patching work as indicated on the Drawings, herein specified and as necessary for proper and complete performance of the work.
- B. Requirements for cutting and patching may be described in various sections of these Specifications.
- C. Execute cutting, including excavating and filling, or patching of work required to:
 - 1. Make several parts fit properly.
 - 2. Uncover work to provide for installation of ill-timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to requirements of the Contract Documents.
 - 5. Remove samples of the installed work as specified for testing.
 - 6. Install specified work in existing construction.
- D. In addition, upon written instruction of the Engineer:
 - 1. Uncover work to provide for the Engineer's observation of covered work.
 - 2. Remove samples of the installed materials for testing.
 - 3. Remove work to provide for alteration of existing work.
- E. Protection of Work
 - 1. Do not endanger any work by cutting or altering the work or any part of it.
 - 2. Do not cut or alter the work of another contractor without written consent of the Engineer.

1.02 Submittals

- A. Prior to cutting which affects the structural safety of the Project or the work of another contractor, submit a written notice to the Engineer requesting consent to proceed with cutting. The notice shall include:

Cutting and Patching

1. Identification of Project
 2. Description of defective work
 3. Necessity for cutting
 4. Affect on other work or on the structural integrity of the Project.
 5. Description of the proposed work including:
 - a. Scope of cutting and patching
 - b. Subcontractor and trades to execute work
 - c. Products proposed to be used
 - d. Extent of refinishing
 6. Alternatives to cutting and patching.
 7. Designation of party responsible for the cost of cutting and patching.
- B. Cost Estimate: Prior to cutting and patching performed on instruction of the Engineer, submit a cost estimate.
- C. Should conditions of the work or the schedule necessitate alternative materials or methods, submit a written recommendation to the Engineer that includes:
1. Compelling conditions for alternative materials or methods
 2. Recommended alternative materials or methods
 3. Submittals as required for substitutions
- D. Uncovered Work: Submit written notice to the Engineer designating the time the work will be uncovered for the Engineer's observation.

1.03 Payment For Cost

- A. Contractor's Costs: Costs caused by ill-timed or defective work or work not conforming to the Contract Documents, including costs for additional services of the Engineer, shall be paid by the Contractor.
- B. Owner's Costs: Cost of work done as the result of the Engineer's/Owner's instructions, which is not shown on the Drawings or specified, other than defective or non-conforming work, will be paid for by the Owner.

Part 2 Products

2.01 Materials

All products and materials shall conform to the requirements of the Specifications for the type of work being performed, except where no products are specified in these Specifications for the item being replaced; then the products and materials shall be of an equivalent type, quality, thickness and width of the item removed.

Part 3 Execution

3.01 Inspection

- A. Inspect existing conditions of the work including elements subject to movement or damage during cutting and patching, or excavating and backfilling.
- B. After uncovering work, inspect conditions affecting the installation of new products.

3.02 Preparation

- A. Provide shoring, bracing and support as required to maintain structural integrity of the Project.
- B. Provide protection for other portions of the Project and provide protection from the elements.

3.03 Performance

- A. Execute fitting and adjustments of products to provide finished installation that complies with specified tolerances and finishes.
- B. Execute cutting and demolition by means that will prevent damage to other work and will provide proper surfaces to receive installation of repairs and new work.
- C. Execute excavating and backfilling as specified in Section 31 20 00 or Section 31 23 33 of these Specifications.
- D. Restore work which has been cut or removed and install new products to provide completed work in accordance with the requirements of the Contract Documents.
- E. Refinish entire surfaces as necessary to provide an even finish. Continuous surfaces shall be refinished to the nearest intersection and assemblies shall be entirely refinished.

END OF SECTION

Part 1 General

1.01 Scope

This Section covers the general cleaning which the Contractor shall be required to perform both during construction and before final acceptance of the Project unless otherwise shown on the Drawings or specified elsewhere in these Specifications.

1.02 Quality Assurance

- A. Daily, and more often if necessary, conduct inspections verifying that requirements of cleanliness are being met.
- B. In addition to the standards described in this Section, comply with all pertinent requirements of governmental agencies having jurisdiction.

1.03 Cleaning Materials and Equipment

- A. Provide all required personnel, equipment and materials needed to maintain the specified standard of cleanliness.
- B. Use only the cleaning materials, methods and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as approved by the Engineer.

1.04 Progress Cleaning

- A. General
 - 1. Do not allow the accumulation of scrap, debris, waste material and other items not required for construction of this work.
 - 2. At least each week, and more often if necessary, completely remove all scrap, debris and waste material from the job site.
 - 3. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the environment.
- B. Site
 - 1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage.
 - 2. Restack materials stored on site weekly.
 - 3. At all times maintain the site in a neat and orderly condition which meets the

approval of the Engineer.

1.05 Final Cleaning

- A. Definitions: Unless otherwise specifically specified, "clean" for the purpose of this Article shall be interpreted as the level of cleanliness generally provided by commercial building maintenance subcontractors using commercial quality building maintenance equipment and materials.
- B. General: Prior to completion of the work, remove from the job site all tools, surplus materials, equipment, scrap, debris and waste. Conduct final progress cleaning as described in 1.04 above.
- C. Site: Unless otherwise specifically directed by the Engineer, hose down all paved areas on the site and all public sidewalks directly adjacent to the site; rake clean other surfaces of the grounds. Completely remove all resultant debris.
- D. Post-Construction Cleanup: All evidence of temporary construction facilities, haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other evidence of construction, shall be removed as directed by the Engineer.
- E. Restoration of Landscape Damage: Any landscape feature damaged by the Contractor shall be restored as nearly as possible to its original condition at the Contractor's expense. Restoration shall be performed to the satisfaction of the Engineer.
- F. Timing: Schedule final cleaning as approved by the Engineer to enable the Owner to accept the Project.

1.06 Cleaning During Owner's Occupancy

Should the Owner occupy the work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning of the occupied spaces shall be as determined by the Engineer in accordance with the Supplementary Conditions of the Contract Documents.

1.07 Disposal of Waste

- A. Except for items or materials to be salvaged, recycled, or otherwise reused, and except for options available below for vegetative waste generated by clearing and grubbing operations, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
- B. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

- C. Remove and transport waste in a manner that will prevent spillage on adjacent surfaces and areas.
- C. Vegetative waste generated by clearing and grubbing operations may be disposed of by mulching. Timber within the areas cleared shall become the property of the Contractor. The Contractor may cut, trim, hew, saw or otherwise dress felled timber within the limits of the work area, provided all timber and all waste materials are disposed of as specified. All residual matter from mulching operations shall be removed from the Project site as waste in accordance with the provisions of this section of the Specifications.
- D. Burning: Except as allowed under Paragraph C above, do not burn waste materials on site.
- E. Waste removed from the Project site shall be disposed of in sites permitted by the Tennessee Department of Environment and Conservation (TDEC) for the acceptance of type of waste being disposed in accordance with Rules of TDEC Solid Waste Management, including Chapter 0400-11-01. Landfill types include:
 - 1. Class I Landfills - municipal solid waste, household waste, shredded/waste tires
 - 2. Class II Landfills - industrial waste
 - 3. Class III Landfills - farming wastes, landscaping and land clearing wastes
 - 4. Class IV Landfills - construction and demolition waste
- F. Exceptions to Paragraph E are as follows:
 - 1. Certain other wastes (such as medical/infectious waste, dead animals, sludges, pesticides wastes, hazardous wastes, asbestos) require special waste approval prior to disposal. See the TDEC Environmental Permitting Handbook for more information.
 - 2. Hazardous waste shall be disposed of in accordance with Rules of TDEC Solid Waste Management, including but not limited to Chapter 0400-12-01 and the rules and regulations of the United States Environment Protection Agency (EPA).
 - 2. Asbestos-containing waste shall also be handled and disposed in accordance with TCA 68-201-101 et seq, Rules of the Tennessee Department of Health, and TDEC Bureau of Environmental health Services, Division of Air Pollution, including Chapter 1200-3-11-.02 and 40 CFR 61.
 - 3. Excess earth material and excess excavated rock material may be placed on sites for which the Contractor provides to the Owner a signed affidavit from the property owner that the placement of such material is acceptable to the property owner. The Contractor and property owner shall be responsible for all permitting of such disposal.

Cleaning and Waste Management

- G. No waste shall be placed at a transfer station facility.
- H. The Contractor shall maintain records related to all waste removed from the Project site so as to allow the Owner or the Engineer to readily determine the following:
 - 1. Date waste removed from Project site.
 - 2. Name of hauler (company and driver) transporting such waste.
 - 3. General description of waste transported.
 - 4. "Truck tickets" indicating the waste disposal site and amount of waste disposed therein.

END OF SECTION

Part 1 General

1.01 Project Maintenance and Warranty

- A. Maintain and keep in good repair the work covered by these Drawings and Specifications until acceptance by the Owner.
- B. The Contractor shall warrant for a period of one year from the date of Owner's written final acceptance of the Project, as defined in the Contract Documents, that the completed work is free from all defects due to faulty products or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments or other work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect throughout the warranty period.
- C. The Contractor shall not be obligated to make replacements which become necessary because of ordinary wear and tear, or as a result of improper operation or maintenance, or as a result of improper work or damage by another Contractor or the Owner, or to perform any work which is normally performed by a maintenance crew during operation.
- D. In the event of multiple failures of major consequences prior to the expiration of the one year warranty described above, the affected unit shall be disassembled, inspected and modified or replaced as necessary to prevent further occurrences. All related components which may have been damaged or rendered non-serviceable as a consequence of the failure shall be replaced. A new 12 month warranty against defective or deficient design, workmanship, and materials shall commence on the day that the item is reassembled and placed back into operation. As used herein, multiple failure shall be interpreted to mean two or more successive failures of the same kind in the same item or failures of the same kind in two or more items. Major failures may include, but are not limited to, cracked or broken housings, piping, or vessels, excessive deflections, bent or broken shafts, broken or chipped gear teeth, premature bearing failure, excessive wear or excessive leakage around seals. Failures which are directly and clearly traceable to operator abuse, such as operations in conflict with published operating procedures or improper maintenance, such as substitution of unauthorized replacement parts, use of incorrect lubricants or chemicals, flagrant over- or under-lubrication and using maintenance procedures not conforming with published maintenance instructions, shall be exempted from the scope of the one year warranty. Should multiple failures occur in a given item, all products of the same size and type shall be disassembled, inspected, modified or replaced as necessary and rewarranted for one year.
- E. The Contractor shall, at Contractor's own expense, furnish all labor, materials, tools and equipment required and shall make such repairs and removals and shall perform such work or reconstruction as may be made necessary by any structural or functional defect or failure resulting from neglect, faulty workmanship or faulty materials, in any

Warranties and Bonds

part of the work performed by the Contractor. Such repair shall also include refilling of trenches, excavations or embankments which show settlement or erosion after backfilling or placement.

- F. Except as noted on the Drawings or as specified, all structures such as embankments and fences shall be returned to their original condition prior to the completion of the Contract. Any and all damage to any facility not designated for removal, resulting from the Contractor's operations, shall be promptly repaired by the Contractor at no cost to the Owner.
- G. The Contractor shall be responsible for all road and entrance reconstruction and repairs and maintenance of same for a period of one year from the date of final acceptance. In the event the repairs and maintenance are not made immediately and it becomes necessary for the owner of the road to make such repairs, the Contractor shall reimburse the owner of the road for the cost of such repairs.
- H. In the event the Contractor fails to proceed to remedy the defects upon notification within 15 days of the date of such notice, the Owner reserves the right to cause the required materials to be procured and the work to be done, as described in the Drawings and Specifications, and to hold the Contractor and the sureties on Contractor's bond liable for the cost and expense thereof.
- I. Notice to Contractor for repairs and reconstruction will be made in the form of a registered letter addressed to the Contractor at Contractor's home office.
- J. Neither the foregoing paragraphs nor any provision in the Contract Documents, nor any special guarantee time limit implies any limitation of the Contractor's liability within the law of the place of construction.

END OF SECTION

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. Addenda
 - 4. Reviewed shop drawings, product data and samples
 - 5. Change orders and other modifications to the Contract;
 - 6. Engineer field orders or written instructions, including Requests for Information (RFI) and Clarification Memorandums;
 - 7. Test records.
- C. The Contractor shall maintain on the Project site throughout the Contract Time an up to date set of Record Drawings.

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 at the site for the Owner one copy of all record documents.

Record Documents

- 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 of a certificate for payment.

1.03 Quality Assurance

- A. Unless noted otherwise, Record Drawings shall provide dimensions, distances and coordinates to the nearest 0.1 foot.
- B. Unless noted otherwise, Record Drawings shall provide elevations to the nearest 0.01 foot for all pertinent items constructed by the Contractor.
- C. For sanitary sewer construction, the Contractor shall employ a currently registered surveyor to prepare the Record Drawings from a post-construction, field run survey. The Record Drawings shall provide elevations to the nearest 0.01 foot for all manhole inverts, manhole frames and other pertinent items constructed by the Contractor. The Record Drawings shall provide dimensions, distances, and coordinates to the nearest 0.01 foot and horizontal angles to the nearest 10 seconds.

1.04 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.

1.05 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.
- B. Legibly mark drawings to record actual construction, including:
 - 1. All Construction
 - a. Changes of dimension and detail.
 - b. Changes made by Requests for Information (RFI), field order, clarification memorandums or by change order.
 - c. Details not on original Drawings.
 - 2. Site Improvements, Including Underground Utilities

- a. Horizontal and vertical locations of all exposed and underground utilities and appurtenances, both new facilities constructed and those utilities encountered, referenced to permanent surface improvements.
- b. Location of and dimensions of roadways and parking areas, providing dimensions to back of curb when present.
- c. The locations shall be referenced to at least two easily identifiable, permanent landmarks (e.g., power poles, valve markers, etc.) or benchmarks.

3. Structures

- a. Depths of various elements of foundation in relation to finish first floor datum or top of wall.
- b. Location of internal and buried utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

C. Sanitary Sewer/Stormwater Structural Locations:

- a. All sanitary sewer manholes, conveyances, pressurized mains and lift stations should be located by the center. English units and NAD 83 State Plane Coordinates shall be used. All applicable information required for each item on the "Sanitary Sewer Electronic Data Submittals - Explanation and Data Sheet" forms should be completed in Microsoft® Excel format and submitted to the Engineer.
- b. All stormwater conveyances, structures and detentions should be located by the center. English units and NAD 83 State Plane Coordinates shall be used. All applicable information required for each item on the "Stormwater Electronic Data Submittals - Explanation and Data Sheet" forms should be completed in Microsoft® Excel format and submitted to the Engineer.

1.06 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.

1.07 Submittal

A. At contract closeout, deliver Record Documents to the Engineer for the Owner.

Record Documents

- B. Accompany submittal with transmittal letter, in duplicate, containing:
 - 1. Date
 - 2. Project title and number
 - 3. Contractor's name and address
 - 4. Title and number of each record document
 - 5. Signature of Contractor or Contractor's authorized representative

1.08 Electronic Data Submittal Forms

- A. Project record document forms 01720-3 through 01720-16 are attached to the end of the section.

END OF SECTION

Trenching, Backfilling, and Compacting for Utilities

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Plans and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
 - 1. Excavation of trenches for installation of utilities.
 - 2. Backfilling trenches with bedding material as specified and filling trenches with suitable material to proposed subgrade.
 - 3. Compacting backfill materials in acceptable manner.
 - 4. Borings and casings under roads.
- B. Related Sections:
 - 1. Section 015713 – Erosion and Sedimentation Control
 - 2. Section 329213 – Seeding and Sodding
 - 3. Section 333100 – Sanitary Sewer (Gravity)

1.3 DEFINITIONS

- A. Backfill or Fill: Refer to Section 312000 – Earthwork for definitions of satisfactory soils, structural soil fill, and unsatisfactory soils.
- B. Base Rock: Granular material upon which manhole bases and other structures are placed.
- C. Bedding Material: Class B granular material upon which pipes, conduits, cables, or duct banks are placed.
- D. Borrow or Imported Material: Suitable structural backfill material obtained by Contractor from source(s) offsite. Refer to Section 312000 – Earthwork.
- E. Excavation Classifications: The classification of TRENCH excavation work IS CONSIDERED UNCLASSIFIED unless defined otherwise by the Owner prior to bidding, pricing, and beginning work. Refer to Section 312000 – Earthwork for excavation classifications.
- F. Lift: Loose (uncompacted) layer of material.
- G. Prepared Trench Bottom: Graded trench bottom after excavation and installation of stabilization material, if required, but before installation of bedding material.

Trenching, Backfilling, and Compacting for Utilities

- H. Trench: The word “trench” shall mean excavations having vertical sides whose depths exceed its width, made for storm water drainage, sanitary sewer, water, gas pipes, electric power or lighting, communications, steam conduits, and related uses.
- I. Trench Excavation (unclassified) shall consist of the removal of all materials necessary for the construction of storm sewers, culvert pipes, other pipe lines and all drainage structures such as manholes, catch basins, junction boxes, head walls, wing walls and concrete collars.

1.4 SUBMITTALS

- A. See Specification Section 01 33 23 for requirements for the mechanics and administration of the submittal process.
- B. Report the results of all density tests to the Owner or Owner’s Representative. Include location of test, date of test, note of re-test, test location, depth below finished grade, wet density, moisture content, dry density, percent compaction of test sample, maximum dry density used for comparison, and any other information specified.
- C. Submit a dewatering plan at least 2 weeks prior to starting dewatering work. The Contractor shall remain responsible for the adequacy and safety of the construction means, methods, and sequencing. The plan shall include the following items as a minimum:
 - 1. An equipment list including, but not limited to, pumps and standby equipment.
 - 2. Detailed description for dewatering.
 - 3. Implementation and Monitoring.
 - 4. Erosion and sedimentation control measures and methods for pumped water disposal.

1.5 QUALITY ASSURANCE

- A. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by a Registered Land Surveyor and replaced, as necessary, by same.
- B. Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.
- C. Trench design and safety for pipe and conduit construction is solely the responsibility of the contractor and shall conform to all applicable local, state, and OSHA regulations.
- D. Accurately record actual locations of subsurface utilities, structures, and obstructions installed or encountered.

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- E. Testing shall be the responsibility of either the Contractor or the Owner. Do not bid, price, or begin work on this project until the ownership of this responsibility has been adequately identified and agreed upon by both parties.
- F. Testing shall be performed by a qualified independent geotechnical testing and inspection laboratory to perform soil testing and inspection services for quality control testing during earthwork operations.
- G. Do not bring explosives onto site or use in work without prior written permission from the Owner, Engineer, and authorities having jurisdiction. Contractor is solely responsible for handling, storage, and use of explosive materials when their use is permitted. Provide a pre-blast survey before beginning work.
- H. Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required by authorities having jurisdiction.
- I. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- J. Perform excavation by hand within drip-line of large trees to remain. Protect root systems from damage or dry-out to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with moistened burlap.
- K. Protect improvements on adjoining properties and on the Owner's property. Do not disturb any improvements outside the work area defined on the Plans. Restore damaged improvements to their original condition, as acceptable to parties having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery, storage, and handling of materials shall be in accordance with the Contract Documents and the local, State, and Federal requirements.

1.7 PROJECT CONDITIONS

- A. If available, data in subsurface investigation reports used for the basis of the design are available to Contractor for information only. Conditions are not intended as representations or warranties of accuracy or continuity between soil borings. Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.
- B. Additional test borings and other exploratory operations may be performed by Contractor, at Contractor's option. However, no change in the contract price will be authorized for such additional exploration.

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- C. Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff of services if lines are active. Repair damaged utilities to satisfaction of utility owner.
- D. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning signs, and warning lights as required.
- E. Contractor shall obtain all necessary permits from regulatory agencies including signing and resubmitting Notices of Intent (NOI) and Stormwater Pollution Prevention Plans (SWPPP).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Bedding Material (Class B): Bedding material shall be compacted granular material consisting of well-graded crushed stone or crushed gravel meeting the requirements of TDOT (latest edition), Section 903, Grading Size No. 57 or No. 67.
- B. Backfill Material (Open Areas): Material excavated from trenches or from other on-site sources or borrow (i.e., imported) material from off-site and as defined in Section 312000 – Earthwork as satisfactory soils. Backfill material shall not contain rock or stone with a maximum size greater than 2 inches.
- C. Backfill Material (Paved Areas): Backfill material for pipe under pavement or less than 5 feet from the outside edge of the pavement shall be as specified on the Plans. Based on the reviewing jurisdiction, backfill material shall be either:
 - 1. Mineral aggregate base crushed stone meeting the requirements of TDOT (latest edition), Subsection 903.05, Class A aggregate Grading D.
 - 2. Well-graded crushed stone or crushed gravel meeting the requirements of TDOT (latest edition), Section 903, Grading Size No. 57 or No. 67.
- D. Steel Casing Pipe: Comply with AWWA C200 minimum grade B, size, and wall thickness as indicated on Construction Plans.
- E. Topsoil: Topsoil as defined in Section 312000 – Earthwork.

2.2 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; colored as

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follows:

1. Red: Electric.
 2. Yellow: Gas, oil, steam, and dangerous materials.
 3. Orange: Telephone and other communications.
 4. Blue: Water systems.
 5. Green: Sewer systems.
- B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:
1. Red: Electric.
 2. Yellow: Gas, oil, steam, and dangerous materials.
 3. Orange: Telephone and other communications.
 4. Blue: Water systems.
 5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prior to the beginning of grading, all necessary clearing and grubbing, removal of structures and obstructions, and placement of erosion and sediment controls in that area shall have been completed.
- B. Contact local utility companies before excavation begins.
- C. Maintain in operating condition existing utilities, previously installed utilities, and drainage systems encountered in trenching excavation.
- D. Verify location, size, elevation, depth (by potholing or other approved methods), and other pertinent data required to make connections or to avoid interfering with existing utilities and drainage systems.
- E. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
- F. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
- G. Perform all work so as to cause the least possible inconvenience to the public. Construct temporary bridges or crossings when and where the Engineer deems

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necessary to maintain vehicular or pedestrian traffic.

- H. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- I. Locate excavation support and protection systems clear of permanent construction so that construction and finishing of other work is not impeded.

3.2 EXCAVATION FOR TRENCHES

- A. Excavation within the limits of the project shall be performed to the lines and grades as indicated on the Plans. Excavations carried below the depths indicated, without specific directions, shall, except as otherwise specified, be refilled to the proper grade with satisfactory material as directed by the Engineer.
- B. Open cut excavation with trenching machine or backhoe. Where machines other than ladder or wheel type trenching machines are used, do not use clods for backfill.
- C. Trench design and safety is solely the responsibility of the contractor. Trench excavation sidewalls shall be sloped, shored, sheeted, braced, or otherwise supported by means of sufficient strength to protect workmen in accordance with applicable rules and regulations established for construction by the Department of Labor, Occupational Safety and Health Administration (OSHA), and by local ordinances. Unless regulated otherwise, lateral travel distance to exit ladder or steps shall not be greater than 25-feet in trenches 4-feet or deeper. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.
- D. Unless the construction of lines by tunneling, jacking, or boring is called for by the Plans or specifically authorized by the Engineer, make excavation for pipelines in open cut and true to the lines and grades shown on the Plans or established by the Engineer on the ground. Any cut made in excess of the minimum trench width, formula outside diameter $\frac{4}{3}$ O.D. + 15" or the typical trench dimensions as shown on the Plans shall be at the expense of the Contractor and may be cause for the Engineer to require that stronger pipe and/or a higher class of bedding be used at no cost to the Owner.
- E. Locate and retain soil materials away from edge of excavations. In all cases where materials are deposited along open trenches, place them so that in the event of rain or surcharge loading from such deposits, no damage will result to the work and/or to adjacent property. Do not store within drip line of trees indicated to remain.
- F. Pipe trenches shall not be excavated more than 400 feet in advance of pipe laying and all work shall be performed to cause the least possible inconvenience to the public. Adequate temporary bridges or crossings shall be constructed and maintained where required to permit uninterrupted vehicular and pedestrian traffic.
- G. For work within public right-of-ways and during working hours, the maximum amount of

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exposed pipe trench shall be 50 feet of pipe or two pipe joints, whichever is shorter. During nonworking hours, use one of the following methods of trench protection:

1. Steel plate, minimum 5/8 inch thick, over entire trench or excavation overlapping each pavement edge by 1 foot minimum.
 2. Concrete barriers placed around entire trench or excavation.
 3. Backfill and compact entire trench or excavation.
 4. Cones, barrels, and illumination manned by flagmen.
- H. Trench Bottoms: Accurately excavate and shape trench bottoms to designated elevations, to provide uniform bearing and support for each section of pipe once bedding material is installed at every point along entire length, except where necessary to excavate for bell holes, proper sealing of pipe joints, or other required connections.
1. For pipes 15 inches and smaller, excavate the bottom of the trench 4 inches below the bottom of pipe that is to be installed;
 2. For pipes 18 inches to 36 inches, excavate the bottom of the trench 6 inches below the bottom of pipe that is to be installed;
 3. For pipes 42 inches and larger, excavate the bottom of the trench 8 inches below the bottom of pipe that is to be installed;
 4. Where rock or other unyielding bearing material is encountered, excavate trenches 6 inches below required elevation and backfill with a 6-in. layer of TDOT no. 57 or No. 67 crushed stone prior to installation of pipe bedding;
 5. For bell and spigot pipe, excavate bell holes at proper intervals so that the barrel of the pipe will rest for its entire length upon the bottom of the trench. Bell holes shall be large enough to permit proper jointing of the pipe. Do not excavate bell holes more than 2 joints ahead of pipe laying;
 6. Remove projecting stones and sharp objects along trench subgrade.
- I. Excavation for manholes, inlets, and other incidental structures may be performed with non-vertical banks except beneath pavements or adjoining existing improvements and shall not be greater in horizontal area than that required to allow a 2 foot clearance between the outer surface of the structure and the walls of the adjacent excavation or of the sheeting used to protect it. The bottom of the excavation shall be true to the required shape and elevation shown on the Plans. No earth backfilling will be permitted under manholes, inlets, headwalls, or similar structures. Should the Contractor excavate below the elevations shown or specified, he shall, at his own expense, fill the void with either concrete or granular material approved by the Engineer.
- J. Remove excavated materials not required or not suitable for backfill or embankments and legally waste off-site or on-site at Owner approved locations. Provide other suitable material at no additional cost to Owner. Removal of unsuitable material shall be replaced with No. 57 crushed stone, loosely filled and compacted in 6-inch lifts.

3.3 SHEETING, SHORING, AND BRACING

- A. Where sloping is not possible either because of space restrictions or stability of material excavated, sufficiently sheet, shore, and brace the sides of excavations to

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prevent slides, cave-ins, settlement, or movement of the banks and to maintain the specified trench widths. Use solid sheets in wet, saturated, or flowing ground. All sheeting, shoring, and bracing shall have enough strength and rigidity to withstand the pressures exerted, to keep the walls of the excavation properly in place, and to protect all persons and property from injury or damage.

- B. A Professional Engineer shall design the sheeting, shoring, and bracing system. However, the contractor is solely responsible for the safety of all employees, the effectiveness of the system, and any damages or injuries resulting from the lack or inadequacy of the system. Sheeting, shoring, and bracing shall conform to all applicable local, state, and OSHA regulations. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.
- C. Where excavations are made adjacent to existing buildings or structures or in paved streets or alleys, take particular care to sheet, shore, and brace the sides of the excavation so as to prevent any undermining of or settlement beneath such structures or pavement. Underpin adjacent structures in substantial compliance with Plans sealed by a Professional Engineer wherever necessary. Notify adjacent property owner of the excavation.
- D. Sheeting, shoring, or bracing materials shall not be left in place unless this is called for by the Plans, ordered by the Engineer, or deemed necessary or advisable for the safety or protection of the new or existing work or features. Remove these materials in such a manner that the new structure or any existing structures or property, whether public or private, will not be endangered or damaged and that cave-ins and slides are avoided.
- E. All holes and voids that remain due to the removal of sheeting, shoring, or bracing shall be filled and compacted as specified herein.
- F. A trench box may be used, which is a prefabricated movable trench shield composed of steel plates welded to a heavy steel frame. The trench box shall be designed to provide protection equal to or greater than that of an appropriate shoring system.

3.4 DEWATERING OF EXCAVATION

- A. Prevent surface water and subsurface or groundwater from flowing into excavations and re-route surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
- B. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other de-watering system components necessary to convey water away from excavations.
- C. Provide and keep in operation enough suitable pumping equipment whenever

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necessary. Give special attention to excavations for those structures that, prior to proper backfilling, are subject to flotation from hydrostatic uplift. Dewatering shall occur only in accordance with applicable Laws and Regulations, approved permits, and industry best management practices.

3.5 PIPE BEDDING

- A. Bedding shall be installed by placing bedding material from the trench bottom, for the entire trench width, up to the bottom of the pipe. The middle of the bedding, under the pipe invert, equal to 1/3 of the pipe O.D. should be loosely placed and accurately shaped to conform to the lower portion of the pipe barrel, with the remainder compacted to minimum standard proctor density. Backfill the haunches of the pipe in loose lifts not exceeding 6-inches and compact. Continue backfilling and compacting each lift vertically up to the spring line of the pipe. Material shall be No. 57 (TDOT) crushed stone from below pipe to 8-inches above pipe crown for full trench width.
- B. Do not place bedding material over porous, wet, frozen, or spongy subgrade surfaces.

3.6 BACKFILL AND FILL

- A. Do not backfill trenches until the pipe has been laid to line and grade and properly bedded, tests and inspections have been made, utility systems comply with and are accepted by applicable governing authorities, and backfilling is authorized by the Owner. Use care in backfilling to avoid damage or displacement of pipe or conduit systems.
- B. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces. Backfill evenly and simultaneously on both sides of the pipe up to the subgrade elevation.
- C. Under unpaved areas (i.e., open areas), backfill the trench as follows:
 - 1. For flexible pipe in unpaved areas, the initial backfill above the spring line shall be granular material as specified in Section 2.1 Materials. Place in loose lifts not exceeding 6-inches, compact, and extend to 12-inches above the top of the pipe. The final backfill shall be suitable excavated or borrow (i.e., imported) material as specified in Section 2.1 Materials. Place material in loose lifts not exceeding 6-inches, compact, and extend to the required subgrade elevation.
 - 2. For rigid (i.e., concrete) pipe in unpaved areas, backfill above the spring line with suitable excavated or borrow (i.e., imported) material as specified in Section 2.1 Materials. Place material in loose lifts not exceeding 6-inches, compact, and extend to the required subgrade elevation.
- D. Under paved areas, within 5 feet of pavement edge, and within 10 feet of a building pad backfill above the spring line with granular material as specified in Section 2.1 Materials. Place material in loose lifts not exceeding 6-inches, compact, and extend to the required subgrade elevation.

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- E. Flowable Fill or Controlled Low Strength Material (CLSM): Where indicated on the Plans or as required to expedite trench backfill or to protect pipe, backfill with CLSM or flowable fill above pipe bedding. Do not allow dirt or foreign material to become mixed with concrete during placement. Allow sufficient time for concrete to reach initial set before additional backfill material is placed in the trench. Place in lifts as necessary to prevent uplift (flotation) of new and existing pipes.
- F. Concrete: Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and which are carried below the bottom of such footings, or which pass under wall footings. Place concrete to the level of the bottom of adjacent footing.
- G. Do not allow backfill to free fall into the trench or allow heavy, sharp pieces of material to be placed as backfill until after at least 2 feet of backfill has been provided over the top of pipe.
- H. Before compaction, moisten or aerate each layer as necessary to provide the optimum moisture content. Compact each layer to required percentage of maximum density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice. Adjust moisture content as necessary to obtain specified compaction.
- I. Backfill to the subgrade elevations as determined from the Plans.

3.7 COMPACTION

- A. Exercise proper caution when compacting immediately over top of pipes or conduits. Water jetting or flooding is not permitted as method of compaction.
- B. Mechanically compact each lift (e.g., vibratory sleds, jumping jacks) prior to placing succeeding lifts. Compaction of the haunch layer may require a small tamping mechanism to obtain the specified compaction in a confined area.
- C. Do not use power driven impact type compactors for compaction until at least 4 feet of backfill is placed over top of pipe.
- D. Maintain moisture content within the specified range of optimum of fill materials as specified in Section 312000 – Earthwork to attain required compaction density.
- E. Compact each lift of aggregate backfill to at least 98% of the standard Proctor maximum density (ASTM D 698). In open areas, compact each lift of soil backfill to at least 95% of the standard Proctor maximum density (ASTM D 698).
- F. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by disking, harrowing, or pulverizing, until moisture content is maintained within the specified range of optimum.

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3.8 PLACING AND SPREADING TOPSOIL

- A. Place topsoil uniformly over disturbed areas that do not receive other work. Obtain approval of the finish grading from the Owner before starting to place topsoil.
- B. Level the topsoil so that it slopes uniformly and has no water pockets. Carefully rake the topsoil by hand to remove all clods, roots, sticks, stones over 1 inch in diameter, and other foreign materials from the surface. Dispose of excess excavated materials and debris away from the site.

3.9 FIELD QUALITY CONTROL

- A. Beginning at a depth of 2 feet above the top of the pipe, provide a density test for each lift of compacted fill, at a maximum horizontal spacing of 200 feet, and at all proposed or existing street or pavement crossings. If necessary, excavate to the depth and size as required by the Engineer to allow compaction tests.
- B. The Contractor shall furnish a portion of the job office building at the site for the field technician in charge of making field density determinations. Both electricity and water shall be provided by the Contractor at or near this designated area for the technician's use.
- C. Insufficiently backfilled or compacted areas shall be scarified and loosened to the full depth of fill or otherwise re-worked as necessary to re-compact to the specified density.

3.10 PROTECTION AND CLEANUP

- A. Protect newly graded areas from traffic and erosion, and keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- B. Where subsequent construction operations or adverse weather disturbs completed compacted areas, scarify surface, re-shape, and compact to required density prior to further construction.
- C. Remove waste materials, including unacceptable excavated material, trash and debris, from the Owner's property and legally dispose of it.

END OF SECTION 312333

Part 1 General

1.01 Scope

- A. The work to be performed under this section shall include replacing existing sidewalks and pavement in paved streets, driveways, and parking areas where such sidewalks and pavement have been removed for constructing water pipelines, fire hydrants, sewers, manholes, and all other water and sewer appurtenances and structures. It shall also include temporary paving, and new sidewalks and pavements where applicable.

Part 2 Products

2.01 Types of Pavement

- A. All existing pavement in streets, driveways, or parking areas which is removed, destroyed, or damaged by construction of sewage or water works shall be replaced as specified below, as shown on the Drawings, or as called for in the Bid Schedule. Unless otherwise shown or specified, all paved surfaces shall be replaced using the applicable pavement replacement Type 1 thru 5 as shown on the Drawings. Pavement shown or specified to be replaced for the full width of the street shall be types 6, 7 or 8 as applicable and as shown on the Drawings. Materials, equipment, and construction methods used for paving work shall conform to the Specifications applicable to the particular type required for replacement, repair, or new pavements.
 1. Type 1 portland cement concrete pavement shall be Class "A" concrete conforming to the section entitled "Cast-In-Place Concrete" of these Specifications, having minimum compressive strength of 3500 psi. The surface shall conform to the grade and elevation of the surrounding pavement. The slab shall match depth of existing pavement.
 2. Type 2 - not used.
 3. Type 3 asphaltic concrete pavement for heavy-duty use shall have a maximum thickness of three (3") inches placed in two equal layers. Type 3 pavement shall be composed of plant mix, asphaltic concrete Grading E conforming to "Asphaltic Concrete Surface (Hot Mix)," Section 411, Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, latest edition. The pavement mixture shall not be spread until the designated surface has been previously cleaned and prepared, is intact, firm, properly cured, dry, and the tack coat has been applied.
 4. Type 4 - not used.
 5. Type 5 bituminous penetration pavement shall conform to Section 404, "Double Bituminous Surface Treatment," Tennessee Department of Transportation, Standard Specification for Road and Bridge Construction, latest edition.
 6. Replacement of portland cement concrete driveways shall be Class "A" concrete conforming to the section entitled "Cast-In-Place Concrete" of these Specifications. The surface finish of the concrete pavement shall conform to that of the existing pavement. The

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slab shall be of depth equivalent to the existing concrete pavement, but in no case less than six (6) inches thick. Expansion joints removed shall be replaced.

7. Replacement of portland cement concrete sidewalks shall be Class "A" concrete conforming to the section entitled "Cast-In-Place Concrete" of these Specifications. The surface finish of the concrete sidewalk shall conform to that of the existing sidewalk. The slab shall be of depth equivalent to the existing concrete sidewalk but in no case less than four (4) inches thick. Expansion joints removed shall be replaced.
8. Where sewerage or water lines and appurtenances are constructed in or across unpaved, chert, or crushed stone surfaced streets, roadways, driveways, or parking areas, the surface removed or damaged shall be repaired or replaced with a minimum of six (6) inches of crushed stone in accordance with Section 401, "Mineral Aggregate Surface," of the Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, latest edition.
9. Unless permanent replacement can be made on the same day as the removal of the surface, and traffic is to be reinstated, temporary pavement repairs shall be made with two inches (2") of cold mix or hot bituminous seal coat.

Part 3 Execution

3.1 Replacing Pavement

- A. Pavements removed or damaged shall be replaced in accordance with the following procedures:
 1. The existing street pavement or surface shall be removed along the line of the work for the allowable width specified for the trench or structure. All edges of the existing pavement shall be cut to a straight, vertical edge and care shall be used to get a smooth joint between the old and new pavement and to produce an even surface on the completed street. Cement concrete slabs, cement concrete base slabs and crushed stone bases, if required, shall be placed and the concrete allowed to cure for three (3) days before asphaltic concrete surface courses are applied. Expansion joints where applicable shall be replaced in a manner equal to the original joint.
 2. After the installation of the sewer or water lines, the trench shall be backfilled with thoroughly compacted crushed stone from the top of bedding to finished grade unless otherwise specified on the Drawings. Backfill shall be placed as specified in the section entitled "Earthwork," Paragraph 2.05, of these Specifications.
 3. Trench backfill along streets shall be covered with permanent paving or with a temporary paving as specified above. The temporary paving shall be applied level with the existing paved surface at a time directed by the engineer. Prior to the application of the temporary paving the crushed stone backfill shall be maintained carefully at grade and dust free. Additionally, immediately prior to application of permanent paving by Contractor or acceptance by the City, Contractor shall again compact the top of all trench backfill in the streets with a hydrotamper and add sufficient crushed stone to bring surface back to bottom of permanent paving as shown on Drawings.

4. Unless otherwise shown or specified, all paved surfaces shall be replaced with pavement of like kind as specified in Paragraph 2.01. The pavement shall be either specified trench width or the full width of the street as shown in the Bid Schedule.
5. Where pavement is specified for trench width only, the temporary surface or sub-base for permanent paving shall be compacted and finished to the base grade compatible with the type of pavement to be applied before pavement is placed. Additional width of pavement to be removed, if any, as shown on the drawings shall be done immediately prior to replacing the pavement. Any additional pavement or street surface removed or damaged beyond the limits shown on the Drawings shall be replaced or repaired by the Contractor at the Contractor's expense.
6. Where the pavement is for the complete width of the street, the following procedures shall be used;
 - a. After the crushed stone backfill and temporary surface have settled thoroughly, the entire width of the street to be paved shall be cleaned of loose materials as specified in Section 407, "Bituminous Plant Mix Pavements," Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, latest edition. All areas which have settled shall be filled and leveled as described above in Paragraph 3. Manholes shall be raised to match finished grade using precast concrete rings. Before paving a tack coat shall be applied to the full width of the street, as specified in Section 403 "Tack Coat," Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, latest edition.
 - b. During the time that the full width of the street is being paved, the Contractor shall extend the paving from the street into existing paved driveways in order to provide a smooth transition from the street to the existing driveway grade. This work shall be completed to the satisfaction of the Engineer with no separate payment being allowed.
7. Wherever sewer or water lines are constructed across state highways, the Contractor shall comply with all requirements and provisions of the Standard Method of the Tennessee Department of Transportation for opening trenches through highways and replacing pavements as shown on the Drawings and specified herein. All such work shall be subject to inspection and approval by the Tennessee Department of Transportation.
8. Contractor shall remove all surplus excavation materials and debris from the street surfaces and rights-of-way and shall restore street, roadway or sidewalk surfacing to its original condition. This work shall be considered as cleanup and no separate payment will be made for this item.

3.2 New Pavements

- A. Access roads, parking areas, and other roadways shall be surfaced as shown on the Contract Drawings. The material shall be placed sufficiently thick to produce, after compaction, a uniform surface with a minimum thickness as shown on the drawings and shall be shaped to the required line and grade. Materials, equipment and construction methods used for paving work shall conform to the Specifications for the particular surface required.

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- B. Bituminous penetration pavement, Portland Cement Concrete base course or pavement and bituminous concrete pavement shall include a base course constructed in accordance with the requirements of Section 303, "Mineral Aggregate Base," Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, latest edition. The completed crushed stone road base shall be maintained by the Contractor in a smooth, first-class condition to required line, grade and cross section until the entire surface area has become stabilized and compacted. Roadway materials shall not be placed on soft, wet or frozen sub-grade.
- C. After the base has become stabilized, the entire surface shall be covered with the surface course called for on the Drawings. The surface course shall not be placed until all other items of work are completed.
- D. Portland Cement Concrete base course or pavement shall be placed as herein specified in this Section. Asphaltic concrete pavement shall be placed as specified in Paragraph 2.01. Bituminous penetration surface shall be constructed in accordance with Section 404, "Double Bituminous Surface Treatment," Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, latest edition.
- E. Crushed stone surface shall be placed as herein specified in this section, Paragraph 2.01.

3.3 Maintenance

The Contractor shall maintain the surfaces of roadways built and pavements replaced until the acceptance of the project. Maintenance shall include such dragging, reshaping, refilling, wetting, rerolling, and reapplication of the temporary paving surface as are necessary to prevent raveling of the road material, the preservation of reasonably smooth surface and repair of damaged or unsatisfactory surfaces to the satisfaction of the Engineer. Maintenance shall also include sprinkling as may be necessary to abate dust. All pavements and structures shall be swept clean of all dirt or rubbish which may have become deposited upon them during construction.

3.4 Sidewalk Replacement

A. MATERIALS

- 1. All concrete sidewalks shall be built and/or replaced with Class "A" concrete which shall conform with requirements of the section entitled "Cast-in-Place Concrete" of these Specifications.
- 2. Preformed joints shall be 1/2-inch thick conforming to the latest edition of AASHTO Standard Specifications, M59, for preformed bituminous fiber joints.
- 3. Concrete forms shall be of wood or metal, shall be straight and free from warp, and shall be of sufficient strength when in place to hold the concrete true to line and grade without springing or distortion.

- B. When a section of sidewalk is removed, the existing sidewalk shall be cut to a neat line perpendicular to both the centerline and the surface of the concrete slab. Existing concrete shall be cut along the nearest existing contraction joints unless such joints do not exist in which case the cut shall be made at minimum distances shown on the Drawings.

- C. Existing concrete sidewalks that have been cut and removed for construction purposes shall be replaced with sidewalks of the same width and surface as the portion removed and shall have a minimum uniform thickness of four (4") inches. The new work shall be neatly joined to the old concrete so that the surface of the new work shall form an even unbroken plane with the old sidewalk.
- D. The subgrade for concrete sidewalks shall be formed by excavating to a depth equal to the thickness of the concrete plus two (2) inches. Subgrade shall be of such width as to permit the proper installation and bracing of the forms. Subgrade shall be compacted by hand tamping, or rolling. Soft, yielding, or unstable material shall be removed and backfilled with satisfactory material. Two (2") inches of porous compacted crushed stone shall be placed and shall be compacted thoroughly and finished to a smooth, unyielding surface at proper line, grade, and cross section.
- E. Expansion joints shall be required to replace any existing expansion joints that are removed with the sidewalk or in new construction wherever shown on the Drawings. Expansion joints shall be true and even, shall present a satisfactory appearance, and shall extend to within one-half (1/2") inch of the top of finished concrete surface.
- F. Concrete shall be suitably protected from freezing and excessive heat. It shall be kept covered with burlap or other suitable material and kept wet until cured.

3.5 Curb Replacement

- A. All existing curbs which are removed, damaged, or destroyed during construction of sewerage or water works shall be replaced in accordance with the following:
 - 1. Asphaltic concrete curbs shall be constructed with the same dimensions as the existing curb using asphaltic concrete pavement Grading E, conforming to the section entitled "Asphaltic Concrete Pavement." Prior to constructing curbs on pavement, the pavement shall be dry and cleaned of loose material and a tack coat of RS-2 asphalt shall be applied to the curb area of the pavement at the rate of 0.08 to 0.20 gallons per 15 linear feet of curb area.
 - 2. Portland Cement Concrete curbs shall be constructed with the same dimensions as the existing curb using Class A concrete in accordance with the sections entitled "Cast-In-Place Concrete" and with Section 702, "Cement Concrete Curb," Tennessee Department of Transportation, Standard Specifications for Road and Bridge Construction, latest edition.

END OF SECTION

Part 1 General

1.01 Scope

- A. Topsoil for planting shall consist of a rich friable soil conforming to the requirements and provisions set out in these Specifications, stipulated in special provisions, or as approved by the Engineer, and obtained from locations indicated on the Plans, stipulated in Special Provisions, or as approved by the Engineer. Topsoil shall be placed at the locations indicated on the Plans set out in the Specifications or as directed by the Engineer, and in conformity with the provisions and requirements set out in the Specifications or as required by the Engineer.
- B. The topsoil within the construction corridor crossing the golf course shall be removed, stockpiled and reused.

Part 2 Products

2.1 Material

- A. Topsoil for planting shall be a rich friable loam containing a large amount of humus and shall be original surface sandy loam, topsoil 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 perennial wood seeds, and shall not contain objectionable plant material, toxic amounts of either acid or alkaline elements or vegetable debris undesirable or harmful to plant life. Bermuda grass roots in topsoil will not be accepted, unless otherwise approved by the Engineer.
- B. Topsoil shall be natural topsoil without admixture of subsoil material and shall be classifiable as a loam, silt loam, clay loam, or a combination thereof. Topsoil shall contain not less than five percent nor more than 20 percent, by weight, of organic matter as determined by loss on ignition of oven-dried samples. The ignition test shall be performed on samples which have been thoroughly oven-dried to constant weight at a temperature of 221 degrees F.
- C. 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.
- D. 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 in commercial quantities, the product will be homogeneous in nature and will conform to the requirements of these Specifications, or as required by the Engineer.
- E. Topsoil may be secured, if approved by the Engineer, from areas which are, or have been, in cultivation within the past five years, and which are producing or have produced fair or good yield of staple farm or truck crops without usual fertilization, or topsoil may be secured from areas supplied with good normal drainage which is arable or suitable for cultivation.

2.2 Equipment

- A. All equipment necessary for the proper removal, transportation, protection, and maintenance of topsoil must be available when required in first class working condition and shall have been approved by the Engineer before construction will be permitted to begin.

Part 3 Execution

3.1 General

- A. Topsoil, except that reserved within excavation areas on the project, shall not be stored for use but shall be excavated and placed directly into its final position.
- B. 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.
- C. 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 materials shall be removed from the topsoil, or, if required by the Engineer, the pit shall be abandoned.
- D. Before placing or depositing topsoil upon any areas, all improvement within the area shall be completed, unless otherwise approved by the Engineer.
- E. The areas or pits into which topsoil is to be placed or incorporated shall be prepared before securing topsoil for use.
- F. The depth to which topsoil is excavated in any pit, shall be subject to the direction of and be approved by the Engineer, and if during the excavation of the pit the Engineer decides to make changes in the depth in order to secure a more satisfactory material, the Contractor shall follow such instructions as may be issued by the Engineer.
- G. Topsoil shall be transported in vehicles which will not lose or scatter the topsoil during transportation.
- H. Topsoil shall be placed upon or incorporated into prepared areas or pits in accordance with the provisions and requirements set out in the sections of these Specifications covering the particular type or kind of planting or seeding with which topsoil is required.
- I. The Topsoil reused on the golf course shall be compacted and evenly graded to the satisfaction of the Chattanooga Golf and Country Club Course Manager. Topsoil shall be free of rocks, clumps, sticks, debris, etc. The final grade shall match the preconstruction grade and shall be level with existing turf and the topsoil/turf interface.

3.2 Maintenance

- A. The Contractor shall maintain topsoil, at his own expense, in connection with any seeding or planting, or otherwise, until final completion of the project. Maintenance shall consist of preserving, protecting, replacing, and such other work as may be necessary to keep the project in a satisfactory condition.

3.3 Final Cleaning Up

- A. Final cleaning up shall consist of completely cleaning the area of all equipment, rubbish, excess material, and unused materials which will mar the appearance of the project, and disposing of same satisfactorily.
- B. All pavements and structures shall be swept clean of all dirt or rubbish which may have become deposited upon them during construction.
- C. In addition, final cleaning up shall be performed in accordance with Section 01 74 00.

END OF SECTION

Part 1 General

1.1 Work Included

- A. The work covered by this section shall include the establishment or restoration of all ground cover including areas to be seeded and/or sodded. This work shall include the supply of all materials, labor, superintendence and maintenance as outlined in these specifications.

1.2 Related Work

- A. Section 31 23 33 – Trenching, Backfilling, and Compacting for Utilities
- B. Section 32 91 13 – Furnished Top Soil
- C. Section 01 57 13 – Erosion and Sediment Control

1.3 Scope of the Work

- A. Restoration of Lawns and Grasses by seeding and/or sod placement shall be performed on all areas that are not occupied by structures, roads, curbs and gutters, sidewalks, and concrete slab walls, etc.

Part 2 Products

2.1 Seed

- A. Fescue Seed Mix (for areas disturbed by construction operations, not otherwise planted with sod, or shrubs): Seed shall be true to name and meet the specifications in TDOT Section 801. Final selection of seed mix shall be coordinated with the Heritage Landing HOA Property Manager and the CGCC Course Manager.
- B. All seed shall be fresh and clean and shall be delivered mixed, in unopened packages, bearing a guaranteed analysis of the seed and mixture.

2.2 Sod

- A. Sod shall be bluegrass or fine fescue sod strongly rooted and free of pernicious weeds. It shall be a uniform thickness of not more than 1-½ inches and shall have not less than ¾ inches of soil. All sod shall be grown on a commercial turf farm and no pasture sod shall be acceptable. The source of the sod must be approved by the Engineer before it is cut for delivery.
- B. The sod shall be delivered and installed within 48 hours of being harvested by the producer.

2.3 Fertilizer

- A. A complete commercial fertilizer with a 1:2:2 ratio of nitrogen, phosphorus, and potassium shall be furnished. It shall be free flowing and suitable for application with approved equipment. The material shall conform to State fertilizer laws. Bagged fertilizer shall be delivered in sealed standard containers and shall bear the name, trademark, and warranty of the producer.

2.4 Lime

- A. Lime shall be agricultural grade limestone crushed so that no less than 85% will pass a No. 10 sieve.

Part 3 Execution

3.1 Sequence of Work

- A. All finish grading in a general area shall be complete before fertilizing and seeding or sodding begins.

3.2 Soil Preparation and Seeding

- A. The work consists of furnishing all labor, equipment, and materials in all operations in connection with the fertilizing and seeding of all the finished graded areas not occupied by structures, roads, concrete slabs, sidewalks, walls, etc., and including grassed areas destroyed or damaged by the Contractor.
- B. The areas to be seeded shall be thoroughly tilled to a depth of at least 4 inches by discing, harrowing, or other approved methods until the condition of the soil is acceptable to the Engineer or, in the event of work on an existing utility easement, to the satisfaction of the easement holder. After harrowing or discing, the seed bed shall be dragged and/or hand raked to finish grade.
- C. The incorporation of the fertilizer and the agricultural lime may be a part of the tillage operation and shall be applied not less than 24 hours nor more than 48 hours before the seed is to be sown. Fertilizer shall be applied at a rate to provide not less than 2 ½ pounds of nitrogen, 5 pounds of phosphorus, and 5 pounds of potash per 1,000 square feet. Agricultural limestone shall be applied at a rate of not less than 100 pounds per 1,000 square feet.
- D. Seed shall be broadcast either by hand or approved sowing equipment at the rate of ninety pounds per acre (two pounds per 1,000 square feet), uniformly distributed over the area. Broadcasting seed during high winds will not be permitted. The seed shall be drilled or raked into a depth of approximately ½ inch and the seeded areas shall be lightly raked to cover the seed and rolled. Drill seeding shall be done with approved equipment with drills not more than 3 inches apart. All ridges shall be smoothed out, and all furrows and wheel tracks shall be removed.
- E. Group A seed shall be used for seeding from February 1 to August 1, and Group B seed shall be used from August 1 to December 1, except that either Group A or B may be used during the month of August.

- F. Seeding shall be performed only when the soil is in a tillable and workable condition, and no seeding shall be performed between December 1 and February 1 unless otherwise permitted.
- G. Seed may not be sown at any other time except with the written approval of Owner.
- H. After the seed has been sown, the areas so seeded shall be mulched with clean straw at the rate of one bale per 2,000 square feet (approximately 1-inch loose depth). Mulch on slopes exceeding 20% shall be held in place with binder twine staked down at approximately 18-inch centers or by other equally acceptable means.
- I. Areas seeded shall be protected until a uniform stand develops, when it will be accepted and the Contractor relieved of further responsibility for maintenance. Displaced mulch shall be replaced or any damage to the seeded area shall be repaired promptly, both in a manner to cause minimum disturbance to the existing stand of grass. If necessary to obtain a uniform stand, the Contractor shall fertilize, seed, and mulch again as needed. Scattered bare spots up to one square yard in size will be allowed up to a maximum of ten percent (10%) of any area.

3.3 Soil Preparation and Sod Placement

- A. This work consists of furnishing all labor, equipment, and materials and all operations in connection with the placement of sod on all of the finished graded areas not occupied by structures, roads, concrete slabs, sidewalks, walls, etc., and including grassed areas destroyed or damaged by the Contractor.
- B. The areas where sod is to be placed shall be thoroughly tilled to a depth of at least 4 inches by discing, harrowing, or other approved methods until the condition of the soil is acceptable to the Engineer or, in the event of work on an existing utility easement, to the satisfaction of the easement holder. After harrowing or discing, the sod bed shall be dragged and/or hand raked to 1/2" below finish grade.
- C. The incorporation of the fertilizer and the agricultural lime may be a part of the tillage operation and shall be applied not less than 24 hours nor more than 48 hours before the sod is to be placed. Fertilizer shall be applied at a rate to provide not less than 2 1/2 pounds of nitrogen, 5 pounds of phosphorus, and 5 pounds of potash per 1,000 square feet. Agricultural limestone shall be applied at a rate of not less than 100 pounds per 1,000 square feet.
- D. Prior to the sod being placed, the area to be sodded shall be lightly watered to moisten the soil surface. The sod shall be carefully unrolled and trimmed to fit irregular areas, with the edges of the sod strips placed tightly together in such a manner as to conceal the joints between the strips. Following placement, the sod shall be lightly watered (approximately a 1/4" application) and rolled with a medium weight lawn roller to minimize any ridging at the seams.
- E. Sod may be placed whenever the sod is not dormant, and the ground is not frozen or muddy. Sod may not be placed at any other time.
- F. For a period of first two weeks following placement, the sod shall be maintained by thoroughly watering the entire area covered by the sod every second day, with a 1/2" minimum application by sprinklers or a misting hose. Lawn watering gauges shall be used to measure the application. Flooding or sheet watering will not be allowed. For the third

through sixth weeks following placement, the sod shall be maintained by thoroughly watering the entire area covered by the sod twice weekly (three to four days apart), with a 1/2" minimum application by sprinklers or a misting hose. Lawn watering gauges shall be used to measure the application. Flooding or sheet watering will not be allowed.

- G. Actual rainfall event amounts received during the period of watering may be counted towards the required application totals when the amount of the rainfall exceeds 1/4" per event.
- H. In the third through sixth week following placement, the Contractor shall maintain the sodded areas by mowing to a height of not less than three inches, prior to water applications. Contractor shall not allow sod blade height to exceed five inches during this period.
- I. Following the six-week watering period, the area covered by the sod will be rolled one additional time with a medium weight lawn roller, and shall be inspected by the Owner for acceptance.

END OF SECTION

Preconditioning and Cleaning of Underground Sewer Pipelines

Part 1 General

1.1 Scope

The work covered by this Section includes furnishing all labor, material, equipment and services required for cleaning all sewer pipelines, prior to inspection of the sewers, by closed circuit television, authorized by the Engineer, as shown on the Drawings and/or specified herein. 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, intruding laterals and any other extraneous debris.

1.2 Definition

The term "clean" as used in this Section, shall mean removing all sand, dirt, roots, grease and all other solid or semi-solid materials from the sewer pipelines, so that a closed circuit television camera can be used in the internal pipeline inspection for the purpose of discerning structural defects, misalignment and infiltration/inflow sources.

"Heavy Cleaning" shall be defined as the pipe being more than 25% full of debris or requiring the use of apparatus other than normal high-pressure jetting equipment (i.e. buckets, "pigs", power-rod machines, grinders, or dragging devices). The Contractor shall be paid for "Heavy Cleaning" on the basis of the distance loosened debris is moved to the nearest point of extrication from the sewer. Payment shall be calculated on a lineal foot basis and be paid in addition to the normal cleaning rate shown on the bid form. "Heavy Cleaning" must be pre-approved by the Engineer.

Part 2 Products

2.1 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 24 hours in the event of equipment breakdown.
- B. Prior to the commencement of work, the Contractor shall coordinate access to water with the local water utility. Water will not be furnished by the Owner.
- 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 and the utility providing the water prior to

commencement of work. All equipment, labor, and material required for obtaining water for the work shall be provided by the Contractor. The Contractor must ensure that a 6 inch minimum air gap is maintained at the water supply point on desilting/cleaning/jetting equipment or any other receiving apparatus used to obtain water from the utility's hydrants.

Part 3 Execution

3.1 Cleaning

- A. Cleaning will be accomplished by utilizing a high pressure, hydraulic sewer pipeline cleaner. Pressure jetting equipment used shall be sufficient for the purposes of attaining the degree of cleanliness in sewers as specified.
- 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; minimal hose diameter shall be 1 inch.
- C. The Contractor's rates specified in the Proposal Forms shall be for 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. Ideally 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. Cleaning shall be done immediately prior to the internal inspection to preclude the build-up of debris from infiltration/inflow sources and upstream manhole sections. Should television inspection reveal that a sewer pipeline is not clean; the cleaning operations shall be repeated until the sewer pipeline is clean. This additional cleaning shall be done at the expense of the Contractor, at no additional cost to the Owner.
- F. During preconditioning and cleaning work and all other associated Contract operations, sewer services shall be maintained at all times. This requirement may be relaxed only with the written approval of the Engineer.
- G. 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 proposal provisions for dealing with such variations, and where necessary, schedule his Work to accommodate such variation in flows.
- H. Cleaning shall include the trapping and removal of all sediments and residual wastes from successive manholes as the cleaning progresses. When hydraulic cleaning equipment is used, a suitable weir or dam shall be constructed in the downstream manhole, in such a manner, that the solids and water are trapped. Under no

circumstances shall sewage or solids removed there from, be dumped onto streets, in catch basins or in storm drains. Material which could cause pipeline stoppages, accumulations of sand in wet wells, or damage to pumps, shall not be permitted to pass from manhole section to manhole section. The cost of trapping, removing, hauling and disposing of the residual wastes shall be included in the cost of cleaning. Disposal of residual wastes shall be in accordance with, and at a location approved by the Engineer and the Owner.

- I. The Contractor shall provide for the pumping down of any surcharged manhole section and provide all bypass pumping, if required, during the cleaning operation. All bypass pumping shall be approved by the Engineer.
- J. The Contractor shall submit a comprehensive equipment list to the Engineer before commencement of the Work. The complete list, which shall include all backup and standby equipment, shall be broken down into the following categories (at a minimum):
 - 1. Safety equipment
 - 2. Manhole preconditioning and cleaning equipment
 - 3. Sewer preconditioning and cleaning equipment
 - 4. Flow diversion and flow control equipment
 - 5. Traffic control equipment
 - 6. All other equipment necessary for the completion of the work.
- K. Blockages in the system shall be reported to the Engineer immediately.
- L. 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.

3.2 Precautions

- A. The Contractor shall take all necessary precautions to ensure that water used does not flood property or buildings served by the sewer pipeline being cleaned.
- B. No fire hydrant shall be obstructed, in case of a fire in the area served by the hydrant.
- C. The Contractor shall take all necessary precautions to protect the sewer pipelines from damage that might be inflicted by improper use of cleaning equipment and shall repair, at no cost to the Owner, any damage caused by the cleaning operation.
- D. The Contractor shall furnish, to the Owner, certification of the accuracy of the automatic counter before any work shall begin on this Project. If, at any time, the Engineer has reason to believe that the counter is inaccurate, the calibration of the

counter will be checked before any more work progresses.

- E. The Contractor shall provide, operate, maintain and subsequently remove on completion, adequate ventilation apparatus in the form of blowers 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.
- F. 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.
- G. The Contractor shall inform the Engineer before the commencement of any portion of the work of any significant change in the methods of noise attenuation from those previously approved.
- H. All pumps, generators, combination cleaners or other noise emitting equipment shall be suitably screened to minimize nuisance and noise pollution. This requirement shall not be taken as preventing or prohibiting the execution of work necessary for the saving of life, protection of property, or safety of the personnel and/or facilities. The Contractor shall notify the Engineer of such use of plant or equipment in an emergency situation as soon as practicable.

3.3 Data Collection

- A. The Contractor shall complete a cleaning report for each sewer segment cleaned. A hard copy of this report shall be furnished on a weekly basis to the Engineer. The information required on the cleaning report shall be as follows:
 - 1. Location, size and condition of sewer line. Location will be indicated by road name, intersection(s) and GPS coordinates. Size will be indicated by nominal internal diameter. Condition will be indicated by narrative describing visual observation and the items below, augmented by photos where needed.
 - 2. Degree and nature of deposits prior to cleaning.
 - 3. Length of sewer cleaned.
 - 4. Estimated amount and types of debris and sediment removed. Indicate approximate location
 - 5. Grease build-ups. Indicate approximate location.
 - 6. Structural failures. Indicate approximate location.
 - 7. Blockages. Indicate percent blockage or free area,

8. Method and man hours actually expended for cleaning.

END OF SECTION

Closed Circuit TV Inspection of Existing Underground Sewer Pipelines

Part 1 General

1.1 Scope

The work covered by this Section includes furnishing all labor, materials, equipment and services required to perform the closed circuit television (CCTV) inspection of the specific sewer pipelines authorized by the Engineer.

1.2 Definition

"Internal inspection" shall consist of using a closed circuit television within a designated sewer pipeline segment to detect point sources of infiltration/inflow or exfiltration and to determine the physical condition of the sewer pipeline.

1.3 CCTV Camera Operator Certification Requirements

- A. The Contractor will provide current certification that operators conducting CCTV inspections have undergone National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP[®]) training prior to commencement of inspection activities. Defect coding, as well as material, shape, and lining coding used throughout the project will conform to NASSCO PACP standards version 6.0.2.
- B. Each operator must have at least 5 years experience in the coding of CCTV inspections and must have reported upon more than 250,000 feet of CCTV. The Contractor must use NASSCO certified data collection software (PACP version 6.0.2), with final approval by the Engineer prior to the start of the Contract.

Part 2 Products

2.1 Television Equipment

- A. The camera unit shall be a color pan and tilt unit. The television camera shall have a resolution of 700 lines minimum and shall have a source of illumination attached to it. 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. 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 inspection. In order to ensure color constancy, no variation in illumination shall take place during the inspection. The televised image shall be displayed on a monitor, located in an enclosed space in the television inspection vehicle.
- B. 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.

- C. The camera shall be self-propelled or mounted on skids and drawn through the sewer by winches for pipelines with an equivalent diameter from 6 to 36 inches. The inspecting equipment shall be capable of inspecting a length of sewer up to at least 1,000 ft. when entry into the sewer may be obtained at each end and up to 750 feet 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 Engineer at the commencement of each working shift that all items of equipment have been provided and are in full working order.
- D. Each inspection unit shall contain a means of transporting the CCTV camera equipment in a stable condition through the sewer under inspection. Such equipment shall ensure the maintained location of the CCTV camera on or near to the central axis of a circular shaped sewer when required in the prime position.
- E. Where the CCTV camera head 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 CCTV camera and/or Sonar equipment. All winches shall be inherently stable under loaded conditions.
- F. Each unit shall carry sufficient numbers of guides and rollers such that, when inspecting, all bonds are supported away from pipe and manhole structures and all CCTV cables and/or lines used to measure the CCTV camera's head location within the sewer are maintained in a taut manner and set at right angles where possible, to run through or over the measuring equipment.
- G. The Contractor shall use a suitable metering device, which enables the cable length to be accurately measured; this shall be accurate to within +/- 2 inches. When requested by the Engineer in writing at any time during a survey or inspection, the Contractor shall demonstrate compliance with the above tolerance. The device used by the Contractor to measure the footage along the sewer will be compared with a standard tape measure. The results will be noted. 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.
- H. The in-sewer photographic/video camera system and suitable illumination shall be capable of providing an accurate, uniform and clear record of the sewer's internal condition. In-sewer lighting standards shall meet the requirements of the designated Engineer and applicable codes regarding safety and power.
- I. A reserve television camera shall be available to replace the regular television camera in the event of a breakdown. Should the reserve equipment malfunction, another camera shall be provided within 24 hours.
- J. Suitable flow control devices shall be plugs designed and manufactured for use in sanitary sewers. Sand bags or other types of devices shall not be used within sanitary

sewer pipelines or manholes.

2.2 Television Equipment Operation

Operation of the television inspection equipment shall be controlled from above ground, with a skilled technician at the control panel in the television inspection van controlling the movement of the television camera. The technician shall have the capability to: adjust the brilliance of the built-in lighting system; change the focus of the television camera by remote control; control the pan and tilt feature of the camera; control the forward and reverse motion of the camera; and determine the camera's position, at any time. Operators of the television inspection equipment shall meet the requirements stated in Section 1.03 of this Specification.

Part 3 Execution

3.1 Procedure

The television inspection shall be performed in one section of the sewer pipeline at a time, between adjacent manholes. The inspection shall be performed by pulling or propelling the television camera through the section of the sewer along the axis of the pipeline. A position tolerance of $\pm 10\%$ of the vertical sewer dimension will be allowed. The inspection shall be performed in a forward and/or backward direction, as dictated by the pipeline conditions at the time of the inspection. During the inspection of the sewer pipeline, every possible means shall be taken to ensure total viewing of the inside periphery of the pipeline. The inspection shall be conducted in such a manner as to determine that the line is clean and to locate all leaking joints, breaks, defects and faults in the pipeline. Television camera movement shall be temporarily halted at each defect in order to pan or tilt the camera head and observe the full extent of the defect in detail, and to allow for a clear photograph of the defect. Camera movement will not resume with visible point sources of infiltration/inflow until the leakage rate from the source is quantified. The camera shall also be stopped at service connections where flow is discharging. If the discharge persists, the property involved shall be checked, at the ground surface level, to determine whether or not the discharge is wastewater. If checking determines that the discharge is not wastewater, it shall be considered infiltration/inflow. The leakage rate of each infiltration/ inflow source shall be estimated in gallons per day (gpd).

3.2 Provisions

- A. The Contractor shall maintain on site at all times a competent field supervisor in charge of the inspection. 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.
- B. The Contractor shall provide bypass pumping, where necessary, to prevent flooding or sanitary sewer overflows.
- C. The Contractor shall provide for the pumping down of any surcharged manhole

section, if required, before television inspection commences. Bypass pumping must be approved by the Engineer prior to set up.

- D. The Contractor shall furnish, to the Owner, certification of the accuracy of the automatic counter before any work shall begin on the Project. If, at any time, the Engineer has reason to believe that the counter is inaccurate, the calibration of the counter will be checked before any more work progresses.
- E. CCTV Camera Head Speed: The speed of the CCTV camera in the sewer shall be limited to 30 feet per minute for inspections to enable all details to be extracted from the final video recording.
- F. At the start of each sewer length being surveyed or 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 inspection shall be indicated in the final report. All reverse set-ups, blind manholes, and buried manholes shall be logged on a separate log. Each log shall make reference to a start (ST) and finish (FH) manhole unless abandonment took place because of blockage.
- G. Should the Contractor encounter a buried manhole during the course of inspection that cannot be readily accessed, the Contractor shall notify the Engineer, and shall make note of such in the appropriate field on the inspection header.
- H. If during the course of CCTV Inspection, a protruding tap is discovered in the pipeline that will not allow the passage of a CCTV inspection camera and a reverse setup cannot be completed, then the Contractor will be required to remove the protruding tap via a remotely controlled robotic cutting device. Prior to removing the protruding tap, the Contractor must receive approval from the Engineer.
- I. If for any reason the camera becomes disabled inside the sewer and cannot further proceed, the Contractor shall be responsible for retrieving the camera at no additional cost to the Owner.
- J. All digital video shall be continuous with no evidence of missed footages or "blink-outs." That the entire pipeline segment was traversed and inspected shall be obvious on the final video recording.
- K. Prior to inspection, each length of sewer shall be cleaned pursuant to Specification 33 01 30.14. All inspected pipe should be free of debris to allow for a complete, unobstructed view of the pipe. If upon viewing a final inspection, the Engineer deems that the view is obstructed, the pipe will be cleaned and re-televised at no cost to the Owner.

3.3 Data Collection

- A. The Contractor shall furnish all equipment and software required for taking photographs and videos of the view which appears on the monitor. Digital Video will be used to record all point sources and defects, severe leaks, holes, collapses, misalignments, etc. Still pictures shall be taken of all coded observations. Data

logging and defect coding conforming to the NASSCO PACP will be required as part of all pipeline inspections.

- B. All inspection information shall be captured utilizing NASSCO certified data collection software and following all NASSCO PACP (version 6.0.2 or greater) standard data fields, formats, and conventions provided by the Engineer.
- C. All inspection media file naming formats and folder organizational structures must remain consistent throughout all internal inspections. See naming conventions in Section 3.04, Part E.
- D. A digital encoded inspection video shall be continuously captured for the entire length of each inspection. All digital encoded inspection video files shall be in MPEG-1 file format. For all digital encoded inspection videos, the file naming format shall be generated using a concatenation of standard PACP database fields in the format "Upstream_MH"_"Downstream_MH"_"Direction"_"Date"_"Time". CCTV inspections in which the camera lens is or becomes obstructed, dirty, greasy, etc. during the inspection, and remains so for up to two (2) feet, will not be accepted.
- E. A digital still image shall be captured for each coded observation. All digital still images shall be in JPEG file format. For all digital still images, the file naming format shall be generated using a concatenation of standard PACP database fields in the format "InspectionID"_"ConditionID"_"Distance"_"PACP_Code".
- F. Each digital encoded inspection video shall begin with the camera facing towards the bottom of the manhole and oriented so that the outgoing sewer connection is at the 6 o'clock position. This position shall be held during video recording for a minimum of five (5) seconds prior to lowering the camera to the bottom of the manhole. Once the camera has been lowered into the manhole and oriented in its direction of travel, the camera shall be directed towards the top of the manhole, with this position held during video recording for a minimum of five (5) seconds prior to advancement into the sewer.
- G. A comprehensive summary inspection report shall be generated for each inspection, and shall be in Portable Document Format (PDF). The report shall include the findings on major defects, including but not limited to fractures, displaced joints, deformation, corrosion, lateral intrusions, and dominant surface features including encrustation and silt depths. All pdf report files shall be in a dedicated folder called "PACP_Reports"
- H. Each sewer length (the length of the sewer between two (2) consecutive manholes) will be entered into the PACP database field "Total_Length". If field maps are provided for the project area and include a total length, then this value will be entered into the field "Total_Length".
- I. When a length of sewer between two (2) consecutive manholes cannot be inspected for practical reasons, the reason for abandonment shall be described in the PACP database field "Additional_Info". At unmapped manholes, a new inspection will be started and the footage re-set to zero (0.0).
- J. When the Contractor elects to "pull through" a manhole during a CCTV and/or Sonar Inspection, a new inspection will be started at the manhole "pulled through", and the

footage re-set to zero (0.0) at the manhole wall where the pipe exits/enters the manhole.

- K. When a reverse or second inspection is required to complete the inspection of a sewer, the PACP database field "Reverse_Setup" shall be populated with corresponding inspection number. The "Reverse_Setup" field shall be null for all inspections that are not reverse or follow-up inspections.
- L. When an unmapped manhole is discovered during an inspection, the Contractor shall assign a temporary field-assigned ID to the manhole. This temporary field ID shall be entered into the appropriate PACP database field (either "Upstream_MH" or "Downstream_MH"), and the comment "Unmapped MH" shall be entered in the PACP database field "Additional_Info". The inspection shall be terminated and a new inspection shall begin, so that the unexpected manhole effectively divides the pipe into two segments. The "Total_Length" field for the terminated inspection shall be populated with the distance in feet at which the unexpected manhole was discovered during inspection. The pipe segment receiving the next inspection shall be assigned a temporary field ID, and the newly-discovered manhole ID shall be entered into the corresponding "Upstream_MH" or "Downstream_MH" field. The proposed naming scheme for unmapped manholes and pipes shall be approved by the Engineer prior to start of inspections. The Contractor shall ensure that each newly-discovered manhole and pipe is given an ID that is not already assigned to another manhole or pipe. The contractor shall also ensure that the field-assigned ID of each newly-discovered manhole is consistent between PACP and MACP submittals.
- M. At the start of each sewer length, a data generator shall electronically generate and clearly display on the viewing monitor and subsequently on the final recording a record of data in alpha-numeric form containing the following minimum information:
 - 1. Automatic update of the camera's footage position in the sewer line from adjusted zero.
 - 2. Sewer dimensions in inches
 - 3. Manhole numbers (must conform to Owner's identification number)
 - 4. Date of survey
 - 5. Road name (nearest)/location
 - 6. Direction of survey, i.e., downstream or upstream
 - 7. Time of start of survey
 - 8. Material of construction of the pipe
 - 9. Contractor
 - 10. Engineer
- N. The size and position of the data display shall be such as not to interfere with the main subject of the picture.
- O. Once the survey of the pipeline is under way, the following minimum information shall be continually displayed:
 - 1. Automatic update of the camera's footage position in the sewer line from adjusted zero.
 - 2. Sewer dimensions in inches
 - 3. Manhole numbers (must conform to Owner's identification number)

4. Direction of survey, i.e., downstream or upstream
- P. At each defect of any kind, the camera movement shall be halted, and the camera shall be tilted and panned as necessary to observe the full extent of the defect before it is electronically coded.
- Q. At each coded observation, the following minimum information shall be displayed:
1. The PACP code and/or PACP code description.
 2. The footage position of the defect.
 3. The "Additional_Info" field in any cases where it is utilized.
- R. The actual field work will be monitored by the Engineer. A Project representative will be available during internal television inspection, and no work shall be performed without the Engineer's Project representative present, unless authorized by the Engineer.
- S. The contractor shall take caution to ensure that the pipe ID's and manhole ID's entered into the PACP database are correct, free from typos, and consistent with the data supplied by the Engineer. Databases with substantial rates of error in these fields will not be accepted.
- T. The Contractor must have an internal quality assurance/quality control system (QA/QC) in place, and all inspection data shall be subjected to the procedures prior to submittal to the Engineer. The Engineer will perform QA/QC audits on submitted data. Any data or files not meeting these specifications or NASSCO standards will be returned to the Contractor for correction. Contractor shall present their proposed QA/QC system to the Engineer prior to the start of the Contract.

3.4 CCTV Inspection Deliverables

- A. All the supplied data and information will become the property of the Owner.
- B. Sample Submittal: An example of a typical CCTV Inspection final deliverable will be submitted for approval by the Engineer prior to the start of work. The example deliverable will contain the following:
1. A sample NASSCO PACP Standard Exchange Database, version 6.0.2 or greater, in Microsoft Access file format (.mdb), as exported from the Contractor's data collection software.
 2. A proprietary database as generated by the Contractor's data collection software.
 3. Example media files, including observation photos, CCTV videos, and reports; with all files consistently utilizing the required file naming conventions and folder structures.
 4. The proposed viewing software to be used with the proprietary inspections database and related media.

5. NASSCO PACP validation report in PDF format, demonstrating the sample is fully conforming to NASSCO PACP standards and conventions. Validation reports can be obtained by submitting a sample database to:

http://www.nassco.org/training_edu/te_database_upload.aspx.
 6. Inspections database(s) shall be fully cross-referenced to the videos, images, and reports.
 7. Example reports will be presented in both hard copy and in PDF format, and all other sample data will be presented in digital format on an external hard drive.
- C. Intermediate Submittals: No later than every fourteen (14) days following the completion of a pipeline inspection, the Contractor will submit the following:
1. Two (2) hard copies of full details report for each inspection, showing the position and full text of each defect encountered and their grades.
 2. An overall summary report detailing major defects and inspections that require attention.
 3. A list of unmapped manholes and/or pipe segments that were identified during inspections but were not shown on field maps. This list shall include the field-assigned ID and a geographic reference or description (street address, intersection, etc.).
 4. A statistical report showing lengths of sewers inspected and a breakdown of sizes and lengths inspected.
 5. At regular agreed intervals, an external hard drive will be submitted to the Engineer containing a single NASSCO PACP Standard Exchange Database (version 6.0.2 or greater) containing all inspections to date, encoded videos, observation photos, inspection reports in PDF format, and support files. The supplied data and information will become the property of the Owner.
- D. Final Submittal: At the completion of all inspection work, the Contractor will supply the following to the Engineer on an external hard drive:
1. A single, consolidated NASSCO PACP Standard Exchange Database (version 6.0.2 or greater) in Microsoft Access file format (.mdb) containing all inspections.
 2. NASSCO PACP validation report for the consolidated database (See Section 3.04.B.5.).
 3. All encoded inspection videos, observation photos, and inspection reports using required file naming formats.
 4. A single, consolidated proprietary database containing all inspections for the Contract, as generated by the Contractor's data collection software.
 5. Free-issue software to be used for the viewing of the proprietary inspections

database and related media from within the database.

6. Four (4) hours training in the use of any supplied free-issue software will be included in the rates.

- E File Formatting and Naming Conventions: All submittals shall have the following file formatting and naming conventions, unless otherwise approved by the Engineer.

SUBMITTAL DESCRIPTION	FILE NAMING CONVENTION	FILE FORMAT
Digital encoded videos	"Upstream_MH"_"Downstream_MH"_"Direction"_"Date"_"Time"	.mpg
Digital still images of all observations	"InspectionID"_"ConditionID"_"Distance"_"PACP_Code" (multiple digital still images may have "-01", "-02", "-03" at end of file name)	.jpg or .jpeg
Color, Hi-res Laser profiling image of pipe 50' cross-sections	"InspectionID"_"ConditionID"_"Distance"_"PACP_Code"	.jpg or .jpeg
Pipe Segment Cleaning Report	CR-"Pipe_Segment_Reference"	.pdf
Pipe Segment Inspection Report	"Upstream_MH"_"Downstream_MH"_"Direction"_"Date"_"Time"	.pdf
NASSCO PACP Validation Report	"yyyymmdd(date of submittal)"_"Project Name"_"Validation Report"	.pdf
NASSCO PACP Exchange Database	"yyyymmdd(date of submittal)"_"Project Name"_"StandardPACPExchange"	.mdb

- F. External Hard Drive Requirements

External hard drives shall be a minimum of 500 Gigabytes (GB) in capacity, shall have a USB 2.0 compliant connection, and shall be powered either through the host USB connection or have an external power adapter provided. External hard drives will be returned within 5 business days to the Contractor for use on outstanding inspections after download by the Engineer. At the conclusion of the project, the final submittal external hard drive will become the property of the Owner for use in archival of data. The Contractor shall keep a copy of final submitted external hard drives for up to 3 years.

- G. NASSCO PACP Compliance

The submitted database(s) should consist of, at a minimum, the NASSCO PACP standard data fields, formats, and conventions as set forth in this specification and Attachment A – Field Data Delivery Format Requirements.

END OF SECTION

Sewer Replacement - Pipe Bursting Method

Part 1 General

1.01 Scope

- A. The work covered by this section shall consist of replacing existing sanitary sewer pipes by a pipe bursting method of trenchless pipeline replacement utilizing a pneumatic burster unit to split the existing host pipe while simultaneously installing a new approved material pipe of the same size or larger diameter where the previous pipe existed. Existing pipe is broken with a static burst machine and moved into the surrounding soil. The replacement pipe is either pulled or pushed by means of hydraulic force into place. The size hammer to be used shall be the minimum diameter necessary to facilitate the process. Oversized hammers shall not be allowed.
- B. No pipe bursting restoration will be accepted that has created a sag in the restored line by oversized hammers or other procedures. The Contractor shall be responsible for correcting existing sags (as defined in this Section, 3.01) and any sags that are created by the new construction.
- C. The work performed under this Section of the Specifications is deemed to be Specialty Contractor Work and is subject to the provisions of Section 00 72 00 General Conditions, Article 6.06, Paragraph (I).
- D. The deterioration of sewers is an on-going process. In the event pre-construction inspections reveal the sewers to be in substantially different conditions than those in the design requirements specified herein, the Contractor shall submit a changed site condition notice and request such changes in liner thickness, supporting such requests with the appropriate design data satisfactory to the Engineer.

1.02 Reference Standards

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. The latest revisions of all standards in effect on date of advertisement are applicable. Where differences exist, or any latitude is either inferred or interpreted between this Specification and referenced product/process standards, this Specification shall govern. Reference is also made to Section 33 30 00 Sewers and Accessories for complete technical requirements of approved pipe materials.

1.03 Quality Assurance

- A. Contractor/Installer Experience: The installing Contractor for the pipe burst shall have a minimum of five years experience using the specified method of installation as well as experience with the upsizing of existing sewer pipe. Documentation along with contact names and telephone numbers from the last ten projects shall be submitted with the Bid in accordance with the instructions to Bidders. Evidence of similar experience shall include at least two pipe burst projects that were a minimum of 24-inch diameter.

Sewer Replacement - Pipe Bursting Method

- B. Submit evidence that the superintendent for the pipe bursting work has been in responsible charge of at least two successfully completed pipe bursting projects of similar size within the past two years.
- C. Personnel directly involved with installing the new pipe shall have received training from a qualified representative of the pipe manufacturer in the proper methods for handling and installing the pipe and connections associated with pipe bursting.
- D. Only personnel certified as fusion technicians by a manufacturer of HDPE pipe shall perform HDPE pipe jointing. They shall be trained, certified, and experienced in the operation of butt-fusing equipment and the installation of electro-fusion fittings by a manufacturer of HDPE pipe.
- E. The Contractor shall certify in writing that he is a fully trained licensee of an approved pipe bursting system.
- F. Product manufacturers shall provide the Engineer with written certification that all products furnished comply with all applicable provisions of these Specifications.
- G. The 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.
- H. The equipment supplier shall furnish the services of a competent factory representative to observe and provide guidance to the Contractor on the setup of equipment and the bursting operation.

1.04 Submittals

- A. Complete product data and engineering data shall be submitted to the Engineer in accordance with the requirements of Section 01 33 23 of these Specifications.
- B. The Contractor shall submit a work plan to the Engineer for review and acceptance. The work plan shall address the following minimum preparation/steps, unless directed otherwise by the Engineer:
 - 1. Safety
 - 2. Pre-installation CCTV Inspection
 - 3. Bypass Pumping (refer to Section 01 51 43)
 - 4. Line Obstructions
 - 5. Sags In Line
 - 6. Description of bursting equipment
 - 7. Type of bursting tool and pulling unit

8. Equipment operating procedures
 9. Type of lubricant and MSDS
 10. Traffic Control Plan
 11. Flood Response Plan
 12. Equipment Recovery Plan
 13. Pit Excavation Plan
 14. Pit Support Plan
 15. Dewatering Plan (refer to Section 31 23 33)
 16. Copies of all the training certifications for the personnel fusing HDPE pipe and fittings working on the Project must be submitted to the Engineer prior to commencing work, including copies of any required technology licenses.
 17. HDPE pipe calculations to confirm the specified DR selection per the proposed pipe depth.
 18. Bending radius calculations for proposed pipe installation.
 19. Verify the pull load required for the project.
 20. Verify shoring will tolerate proposed pull load.
 21. Detailed step-by-step description from beginning to end of burst.
 22. Verify dimensions of machine pit and pipe launch pit.
- C. Submit the location and dimensions of the pits to be excavated. Submit proposed modifications to existing manholes, if any, if manholes are to be used as machine pits or pipe insertion pits.

1.05 Transportation and Handling

- A. Unloading: Furnish equipment and facilities for unloading, handling, distributing and storing pipe, fittings 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, 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.

1.06 Storage and Protection

Sewer Replacement - Pipe Bursting Method

- A. Store all pipe which cannot be distributed along the route. Make arrangements for the use of suitable storage areas.
- B. Stored materials shall be kept safe from damage. The interior of all pipe, 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. 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.

Part 2 Products

2.01 Pipe

A. Pull Method

1. High Density Polyethylene (HDPE) Pipe

a. Gravity or Force Main Applications

- i. Pipe and Fittings: The pipe shall be HDPE PE4710 and shall meet the requirements of AWWA C906. Pipe shall be in ductile iron pipe sizes (DIPS). The pressure rating shall be 126 psi with a maximum dimension ratio (DR) of 17. Laying lengths shall be 40-ft standard.
- ii. Pipe and fittings shall be marked as prescribed by AWWA C906. Pipe markings shall include nominal size, OD base (i.e., 12-inch ductile iron pipe sizing, DIPS), dimension ratio, pressure class, AWWA C906, manufacturer's name, production code and extrusion date.
- iii. HDPE gravity sewer shall also have a light interior color.
- iv. HDPE sewer force main pipe shall have a green colored stripe along the exterior length of the pipe.

2. Fusible Polyvinyl Chloride (FPVC) Pipe

a. Gravity Applications

- i. Fusible PVC pipe shall be permitted for only 4-inch through 16-inch diameter gravity sewer pipe.
- ii. Pipe 15-inch diameter or smaller shall conform to ASTM D 3034; pipe larger than 15-inch diameter shall conform to ASTM F 679.
- iii. Fusible polyvinylchloride pipe may instead conform to AWWA C900 or AWWA C905, if applicable. Testing shall be in accordance with

Sewer Replacement - Pipe Bursting Method

AWWA standards for any of these pipe types. If the AWWA standards are used, pipe diameters shall be in Ductile Iron Pipe Sizes (DIPS).

- iv. Rework material shall be allowed per ASTM D3034, ASTM F679, AWWA C900 or AWWA C905 standards.
 - v. All pipe shall have an SDR of 35 and a minimum pipe stiffness of 46 psi when tested in accordance with ASTM D 2412. Where pipe depth is greater than 20 ft., provide pipe in SDR 26 with minimum pipe stiffness of 115 psi.
- b. Force main applications
- i. Fusible PVC pipe shall be permitted for only 4" through 16" diameter sewer force main pipe.
 - ii. Fusible polyvinylchloride pipe shall conform to AWWA C900 or AWWA C905. Rework material shall be allowed per AWWA C900 and AWWA C905 standards.

B. Push Method

1. Ductile Iron Pipe (DIP) and Fittings

- a. Lined and polyethylene (PE)-wrapped DIP shall conform to AWWA C150 and C151. Nominal pipe laying lengths shall be 20 feet.
- b. Fittings shall be ductile iron conforming to the requirements of AWWA C153 or AWWA C110 and shall have a minimum pressure rating of 250 psi.

2. Fiberglass Reinforced Polymer (FRP) Pipe and Fittings

- a. Pipe shall be manufactured in accordance with ASTM D3262, with gaskets meeting ASTM F477, and interior surface resin in contact with wastewater meeting ASTM D3681.
- b. All FRP joints shall meet the performance requirements of ASTM D4161 with gaskets meeting ASTM F477.
- c. Stiffness class of FRP pipe shall satisfy design requirements but shall not be less than 46 psi.

- C. General: Pipe installed by the pipe bursting method shall be high density polyethylene (HDPE) pipe unless otherwise indicated on the Drawings. All pipe shall be made of virgin material. No rework except that obtained from the manufacturer's own production of the same formulation shall be used. The pipe shall be homogenous throughout and shall be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.

Sewer Replacement - Pipe Bursting Method

- D. HDPE Pipe: Wall thickness shall be minimum SDR 17 (DIPS) per ASTM F714. HDPE pipe shall be manufactured in accordance with ASTM F 714. Joints shall be of the butt-fusion type. Pipe shall be light or opaque in color to facilitate closed-circuit television inspection. Outer wall shall have a minimum of three equally spaced extruded green stripes designating use for sanitary sewer.
- E. Conventional fusion saddles as manufactured by Central Plastics, Phillips Driscopipe, Plexco or approved equal and shall be installed in accordance with the manufacturers recommended procedures.
- F. Pipe Joining: The polyethylene pipe shall be assembled and joined at the site using the butt-fusion method to provide a leak proof joint. Threaded or solvent-cement joints and connections are not permitted. All equipment and procedures used shall be used in strict compliance with the manufacturer's recommendations. Fusing shall be accomplished by personnel certified as fusion technicians by a manufacturer of polyethylene pipe and/or fusing equipment. The butt-fused joint shall be true alignment and shall have uniform roll-back 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 a tensile strength equal to that of the pipe. All joints shall be subject to acceptance by the Engineer prior to insertion. Terminal sections of pipe that are joined within the insertion pit shall be connected with Central Plastics Electrofusion Couplings or approved equal connectors with tensile strength equivalent to that of the pipe being joined.

2.02 Manholes

Manholes shall be as specified in Section 33 30 00 of these Specifications, and of a class equal to that shown on the Drawings.

2.03 Equipment

- A. Bursting/Towing Tool: The tool shall have an outside diameter greater than the outside diameter of the new pipe. Additionally, the outside diameter of the tool shall not be greater than the outside diameter of the new pipe plus 1-inch. The tool shall be capable of fragmenting the pipe and compressing the old pipe sections into the surrounding soil as it progresses. The bursting head shall incorporate a shield or expander to prevent collapse of the hole ahead of the polyethylene pipe insertion. 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 move forward.
- B. Only pneumatically operated equipment with either front or rear expanders for the proper connection to the polyethylene pipe will be allowed for use. The pneumatic tool must be used in conjunction with a constant tension/variable speed winch. The winch shall have twin cable pulling capstans with twin hydraulic drive motors and twin gear boxes for independent operation of 5, 10 or 20 tons. The size of the winch will be dependent on the diameter of the pipe to be replaced. In no case will the constant tension on the winch exceed 20 tons.

Part 3 Execution

3.01 General

- A. All construction activities shall be contained within the existing permanent and temporary easements as shown on the drawings.,. Trees shall not be disturbed, except as absolutely necessary for performing this work.
- B. The tool shall be pushed or pulled through the bore of the existing pipe such that the existing sewer pipe is broken into small fragments. The tool shall drive these fragments into the surrounding pipe zone.
- C. The tool shall produce a tunnel along the vertical and horizontal alignment of the existing sewer. The tool shall also construct the new sewer by pushing or pulling the new pipe into the tunnel.
- D. The new sewer shall be constructed straight and along the same horizontal and vertical centerline as the existing sewer.
- E. Flow in the existing sewer shall be pumped around during installation and testing of the new sewer per Section 33 30 00, Article 3.09. The Contractor is responsible for paying all fines imposed for overflows during construction.
- F. Where it is not practical to use a pump around line, upstream flow may be pumped into a suitable tanker(s) for storage, transportation and gradual release downstream of the section of pipe being burst. The Contractor shall obtain specific approval for this method of flow bypass prior to proceeding with the work at such location.
- G. HDPE Pipe: After the new sewer has been installed to its final position, the pipe shall be allowed to relax to relieve stresses prior to being trimmed at manholes. Service connections to the new sewer shall accommodate movement of the sewer which is experienced during the pipe relaxation process.
- H. Where upheaval of the existing ground surface occurs above the pipe bursting work, regrade the ground surface to provide the original ground elevations and surface conditions. Restore the disturbed area(s) to preconstruction conditions.
- I. Traffic Control: The Contractor shall be responsible for traffic control during the course of each phase of the Work. Prior to beginning Work, Contractor shall submit a traffic control plan for each section of Work for the review and approval. It is the intent that this Work is to be accomplished with as little disturbance to traffic, private property, and the public as is reasonably possible, consistent with timely completion thereof. The traffic control plan shall reflect such requirements where applicable. Signs, signals, and detours shall conform to the local and state requirements for streets and highways. The Contractor shall have and maintain on site a sufficient supply of traffic cones and other traffic signaling devices, including trained and properly equipped flagmen, to safely control all traffic through the work zone(s). Road closures and / or detours will require advance scheduling and prior approval by the Engineer.

Sewer Replacement - Pipe Bursting Method

- J. **Line Obstructions:** If Pre-Installation CCTV inspection reveals an obstruction in the existing sewer that was not evident in the Survey inspection (heavy solids, dropped joints, collapsed pipe, etc.), that will prevent completion of the pipe bursting process, and the obstruction cannot be removed by conventional sewer cleaning equipment, then an obstruction removal will be performed by the Contractor, with the approval of the Engineer.
- K. **Sags In Line:** If Pre-Installation CCTV inspection reveals a sag in the existing sewer that is equal to or greater than one-quarter of the diameter of the existing pipe, it shall be the Contractor's responsibility to install the replacement pipe to result in an acceptable grade without the sag. The Contractor shall take the necessary measures to eliminate these sags by the method of pipe replacement, digging a sag elimination pit and bringing the bottom of the pipe trench to a uniform grade in line with the existing pipe invert, or by other measures. If a sag elimination pit is required, the Contractor shall utilize it as the insertion pit for that segment of pipe replacement.

3.02 By-Pass Pumping

- A. The installation methodology contemplated requires the temporary blocking and back-ups of sewers and sewage. Contractor shall be responsible to limit the extent and duration of such blockages and back-ups so that overflows and spillage onto public or private property and into storm sewers, waterways, and streets does not occur. In the event that such spillage or overflows do occur during the course of or as a result of the Work, the Contractor performing the Work shall immediately eliminate the spillage or overflow and, as necessary, remove the blockage and eliminate the back-up. On elimination of the spillage or overflow, the Contractor is to clean up and disinfect the area. Work to stop or contain such events is to be deemed emergency in nature and sufficient justification for total mobilization of resources, the use of overtime or double time, and any other reasonable measures to assure correction of the problem without delay. Damages arising from blockages, back-ups, spillage, or overflows of sewage during the course of the Work or because of the Work shall be the sole responsibility of the Contractor.
- B. Sewage flow shall be pumped around segments during the installation and testing of pulled or pushed replacement pipe, the televising of sewers and lateral service reinstatement.
- C. Pumping equipment shall have the capacity to convey 100% of peak flows around the construction area. The flow shall be intercepted at the upstream end of the construction area and shall be pumped through temporary piping of adequate size. The flow shall be discharged into a manhole on the downstream side of the construction area, thus by-passing the sewer segment(s) under construction. The Contractor shall be required to contact all residential and commercial customers whose service lines connect to the sewer main being bypassed and inform them that they will be temporarily out of service. The Contractor shall also advise those customers against water usage until the mainline is back in service. After completing the necessary work on the main line to allow its reuse, the Contractor shall advise those customers that the sewer main is back in service. The Contractor shall maintain a high degree of professionalism, both in workmanship and

appearance, at all times. Should a condition arise that the Contractor cannot restore service within 12 hours of service interruption; the Contractor shall make provisions for pumping all flows within the service interruption area at no cost to the Owner.

- D. Open channels or trenches shall not be used to convey flow.
- E. A standby pump of the same capacity shall be required on site.
- F. The Contractor is responsible for paying all fines imposed for overflows or spills during construction.

3.03 Pits

- A. Construct insertion pits, service pits and hydraulic machine pits as required to accomplish the work. The size and quantity of pits shall be the minimum necessary to accomplish the work.
- B. Location: In the determination of pit locations, the Contractor shall give consideration of other uses of the excavations, such as for services access and manholes, wherever possible. Pits shall be contained within acquired construction easements or existing permanent sanitary sewer easements.
- C. Pits shall be centered over the existing sewer.
- D. Pits shall be sloped and/or shored as necessary to comply with all regulatory requirements.
- E. Pits shall be provided with proper erosion and sedimentation control measures.
- F. Pits shall be supported as needed with temporary bracing, shoring, etc. Pit Support Plan shall be designed and certified by a Professional Engineer registered in the State of Tennessee.
- G. Rescue Shaft/Pit: In the event an obstruction is encountered during the burst and the burst is halted, the Contractor will be required to excavate and free the obstruction and continue installation.
- H. Pits shall be supported with shoring. Shoring shall be removed as backfill of pit progresses.

3.04 Manhole Connections

- A. If the new sewer is to be constructed through an existing manhole with the manhole not being used as a machine or insertion pit, the manhole wall shall be modified at the existing pipe connections such that the manhole will not be damaged by the tool passing through the manhole. The manhole shall be restored to have a smooth grouted flow pattern through it, with watertight seals around the pipe connections.
- B. If an existing manhole is demolished, cracked or its structural integrity is otherwise degraded as a result of the pipe bursting work, the Contractor shall provide a new

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manhole in accordance with Section 33 30 00 of these Specifications, at no additional cost to the Owner.

- C. To seal the pipe at the manhole, provide a sanded manhole adapter. Grout the adapter in the manhole wall, filling all voids for the full thickness. Acceptable manufacturers include GPK Products, Inc. or Owner approved equal.
- D. When the replacement pipe passes through or terminates at an existing manhole, the channel and portion of the base shall be removed as the Contractor deems necessary for the bursting tool to be able to maintain a constant line and grade upstream and downstream of the manhole. The pipe within the existing manhole shall be neatly and completely saw cut off and not broken or sheared off, to protrude at least 4 inches from the manhole wall. If the new pipe passes through the manhole, the pipe's top half within the manhole shall be neatly cut off and not broken or sheared off, at least 4 inches from the manhole walls. The channel in the manhole shall be rebuilt with new concrete and mortar, shall be a smooth continuation of the pipe(s), and shall be merged with other lines or channels, if any. Channel cross section shall be U-shaped with a minimum height to the pipe's crown. The channel sides shall be built up with mortar/concrete to provide benches at a 1 in 12 pitch maximum towards the channel.
- E. All cutting and sealing for the new pipe at manhole connections shall provide watertight pipe and manhole trough seals.

3.05 Services

- A. All services shall be located and exposed before the replacement operation begins for any given length of pipe being pulled or pushed.
- B. All service laterals shall be completely disconnected and isolated from the existing sewer before the replacement operation begins for that particular segment of sewer.
- C. Flow shall be bypassed to prevent accumulation of flow in laterals.
- D. Service laterals shall not be reconnected to the new sewer until the segment of the new sewer downstream of the service is complete, tested and accepted.
- E. Saddles for reconnection of service laterals shall be compatible with the new sewer pipe material. Electrofusion saddles shall be installed in accordance with the HDPE pipe manufacturers recommended procedures.

3.06 Acceptance

- A. The leading section of the new pipeline shall be pulled or pushed into a pit for inspection after completion of the replacement operation for each pipeline segment. Each such section shall be clearly marked and, if requested by the Engineer, made available to the Engineer for inspection.
- B. Sewer segments shall be tested between manholes by the air test method. These tests shall be performed and the section of line accepted prior to connecting any services or the main line flow.

1. 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 4.0 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 0.5 psi drop does not occur within the test time, then the line has passed the test. If the pressure drops more than 0.5 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 is as follows:

Approximate Pipe I.D., Inches	T (Time Min/100) Feet
6	5.7
8	7.6
10	9.4
12	11.3
15	14.2
18	17.0
21	19.8
24	22.8

2. 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 \pm two percent, shall be provided by the Contractor. Testing equipment shall be equal to Cherne Air-Loc Testing Systems.
 3. The Contractor shall keep records of all tests made. Copy of such records will be given to the Engineer or the Owner. Such records shall show date, line number and stations, operator, and such other pertinent information as required by the Engineer.
 4. 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.
- C. Each sewer segment between manholes shall be accepted upon successful completion of the air leakage test.

Sewer Replacement - Pipe Bursting Method

- D. Post CCTV of Completed Pipe Sections: Post-installation videos shall be conducted and submitted to the Engineer in accordance with Section 33 01 30.16 of these Specifications.
- E. Smoke Testing of Service Lateral Connections: Once the pipe bursting operation is complete and services re-established, the Contractor shall perform a smoke test of the service laterals prior to backfilling. Leaks detected during testing must be repaired as part of the pipe bursting operation and shall be considered incidental and included in the cost of pipe bursting.

3.07 Customer Notifications

- A. The Contractor shall contact all residential and commercial customers whose service is to be interrupted by rehabilitation work or who may be affected by upstream or downstream rehabilitations. The customer shall be informed that they will be temporarily out of service. This notification shall be made a minimum of 24 hours prior to beginning rehabilitation work.
- B. For all residences the Contractor shall leave a door hanger detailing the service outage and providing contact information. Door hanger samples shall be submitted to the Engineer for review and approval. The Contractor shall also advise those customers against water usage until the mainline and lateral are back in service. After completing the necessary work on the main line and lateral to allow their reuse, the Contractor shall advise those customers that the sewer is back in service. Should a condition arise that the Contractor cannot restore service within 12 hours of service interruption; the Contractor shall make provisions for pumping all flows within the service interruption area at no cost to the Owner.

END OF SECTION

Subsurface Manhole Rehabilitation

Part 1 General

1.01 Scope

- A. The scope of this section of the Specifications includes requirements for furnishing all labor, material and equipment to provide for the reconstruction of existing manholes, manhole benches and inverts using an approved method of non-disruptive rehabilitation within an existing structure, which has generally maintained its original shape.
- B. The work performed under this section of the Specifications is deemed to be Specialty Subcontractor Work and is subject to the provisions of Section 00 72 00, Article General Conditions, Article 6.06, Paragraph (I).
- C. 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 existing on advertisement date of all standards are applicable. Where discrepancies exist between this Specification and referenced product/process standards, this Specification shall govern.

1.02 Specialty Subcontractor and Qualifying Superintendent Experience

- A. The Specialty Subcontractor performing the work shall be fully qualified, experienced and equipped to complete this work expeditiously and in a satisfactory manner. The Specialty Subcontractor shall be an approved installer as certified and licensed by the manufacturer. The Contractor must certify that the proposed product/process to be used is the exact system for which any and all submittals and certifications were made. No substitutions will be allowed, and misrepresentations or omissions may be grounds for Contract termination with the Contractor waiving any and all claims against the Owner for work performed or costs incurred.
- B. The proposed qualifying superintendent of the Specialty Subcontractor for the work under this Section shall have successfully installed a manhole lining product of the type specified in a minimum of 500 manholes/structures over the last ten years as documented by verifiable Owner references. The Owner must approve both the Specialty Subcontractor and the Qualifying Superintendent to perform this work. The approved superintendent shall be on-site during the execution of all lining operations including prep work and vacuum testing. The lining installation and/or vacuum testing shall cease whenever the superintendent is not on-site.

1.03 Storage, Handling and Protection

Care shall be taken in shipping, handling and storage to avoid damaging the lining materials. Any lining product damaged in shipment, showing deterioration, or which has been exposed to any other adverse storage condition that may have caused

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damage, even though no such damage is evident, shall be marked as rejected and removed at once from the job site. While stored, the lining products shall be adequately packaged, protected and stored in accordance with the manufacturer's recommendations.

1.04 Submittals

- A. The Contractor shall submit for all products to be installed under this section of the Specifications the following:
1. Description, layout, and application sequencing plan.
 2. Rehabilitation system application requirements including material handling and storage requirements, mixing and proportioning requirements (as applicable), maximum pot life, film/coating thickness, curing, testing and certification requirements of all rehabilitation materials. Product Material Safety Data Sheets (MSDS).
 3. Detailed instructions and methodology for finishing all pipe and manhole connections to rehabilitated manholes to prevent infiltration and exfiltration.
 4. Wastewater Flow Control/Bypassing Plan.
 5. Confined Space Entry Plan/Permit.
 6. Plan for capturing extraneous debris during rehabilitation processes and debris disposal.
 7. Liner and vacuum test results.
- B. The Contractor shall submit evidence of meeting the requirements of meeting the requirements of Article 1.02 above.
- C. The Contractor shall provide bond strength data on the cured cementitious lining based on ASTM test methods referenced in this Specification.
- D. The Contractor shall provide test data on shrinkage of the cured cementitious lining based on ASTM test methods referenced in this Specification.
- E. The Contractor shall submit complete shop drawings of the manhole lining system(s) to demonstrate compliance with these Specifications, materials and detailed installation procedures. Testing procedures and quality control procedures shall also be submitted. Certifications that the lining system was manufactured in accordance with these Specifications and the applicable ASTM standards shall be submitted with each material shipment.

1.05 Warranty

The coatings/linings manufacturer shall warranty the entire project to include any

and all aspects of the surface preparation, base material installation and protective coating/lining applications for a period of ten (10) years from the date of acceptance by the Owner. The warranty shall make no distinction between installation practices and material performance and shall not be prorated with respect to elapsed time for the entire warranty period. Manufacturer shall, within a reasonable period of time after receipt of written notice thereof by the Owner period not to exceed sixty (60) calendar days, repair defects in materials or workmanship during said ten (10) year period, and any damage to other work caused by such defects or repairing of same at his own expense and without cost to the Owner.

Part 2 Products

General

The rehabilitation of manholes is divided into two product classes: cementitious products and polymer resin-based products.

Where specified, cementitious products will be used when there is little or no evidence of sewer gas deterioration. Polymer resin-based products shall be specified where the presence of sewer gas deterioration and attack is evident or anticipated.

2.01 Cementitious Lining

- A. The cementitious lining system shall be pumpable Portland-based cement or fused calcium aluminate cement. The lining shall be applied via low-pressure spray or trowel application only. The materials shall be suitable for all specified design conditions. The final product shall not deteriorate, corrode, or lose structural strength in any manner. 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 the requirements of ASTM C 144.
- B. The cementitious lining shall be installed on manhole benches, inverts and walls unless otherwise directed by the Engineer.
- C. The materials used in the cementitious lining systems shall be mixed on-site according to the manufacturer's recommendations. Water shall be added to the materials only during the mixing process and prior to material pumping or spray application. No water shall be added at the nozzle.
- D. The cementitious liner, when cured, shall have the following minimum characteristics at 28 days as measured by the applicable ASTM standards referenced in this Specification:
 1. Minimum compressive strength of 6,000 psi.
 2. Minimum tensile strength of 600 psi

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3. Minimum flexural strength of 1,000 psi
 4. Minimum bond strength of 200 psi.
 5. Shrinkage of less than 0.05%
- E. The cured cementitious lining shall be continuously bonded to all brick, mortar, concrete, chemical sealant, grout, pipe and other substrates inside the manhole.
- F. Patching Material: A quick setting fiber reinforced cementitious material shall be used as a patching material and is to be mixed and applied according to manufacturer's recommendations.
- G. Hydraulic Cement: A rapid setting, high-early-strength, cementitious product specifically formulated for leak control shall be used to stop water infiltration. The material shall be mixed and applied according to the manufacturer's recommendations.
- H. Chemical sealants or grouts used to seal active manhole leaks, patch holes or cracks, fill voids and to otherwise prepare the manhole surface for lining shall be suitable for wastewater system service and chemically resistant to any chemicals or vapors normally associated with domestic wastewater installations.
- I. Cementitious linings shall be compatible with existing thermal conditions in the manhole.
- J. Cementitious products shall be applied with a one inch finished thickness and shall be one of the following products:
1. Strong Seal MS-2A, as manufactured by Strong Seal Systems
 2. QM-1s Restore or Alumaliner as manufactured by Quadex
 3. Permacast MS-10,000 or CR-5000 as manufactured by APM, Inc.
 4. Sewpercoat PG as manufactured by Kerneos, Inc., Chesapeake, Virginia
 5. Mainstay ML-72 Restoration Mortar as manufactured by Madewell Products Corp.
 6. Substrate Surfacer No. F-121FBR as manufactured by Sauereisen
 7. MSM as manufactured by AW Cook
 8. Reliner MSP as manufactured by Standard Cement Products

2.02 Polymer Resin-Based Linings

- A. Type 1 Polymer resin-based liners shall be 100% solids by volume, volatile organic compound (VOC) free and shall conform to the minimum physical properties listed in the following table:

Compressive Strength	ASTM D695	10,500 psi
Tensile Strength	ASTM D638	7,000 psi
Flexural Strength	ASTM D790	12,000 psi
Flexural Modulus (Initial)	ASTM D790	730,000 psi
Density		87 ± pcf
Bond		Exceed tensile strength of substrate

- B. The structures lined with polymer resin-based liners shall be resistant to corrosion caused by:
1. Hydrogen Sulfide
 2. 20% Sulfuric Acid
 3. 17% Nitric Acid
 4. 5% Sodium Hydroxide
 5. All common ingredients normally associated with sanitary sewer environments and an environment of pH of 0.5 or higher.
- C. The finished liner shall have long-term (50-year) flexural modulus of elasticity value of 500,000 psi and shall be certified by independent third-party testing.
- D. Polymer resin-based linings shall be compatible with existing thermal conditions in the manhole.
- E. The final product shall not deteriorate, corrode, or lose structural strength in any manner.
- F. The system shall be designed to operate at ambient temperatures up to 140 degrees F with excellent abrasion resistance.
- G. The Type 1 Polymer resin-based lining system shall be a resin-based lining system applied with a minimum 250 mil (1/4-inch) finished thickness meeting the requirements of paragraph 2.02 above and shall be one of the following products:
1. Spraywall or Sprayshield as manufactured by Sprayroq, Inc.
 2. S-301 Epoxy Spray System as manufactured by Warren Environmental, Inc.
 3. Dinjer SG Mastic as manufactured by Pilgrim Permocoat Inc.
 4. Raven 405 as manufactured by Raven Lining Systems

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5. SLS-60™ by Citadel Technologies
 6. Cor+Gard FC as manufactured by APM Permaform
- H. The Type 2 Polymer resin-based lining system shall be a multi-layer lining system in accordance with the following requirements:
1. Lining system shall be Spectrashield as manufactured by CCI Spectrum, Inc.
 2. The liner system shall be a multi-component stress skin panel liner system as described below:

<u>Layer</u>	<u>Material</u>	<u>Minimum Thickness</u>
Moisture Barrier	Modified Polymer	100 mils
Surfacer	Polyurethane/Polymeric blend foam	500 mils
Corrosion barrier	Modified Polymer	150 mils
Total Installation		750 mils

3. The modified polymer shall be sprayable, solvent free, two-component polymeric, moisture/chemical barrier specifically developed for the wastewater environment with the following physical properties:

<u>Parameter</u>	<u>Method</u>	<u>Value</u>
Tensile Strength, psi	ASTM D412	>2,400
Elongation, %	ASTM D412	>300
Tear Strength, PSI	ASTM D624	>500
Shore A Hardness	ASTM D2240	>96
Flexural Modulus	ASTM D522	>2,400

4. The polyurethane/polymeric blend foam shall be a rigid structure foam, low viscosity two-component blend with the following physical properties:

<u>Parameter</u>	<u>Method</u>	<u>Value</u>
Density, lbs/ft ³	ASTM D1622	4-10
Compression Strength, psi	ASTM D1621	90-150
Closed Cell Content, %		>95
Shear Strength, psi	ASTM C273	225-250

Part 3 Execution

3.01 General

- A. The Contractor shall notify all property owners who discharge sewage directly into the manhole being rehabilitated at least 48 hours in advance, giving the date, starting and estimated completion time for the work being conducted and any anticipated impact to the property owner. Notification shall consist of a door hanger and/or letter. A sample of the proposed door hanger or letter shall be submitted to the Engineer for review and approval.
- B. The Contractor shall bypass pump sewage flows around the manhole being rehabilitated while the work is being performed complying with Section [01 51 43] of these Specifications. A detailed bypass plan shall be submitted to the Engineer for approval before any work shall take place.
- C. Covers or plugs shall be placed over all pipe openings to prevent excess material from entering the wastewater collection system.
- D. Manhole walls and benches shall be monolithically coated to the required thickness by spray-on methods in a single pass or application. Sprayed cementitious linings shall be trowelled smooth after application.
- E. All invert channels shall be coated with grout or cementitious mortar to build up the invert to the invert elevations of new liner pipes (if applicable and as directed by the Engineer); to fill all cracks, voids, holes, etc.; and to form a smooth flow channel. The entire channel shall be coated with the channel coating being a minimum ¼-inch thick.
- F. A complete watertight seal shall be provided at the pipe and manhole wall connections. The Contractor shall submit details of how watertight connections shall be made to the Engineer for approval prior to performing any work.
- G. Manhole lining shall not be installed until all required mainline sewer rehabilitation and/or other manhole work is completed.
- H. Application of the spray applied material must be completed in one mobilization in order to minimize the disruption and cost of bypass pumping, pipeline plugging, traffic control and other ancillary services.
- I. The finished manhole may be returned to service immediately upon completion of the spray application.
- J. Appropriate personal protection equipment shall be used with supplied air being utilized to the spray technician and other personnel in direct contact with the spray environment.

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- K. The spray shall be applied so that the entire structure receives a structurally sound, monolithic liner. The finished invert surfaces shall be smooth, free of ridges and bumps and will be sloped in the direction of flow. Special care shall be taken to ensure a smooth transition between the new manhole invert and intersecting pipeline inverts so that flow will not be impaired.
- L. The cured surfacing thickness shall be smooth, even (without ridges or bumps) and continuous with proper sealing connections to any non-rehabilitated areas.
- M. The monolithic lining shall completely cover the interior of the existing manhole including the benches and invert unless otherwise directed by the Engineer. The lining shall effectively seal the interior surfaces of the manhole and prevent any penetration or leakage of ground water infiltration.
- N. The Contractor shall adhere to all of the lining manufacturer's installation requirements including environmental conditions (ambient temperature, moisture, etc.) and curing times.

3.02 Surface Preparation (All Lining Systems)

- A. The Contractor shall clean each sewer manhole to be restored and shall dispose of any debris or resulting material in a manner and place suitable to the Owner. Cleaning shall be performed using a high-pressure jet wash at a minimum of 3,500 psi water pressure to remove all dust, biological growths, grease, oils or any other surface contaminants or coatings.
- B. The Contractor shall immediately notify the Engineer of any coatings that cannot be removed or substrates which cannot be cleaned and, upon the approval of the Engineer, may use a blast abrasive in these area(s) to rough up the surface sufficient to obtain and ensure adequate bonding of the liner. Roots shall be removed by manually cutting them from inside the manhole.
- C. The Contractor shall conduct a visual inspection of each manhole after it is cleaned. All active leaks shall be plugged or sealed with an appropriate grout compatible with the lining. Injection grouting may be required to seal active leaks including existing leaks in invert channels and benches. All loose mortar and rubble of existing benches, walls and inverts shall be removed.
- D. The Contractor shall prepare the manhole to receive lining as necessary by reshaping and repairing benches, inverts and walls where required including smoothing out irregular shaped corbel and chimney sections prior to any spray application. All interior surfaces shall be prepared as recommended by the lining system manufacturer. Minimum requirements of the Specification are as follows:
 - 1. All cracks and voids must be repaired and filled with suitable non-shrinking cements, sealants or grouts, including all voids between existing sewer pipes and manhole walls. All patch repairs shall be smooth and even with the manhole wall.

2. All voids around existing manhole rungs, steps and anchors shall be filled.
 3. All surfaces shall be suitably prepared for the required bonding of the liner as recommended by the manufacturer and acceptable to the Engineer.
- E. Prior to lining, the Engineer shall inspect and approve the surface preparation work. The Contractor shall notify the Engineer when the manholes are ready for inspection. The Contractor shall take digital photographs of the invert, bench and pipe openings and present them to the Engineer in order to document the readiness of the manhole for lining application in these areas. The manhole lining shall be performed immediately after the Engineer's inspection or the manhole may need to be re-cleaned and dried prior to lining application to remove accumulated debris on walls and benches.

3.03 Additional Requirements for Polymer Resin-Based Lining Systems

- A. Application of the liner shall not be made unless the ambient temperature inside the structure is 50 degrees F or higher and expected to be the same or rise during the next 72 hours.
- B. The liner shall be manually sprayed to all surfaces by a factory-certified, trained technician experienced in the application of a spray applied resin.
- C. No other products such as grouts, cements or sealants may be considered as part of the structural restoration. However, said products may be used as part of the repair and surface preparation process as specified in Section 3.02 of this Specification.
- D. The wall of the Polymer resin-based system shall be structurally designed to withstand the hydraulic load generated by the groundwater table.

3.04 Acceptance Testing

- A. Field Acceptance
 1. Field acceptance of manhole lining shall be based on the Engineer's field inspection and evaluation of the appropriate installation and curing test data. The lining shall provide a continuous monolithic surfacing with uniform thickness throughout the manhole interior. If the thickness is not uniform or is less than specified, it shall be repaired or replaced at no additional cost to the Owner.
 2. If the Engineer has to enter the manhole to inspect the work, the Contractor shall provide forced air ventilation, gas monitors, harnesses, lights, confined space entry, etc., for the Engineer to enter the manhole and perform the inspection in strict and complete accordance with OSHA requirements at no additional cost to the Owner.
- B. Cementitious Test Samples

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1. Samples shall be taken of the installed liner each day that the cementitious lining is installed in the following manner:

Quantity of Manholes Lined in One Day	Quantity of Samples Required
1 – 5	1
6 – 10	2
11 – 15	3
16 or more	4

2. Samples shall be taken at equally spaced intervals throughout the workday. The frequency of tests may be increased by the Engineer and performed by the Contractor at no additional cost to the Owner when the required tests indicate that the installed lining does not meet the Specification.
- C. Cementitious Lining Strength and Bonding Testing Procedures: Samples shall be cube samples. A minimum of six cubes shall be taken for each sample testing. The samples shall be tested in accordance with the applicable ASTM standards, including ASTM C109, to verify that the installed liner meets the compressive strength requirements specified herein and the lining manufacturer's published product data. Tests shall include 7-day and 28-day strength tests (3 cubes for each time period per sample). Shrinkage and bond strength tests shall be performed on each batch or lot of material shipped to the Contractor. Testing shall be performed by an independent laboratory as determined by the Owner with all associated costs paid by the Contractor. The test results shall be submitted to the Engineer immediately when available and no later than 30 days after lining installation.
- D. Vacuum Testing (Cementitious Lining Manholes)
1. All manholes rehabilitated with cementitious products shall be vacuum tested when all manhole rehabilitation is completed. Manholes shall not be tested until at least 7 days after installation of lining.
 2. Vacuum testing shall be performed in accordance with ASTM C1244 with all associated costs paid for by the Contractor and included in the bid price for manhole lining.
 3. The Engineer shall be present for all testing. The Contractor shall notify the Engineer 48 hours prior to testing.
 4. The Contractor shall submit test reports of the testing which include: the Project name, manhole tested, testing data (vacuum pressure, duration of test, etc.), and whether the manhole passed or failed the test. Test reports must be submitted citing the reason for failure noted on the report.
 5. Any manhole failing the test shall be repaired and retested immediately by the Contractor at no additional cost to the Owner.
- E. Spark Arrestor (Holiday) Testing (Polymer Resin-Based Lining Manholes)

1. All polymer resin-based manhole linings shall be spark tested prior to being placed in service. Spark testing shall be required of the entire surface area of the manhole (field and joint) and shall be conducted in accordance with the liner system manufacturer's recommendations.
2. Results of the spark tests will be logged in duplicate and a copy of this log submitted to the Engineer.
3. Equipment systems used to perform spark testing shall be compatible with the materials to be tested. Spark testing equipment shall provide a visual as well as audible indicator to identify pinholes or splits in the liner system.
4. Spark testing shall be performed in accordance with ASTM D4787. Contractor shall maintain calibration records certifying the spark testing equipment has been calibrated within 12 months of the current date.
5. For polymer resin-based manhole lining products meeting the requirements of Article 2.05, Paragraph C, spark testing shall be performed on the complete three layer lining system.

F. Adhesion Testing (Polymer Resin-Based Lining Manholes)

1. The adhesion tests shall be performed on a minimum of one or 20% of all polymer resin-based rehabilitated structures, whichever is greater.
2. Adhesion testing shall be conducted after the lining or coating system has cured per manufacturer instruction and in accordance with ASTM D4541 (Steel) or ASTM 7234 (Concrete). A minimum of one 20 mm dolly shall be affixed to the lined surface of the structure at the upper section or cone area, mid section and at the bottom, unless otherwise specified or directed by the Engineer. Each testing location shall be identified by the Engineer.
3. Selection of the adhesive used to attach the dollies to the liner shall be the Contractor's responsibility. Adhesive shall be rapid setting with tensile strength in excess of the liner material, suitable for the environmental conditions anticipated in a sanitary sewer manhole, and permitted to cure in accordance with manufacturer recommendations. The lining material and dollies shall be adequately prepared to receive the adhesive.
4. Prior to pull test, the Contractor shall utilize a scoring device to cut through the coating until the substrate is reached. Extreme care shall be required while scoring to prevent micro cracking in the coating, since cracks may cause failures at diminished strengths.
5. Failure due to improper dolly adhesive or scoring shall require retesting. The pull tests in each area shall meet or exceed 200 psi and shall include subbase adhered to the back of the dolly or no visual signs of coating material in the test hole.

Subsurface Manhole Rehabilitation

6. Pull tests with results between a minimum 150 psi and 200 psi shall be acceptable if more than 50% of the subsurface is adhered to the back of the dolly. A test result can be discarded, as determined by the Engineer, if there is a valid non-statistical reason for discarding the test results as directed by Sections 8.4 and 8.5 of ASTM D4541 and ASTM D7234.
7. If any test fails, a minimum of three additional locations in the section of the failure shall be tested, as directed by the Engineer. If any of the retests fail, the structure shall be deemed to have failed. All loosely adhered or unadhered liner in the failed area, as determined by the Engineer, shall be removed and replaced at the Contractor's expense.
8. The mil thickness will be measured and confirmed with the scored and pulled test samples. If the measured thickness of any adhesion test samples is under the specified value, a minimum of three additional locations in the same structure shall be tested, as directed by the Engineer. All areas found to be less than the specified thickness shall be corrected through additional application of lining material.
9. If a structure fails the adhesion test based on adhesion value or mill thickness, one additional structure or 10% of the initial number of structures selected for testing, whichever is greater shall be tested at the discretion of the Engineer.
10. The liner shall be repaired at all pull test locations following testing.
11. The Engineer shall be present for all adhesion testing.
12. Adhesion testing shall be performed as the work progresses. If adhesion testing has not been performed on a minimum of 20% manholes lined to date at any given time, Engineer may prohibit the continued application of manhole lining until the required adhesion testing is completed.
13. For Type 2 polymer resin-based lining systems described in Article 2.05 Paragraph C, adhesion testing shall be performed on the complete three layer lining. For the purpose of thickness verification, additional core samples shall be taken from the outer corrosion barrier layer for every base layer adhesion test performed.

G. Finished Lining Systems

1. There shall be no groundwater infiltration or other leakage (active or previously active) through the manhole walls, benches, inverts or pipe connections at the manhole after it has been lined.
2. If leakage is detected, it shall be eliminated with an appropriate, grout or sealant as recommended by the manufacturer, over coated with epoxy or approved polymer-based lining material and approved by the Engineer at no additional cost to the Owner. Injection grouting may be required to stop leaks around or in invert channels, pipe connections and benches.

3. The Engineer's decision regarding acceptable repair methods for defective linings shall be final. If any lining is found to be defective after it has been installed or during the warranty period, it shall be repaired or replaced in a manner satisfactory to the Engineer and at no additional cost to the Owner.

END OF SECTION

Part 1 General

1.1 Scope of Work

The work covered by this Section includes furnishing all labor, equipment and materials required to install cast-in-place, and/or precast concrete manholes, and concrete junction chambers as described herein and/or shown on the Drawings.

1.2 Design Criteria

- A. Manholes shall be constructed of specified materials to the sizes, shapes, and dimensions and at the locations shown on the Drawings or as otherwise directed by the Engineer. The height or depth of the manhole will vary with the location, but unless shown otherwise on the Drawings shall be such that the top of the manhole frame will be at the finished grade of the pavement or ground surface and the invert will be at the designed elevations.
- B. Where the difference in the invert elevation of a sewer 18 inches in diameter or smaller and any other sewer intersecting in one manhole is 18 inches or more, a dropmanhole shall be constructed as shown on the Drawings. They shall be similar in construction to the standard manhole except that a drop connection of pipe and fittings of the proper size and material shall be constructed outside the manhole and be supported by Class B Concrete.

1.3 Quality Assurance

- A. Prior to delivery all basic materials specified herein shall be tested and inspected by an approved independent commercial testing laboratory or, if approved by the Engineer, certified copies of test reports prepared by the manufacturer's testing laboratory will be acceptable. All materials which fail to conform to these specifications shall be rejected.
- B. After delivery to the site, any materials which have been damaged in transit or are otherwise unsuitable for use in the work shall be rejected and removed from the site.

1.4 Shop Drawings and Engineering Data

Complete shop drawings and engineering data on frames, covers, and precast manhole sections shall be submitted to the Engineer in accordance with the requirements of the section entitled "Submittals" of these Specifications.

1.5 Guarantee

Provide a guarantee against defective materials and workmanship in accordance with the requirements of the Section entitled "Warranties and Bonds" of these Specifications.

Part 2 Products

2.1 Concrete and Reinforcement

- A. Concrete used in manhole and junction chamber construction shall be Class A concrete conforming to the requirements of the Section 03 30 00 Cast-In-Place Concrete of these Specifications.
- B. Steel reinforcement shall conform to the requirements of the Section entitled "Cast-In-Place Concrete Reinforcement" of these Specifications.

2.2 Mortar

- A. Mortar for manhole construction shall be sand cement mortar composed of one part Portland Cement to two parts clean sand conforming to ASTM C 144. Twenty pounds of hydrated lime per sack of cement may be added. No retempered mortar shall be used.
- B. Non-shrink mortar shall be pre-mixed, Master Builders "Masterflow 713", Sonneborn "Ferrolith G-D.S. Redi-Mixed", or equal.

2.3 Precast Concrete Manholes

- A. Precast concrete manholes shall consist of precast reinforced concrete sections, a conical or flat slab top section, and a base section conforming with the typical manhole details as shown on the Drawings.
- B. Precast manhole sections shall be manufactured, tested, and marked in accordance with the latest provision of ASTM C478.
- C. The minimum compressive strength of the concrete for all sections shall be 4,000psi.
- D. The maximum allowable absorption of the concrete shall not exceed eight (8%) percent of the dry weight.
- E. The circumferential reinforcement in the riser sections, conical top sections, and base wall sections shall consist of one line of steel and shall be not less than 0.12 square inches per lineal foot.
- F. The ends of each reinforced concrete manhole riser section and the bottom end of the manhole top section shall be so formed that when the manhole risers and the top are assembled, they will make a continuous and uniform manhole.
- G. Joints of the manhole sections shall be tongue and groove. Sections shall be joined using either an O-ring gasket or a butyl mastic sealant. The sealant shall be applied in accordance with the manhole manufacturer's requirements. A sufficient amount of sealant should be used to fill the annular joint space with some squeeze out.
- H. 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.

- I. Manholes shall be constructed without steps.
- J. Provide manhole waterproofing admixture of XYPEX C1000 or approved equivalent at 3% during the batching operation. A pink dye shall be included in each precast component to indicate and verify XYPEX C1000 admixture was added during batching operation. Manhole manufacturer to provide certification letter in the manhole submittal confirming the addition of this admixture. Manufacturer shall provide other documentation, as requested by the Engineer and to the satisfaction of the engineer, as verification of inclusion of this admixture to the precast structures provided for this project.

2.4 Frames and Covers

- A. Cast iron frames, and covers shall be cast iron conforming to the minimum requirements of Federal Specifications WW-1-652 or to ASTM A 48, "Gray Iron Castings," for Class 35B. All castings shall be made accurately to the required dimensions, fully interchangeable, sound, smooth, clean, and free from blisters and/or other defects.

Defective castings which have been plugged or otherwise treated shall not be used. All castings shall be thoroughly cleaned and painted or coated with a bituminous paint.

- B. All manhole frames and covers shall be of the size and weight shown on the Drawings. All regular manhole frames and covers shall be the City's Standard as manufactured by Acheson Foundry A2024-81C weight of 350 pounds as shown on the drawings.
- C. Watertight manhole covers shall be furnished with a rubber gasket, stainless steel tightening bolt, machined bearing surfaces, channel iron locking bar, and concealed watertight pick hole, and shall weigh not less than 590 pounds, and shall be of the size and dimensions shown on the Drawings. Watertight manhole covers shall be equivalent to A2624-71C as manufactured by Acheson Foundry of Chattanooga, Tennessee.
- D. The contact surfaces of all manhole covers and the corresponding supporting rings in the frames shall be machined to provide full perimeter contact.
- E. All sanitary sewer manhole covers shall have the words "CITY OF CHATTANOOGA" and "SEWER" as designated by the Engineer cast on the top in letters two (2) inches high or other as directed.
- F. An adjusting ring equal to R1979 as manufactured by Neenah Foundry Company of Neenah, Wisconsin, shall be provided for each manhole in a street. Adjusting rings shall provide a minimum inside clear opening of 24 inches and shall be made to be capable of being bolted to the manhole frame.

Part 3 Execution

3.1 General Manhole Construction

- A. All manhole bases, including curved manhole bases, and inverts shall be constructed of Class A concrete in accordance with details on the Drawings and inverts shall be smooth and accurately shaped and have the same cross section as the invert of the sewers which they connect.

The manhole base and invert shall be carefully formed to the required size and grade by gradual and even changes in sections, care being exercised to form the incoming and outgoing sewer pipes into the wall of the manhole at the required elevations. Changes in direction of flow through the sewer shall be made to a true curve with as large a radius as the size of the manhole will permit.

- B. Pipe of all diameters shall be connected to manholes using an integrally cast A-lock elastomeric ring, a Kor-N-Seal rubber boot, or approved equal flexible connector and shall be installed as recommended by the manufacturer. Connections using mortar or other rigid materials will not be acceptable. Connections to existing manholes shall be cored. "Hammer taps" will not be acceptable.
- C. Manholes shall be constructed without steps.
- D. Any adjustment necessary for manhole frame elevation shall be made with concrete "donut" sections. A maximum of three (3) sections shall be permitted.
- E. The cast iron frame for the manhole cover shall be set at the required elevation and properly anchored to the masonry. Where manholes are constructed in paved areas, the top surface of the frame and cover shall be tilted to conform to the exact slope, crown, and grade of the existing adjacent pavement.
- F. Masonry work shall be allowed to set for a period of not less than 24 hours. Outside forms, if any, shall then be removed and the manhole backfilled and compacted in the manner provided in the Section entitled "Earthwork" of these Specifications. All loose or waste material shall be removed from the interior of the manhole. The manhole cover then shall be placed and the surface in the vicinity of the work cleaned off and left in a neat and orderly condition.
- G. After backfilling has been completed, the excavated area if located in a street, alley, or sidewalk, shall be provided with a temporary surface, as directed by the Engineer.

3.2 Construction of Cast-In-Place Concrete Manholes

- A. Cast-in-place manholes, excluding curved manhole bases, shall be constructed in place with the base, barrel and conical section all monolithically cast using removable forms of a material and design approved by the Engineer
- B. The vertical forms, vertical and horizontal wall spacers and cone must be carefully positioned and firmly clamped in place before any placement is made. The wall spacers must be located 90 degrees from each other. The forms shall be firmly supported with bottom of forms at the proper elevation to permit the base to be deposited through the vertical forms.

- C. The manhole base shall be deposited down through the wall forms onto undisturbed earth or rock bearing. It shall be evenly distributed around the wall and vibrated both inside and outside the forms until there is a minimum slope of 60 degrees from the bottom of the forms to the bearing surface both inside and outside of the manhole. When this is complete and before additional concrete is added, the concrete must be carefully vibrated on each side of each sewer pipe.
- D. The base shall be concentric with the manhole and have a minimum diameter of 16 inches greater than the outside diameter of the manhole, and 10-inch minimum thickness under the lowest pipe. Minimum wall thickness shall be six (6) inches.
- E. Additional concrete must be deposited in evenly distributed layers of approximately 18 inches with each layer vibrated to bond it to the preceding layer. The wall spacers must be raised as the placements are made. The concrete in the area from which the spacer is withdrawn shall be carefully vibrated. Excessive vibration shall be avoided.
- F. Adjustment rings shall be provided between the conical section and the manhole frame. The rings shall be cast-in-place using building felt between pours to create a weakened joint or as directed by the Engineer. If adjustment of the lid elevation is called for, concrete "donut" sections shall be used.
- G. The invert and flow channel shall be constructed in accordance with the applicable requirements of Part 3.01 of this Section and shall be formed during or immediately after the placing of the concrete and brush-finished as soon as the concrete has sufficiently set.
- H. Form marks and offsets shall not exceed one (1) inch on the outside surface of the manhole. Form marks and offsets shall not exceed 1/2 inch inside of the manhole. All offsets on the inside surface of the manhole shall be smoothed and rubbed so there is no projection or irregularity capable of scratching a worker or catching and holding water or solid materials. Honeycombed areas shall be completely removed immediately upon removal of the forms and replaced with Class A concrete.
- I. Should circumstances make a cold joint necessary, a formed groove or reinforcing dowels shall be required in the top of the first placement for shear protection. Immediately before the second placement is made, the surface of the cold joint shall be thoroughly cleaned and wetted with a layer of mortar being deposited on the surface.
- J. Concrete setting time, backfilling, masonry work, setting frame and cover, temporary paving, etc., shall be in accordance with the applicable requirement of Part 3.01 of this Section.

3.3 Construction of Precast Concrete Manholes

- A. The base and invert shall be constructed in accordance with the applicable requirements of Part 3.01 of this Section.
- B. After the base section has been allowed to set for a period of not less than 24 hours, the precast manhole sections shall be placed thereon, care being exercised to form the incoming and outgoing sewer pipes into the wall of the manhole at the required

Manholes

elevations.

- C. Manhole sections shall be constructed without manhole steps.
- D. Masonry work required to complete the precast concrete manhole shall be done in accordance with the provisions of Part 3.01 of this Section.
- E. Fill all joints, lifting holes, and other imperfections inside and outside with non-shrink mortar, overlapping the seam 2" on both sides, to form a neat, smooth finish. Manholes shall be completely waterproof.
- F. Concrete setting time, backfilling, setting frame and cover, temporary paving, etc., shall be in accordance with the applicable requirements of Part 3.01 of this section.

3.4 Testing

- A. Manholes installed in this contract shall be tested prior to backfilling for compliance with the infiltration limits specified for pipe used in this contract. The method used shall be a vacuum test in which manholes are plugged, pumped to 5 psi vacuum, and held for a minimum of one (1) minute. The manhole shall be approved when it loses less than one (1) psi vacuum pressure during the 1 minute test period.

END OF SECTION

Polyvinyl Chloride (PVC) Sewer and Service Pipe

Part 1 General

1.1 Scope of Work

- A. The work covered by this section includes furnishing all labor, equipment, and materials required to install and test polyvinyl chloride (PVC) pipe, including accessories, as shown on the Drawings and/or specified herein.

1.2 Quality Assurance

- A. The Contractor, at the Engineer's request, shall furnish a certificate from the manufacturer of the pipe and fittings that the manufacturer is fully competent and capable of manufacturing PVC sewer pipe, fittings, and accessories of uniform texture and strength that will fully comply with these Specifications and have so manufactured this class of pipe in sufficient quantities to be certain that it will meet all normal field conditions of usage. The manufacturer must have adequate equipment and quality control facilities to be sure that each extrusion of pipe is uniform in texture, dimensions, and strength.
- B. Pipe shall be tested when requested by the Engineer and all pipe so designated shall be tested in accordance with ASTM D 2412 "Standard Method of Test for External Loading Properties of Plastic Pipe by Parallel Plate Loading."
- C. Each length of pipe and each fitting shall have the following data clearly marked on each piece:
 - 1. Manufacturer's name
 - 2. Pipe size
 - 3. PVC compound used
 - 4. ASTM material specification for the PVC compound used

1.3 Shop Drawings and Engineering Data

- A. Complete shop drawings and engineering data shall be submitted to the Engineer in accordance with the requirements of the section entitled "Submittals" of these Specifications.

1.4 Storage and Protection

- A. PVC piping and accessories shall be stored and protected in accordance with the requirements of the section entitled "Storage and Protection" of these Specifications.
- B. PVC pipe and fittings shall be stored under black plastic cover.
- C. All pipe and accessories shall be stored above ground and fully supported so as not to bend or deflect excessively under its own weight.

1.5 Guarantee

The Contractor shall provide a guarantee against defective equipment and workmanship in accordance with the requirements of the section entitled "Guarantees and Warranties" of these Specifications.

Part 2 Products

3.1 PVC Pipe and Fittings

- A. The pipe and fittings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusions, or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density, and other physical properties.
- B. The manufacturer shall provide waterstops, acceptable to the Engineer, which shall be applied to the outside of the plastic pipe when the pipe is to be enclosed in any structure where concrete or mortar is used which will prevent leakage along the outer wall of the barrel of the pipe.
- C. No single piece of pipe shall be laid on any project covered by this Specification unless it is found to be generally straight. Such pipe shall have a maximum ordinate as measured from the concave side of the pipe not to exceed 1/16 inch per foot of length. If the deviation exceeds this requirement, then the particular piece of pipe shall be rejected from use until it can comply with this provision.
- D. Wyes, tees, bends, adapters, and any other fittings required or directed by the Engineer shall be provided. Engineering data for such fittings showing cross-sectional views with dimensions shall be provided and such data and fittings shall be approved by the Engineer prior to their use. The materials used in the manufacture of fittings shall conform to the requirements for the pipe with which they shall be used and any variation of such requirements shall be subject to the approval of the Engineer. Fittings shall have wall thicknesses equal to or greater than that of the pipe to which they are joined.

3.2 Pipe

- A. The 4-inch through 24-inch PVC pipe and accessories shall be manufactured in accordance with the requirements of either ASTM D3034, Type PSM (SDR 35 or less) or ASTM F789, Type PS-46 POLY (Vinyl Chloride) (PVC) Plastic Gravity Flow Sewer Pipe and Fittings.
- B. The standard length of PVC pipe under this Specification shall be 20 feet with a minimum of 10 feet, except that all pipe used in service lines shall not exceed 10 feet in length unless otherwise approved by the Engineer.

3.3 Joints

- A. PVC pipe joints shall be the bell and spigot type subject to the approval of the Engineer.
- B. The pipe joint shall meet ASTM D-3212-81 for joints for drain and sewer pipes using

flexible elastomeric seals, and the seals shall meet ASTM F-477 for elastomeric seals. All gaskets shall be factory installed and positively retained by means of a steel, polypropylene, or PVC ring.

- C. Factory-installed glued gaskets will be acceptable; however, field-installed gaskets will not be acceptable for ASTM D-3034, ASTM F789, or ASTM F-679 PVC pipe. Pipe manufactured according to ASTM F949 is permitted to have a field-installed gasket.

Part 3 Execution

3.1 Pipe Laying

- A. Before sewer pipe is placed in position in the trench, the bottom and sides of the trench shall be carefully prepared and bracing and sheeting installed where required. A mason's line, supported at intervals not exceeding 50 feet, shall be stretched tightly above ground level at a grade parallel to and directly above the axis line of the pipe. Each pipe shall be accurately placed to the exact line and grade called for on the Drawings by measuring down from this line to the invert of the pipe in place. The Contractor shall furnish all labor and materials necessary for erecting batter boards and establishing lines and grades therefor.
- B. The Contractor may use the laser beam method of setting a line and grade for the sewer by using the laser beam coaxially through the center of the sewer being laid. The laser beam projector is to be rigidly mounted to its support platforms, with a two-point suspension, or equivalent, assuring that all ground and equipment vibrations are kept to an absolute minimum. All equipment including equipment necessary to control atmospheric conditions in the pipe to keep line and grade to acceptable standards of accuracy shall be furnished by the Contractor. The laser beam system must be operated by competent experienced men who have been properly trained to operate the equipment used.
- C. The Contractor shall stake check pegs at all manholes throughout the job. Check pegs midway between manholes and any other check points deemed necessary to assure accuracy of the equipment shall be provided by the Contractor.
- D. The Contractor shall stake check pegs at all manholes throughout the job. Check pegs midway between manholes and any other check points deemed necessary to assure accuracy of the equipment shall be provided by the Contractor.
- E. Each piece of pipe and special fitting shall be carefully inspected before it is placed and no defective pipe shall be laid in the trench. Pipe laying shall proceed upgrade, starting at the lower end of the grade and with the bells uphill. No pipe shall be laid except in the presence of an inspector representing the Engineer. Trench bottoms found to be unsuitable for foundations after pipe laying operations have started shall be corrected and brought to exact line and grade with approved compacted materials.
- F. Bell holes shall be of sufficient size to allow ample room for making the pipe joints properly. Bell holes shall not be cut out more than ten joints ahead of pipe laying. The bottom of the trench between bell holes shall be carefully graded so that the pipe barrel will rest on a solid foundation for its entire length as shown on the Drawings. Each joint

Polyvinyl Chloride (PVC) Sewer and Service Pipe

shall be laid so that it will form a close concentric joint with adjoining pipe in order to avoid sudden offsets or inequalities in the flow line.

- G. Water shall not be allowed to run or stand in the trench while pipe laying is in progress or before the joints are completely set or before the trench has been backfilled. The Contractor at no time shall open up more trench than his available pumping facilities are able to dewater. Where sewer pipelines are located in or across stream beds or drainage ditches, the Contractor shall divert the stream flow and dewater each section as the work progresses.
- H. No joints shall be made where pipe or joint material have been soiled by earth in handling until such soiled surfaces are thoroughly cleaned by wire brushing and wiping until all traces of the earth are removed.
- I. As the work progresses, the interior of all pipe shall be kept thoroughly clean. After each line of pipe has been laid, it shall be carefully inspected and all earth, trash, rags, and other foreign matter removed from the interior. A filled bag or other approved type of follower shall be pulled through the line immediately after each joint is made in order to remove any debris which may be left on the inside of the pipe.
- J. Backfilling of trenches shall be started immediately after the pipe in place has been inspected and approved by the Engineer and backfill shall be deposited and compacted as provided under the Section 31 23 33 Trenching, Backfilling, and Compacting for Utilities.
- K. Installation of service pipe shall conform to the appropriate requirements of main line sewers.
- L. Connections of service lines to the main sewer shall be made with bends of the proper degree to make the service run perpendicular to the main sewer. Pipe shall be laid to a uniform line and grade. Minimum grade shall be 1 percent.
- M. Connections of service lines to the main sewer shall be made with bends of the proper degree to make the service run perpendicular to the main sewer. Pipe shall be laid to a uniform line and grade. Minimum grade shall be 1 percent.
- N. The end of all service connections shall be plugged with a PVC plug and sealed with plastic joint material.
- O. Crushed stone bedding and backfill material, concrete encasement and protection, etc., for service line installation shall be provided as conditions require and as directed by the Engineer.
- P. No service connections shall be covered until they have been inspected and located by the Engineer.

3.2 Installation of Tees, Risers, and Plugged Stubs

- A. Tee branches shall be installed in the sewer lines at all places shown on the Drawings, specified herein or otherwise directed by the Engineer. Tee branches on pipe less than 12 inches in diameter shall be cast or extruded and manufactured monolithic with the

barrel.

- B. Riser connections of the size and type shown on the Drawings shall be installed at the locations shown on the Drawings or directed by the Engineer. A plastic film marking tape 5-feet long shall be placed 12 inches over the top of each riser during backfilling to mark the location of the riser. The marking tape shall be heavy gauge polyethylene film (.004-inch thick). Tape shall be standard red color imprinted with the words "Warning-Buried Sewer Line Below." Tape shall be Allen Marking Tape No. AMT-1212 as manufactured by the Allen System Inc., Glen Ellyn, Illinois, or equal. A second marking tape containing a metallic core which can be located with a metal detector shall be laid on top of the first marking tape. This tape shall be 5 feet long and 3 inches wide. Tape shall be Allen Detectotape Catalogue No. ADT-1003 for buried sewer line as manufactured by the Allen System Inc., or equal.
- C. Plugged pipe stubs for future connections to manholes and sewerage structures shall be installed where shown on the Drawings or directed by the Engineer. The pipe stubs shall be installed with the bell encased in the wall of the manhole and the bell opening flush with the outside wall of the manhole or structure. Stubouts shall be the type manufactured by McCullough Industries or an approved equal.
- D. Plugged stubs and such branches of pipelines that are not to be used immediately shall be closed with PVC stoppers held securely in place.
- E. Where specifically directed by the Engineer or shown on the Drawings, connections to reinforced concrete pipe over 18 inches in diameter shall be made in accordance with details shown on the Drawings.

3.3 Connections

- A. If the work consists of the construction of a sewer that is to replace an existing sewer, all of the existing service lines shall be kept in operation and connected to the new line.
- B. Connections shall be made to all existing sewer lines in the vicinity of the work by removing a section of the sewer from the existing line and inserting in the space a tee branch of proper size, or by the construction of a manhole, regulator chamber or other structure as shown on the Drawings.
- C. Connections to existing manholes or inlets where no plugged stubs exist shall be made by cutting a hole in the wall of the existing structure, installing a Kor-N-Seal rubber boot, inserting a length of sewer pipe into the hole, filling around same with concrete or mortar and troweling the inside and outside surfaces of the joint to a neat finish. The bottom of the manhole shall be shaped to fit the invert of the sewer pipe as specified under the Section 33 39 13 Manholes.
- D. Connections to building services shall be made in a neat and workmanlike manner. Cleanout plugs shall be installed, wherever feasible, by making the connections with a standard wye or tee.

3.4 Existing Utilities

- A. All existing sewers, water lines, gas lines, underground conduits, telephone lines,

Polyvinyl Chloride (PVC) Sewer and Service Pipe

sidewalks, curbs, gutters, pavements, electric lines, or other utilities or structures in the vicinity of the work shall be carefully protected by the Contractor from damage at all times. Where it is necessary for the proper accomplishment of the work to repair, remove and/or replace any such utility, the work shall be done under the provisions set forth in the "General Conditions." No Separate payment shall be made for removing and replacing and/or repairing damaged existing sewers; water, gas, electric, telephone lines or conduits; or other utilities, culverts, drains, or conduits or similar existing services or structures. Similar repair and replacement of sidewalks, curbs, gutters, and pavements are provided elsewhere in these Specifications.

- B. Sewers to be installed parallel to any existing or proposed water main shall be laid at least 10 feet, horizontally, from the water main. If conditions prevent the 10-foot separation, the sewer may be constructed closer to a water main if it is laid in a separate trench and if the bottom of the water main at least 18 inches above the top of the sewer.
- C. When sewers cross under water mains, the top of the sewer shall be at least 18 inches below the bottom of the water main. If necessary, the water main shall be relocated to provide this separation or reconstructed with mechanical-joint ductile iron pipe for a distance of 10 feet on each side of the sewer. One full length of water main shall be centered over the sewer so that both joints will be as far from the sewer as possible.
- D. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, both water main and sewer shall be constructed of mechanical-joint ductile iron pipe and shall be pressure tested to assure water tightness.
- E. When sewer lines cross under culverts where the sewer and the culvert are less than 18 inches apart, the sewer line shall be encased in concrete as shown on the Standard Drawings.

3.5 Inspection and Testing

- A. The grade, joints, and alignment shall be true to line and grade after completion of any section of sewer. Joint surfaces shall be smooth. There shall be no visual leakage and the sewer shall be completely free from any cracks and from protruding joint materials, deposits of sand, mortar, or other materials on the inside.
- B. One hundred percent of all PVC pipe 8 inches in diameter and greater shall be deflection tested. The maximum allowable deflection for PVC pipe is 5 percent. After the PVC pipe has been installed and backfilled, the Contractor shall check the deflection by pulling a rigid ball or an Engineer approved 9-arm mandrel sized at 95 percent of the actual inside diameter of the pipe used through the pipe. Deflection tests shall not be conducted before the elapse of 30 days after backfilling. Any pipe not passing the mandrel shall be replaced and rechecked.
- C. Infiltration shall not exceed 25 gallons per 24 hours per inch of diameter per mile of sewer. Contractor shall furnish all supplies, materials, labor, service, etc., needed to make infiltration or exfiltration tests including water. No separate payment will be made for equipment, supplies, material, water, or services.
- D. Any leakage, including active seepage, shall be corrected by removal and replacement of pipe or joint where such leakage exists until the pipelines meet the requirements of

the allowable leakage specifications.

- E. The sewers installed under this contract will be subject to television inspection in accordance with Section 33 01 30.16 of these specifications.
- F. The Contractor shall provide access for the Owner's crews and equipment for the television inspection and shall have his representative present during inspection.
- G. The television work shall be scheduled so as to take advantage of the time when the groundwater table is most likely to cause infiltration. Work shall be scheduled during or after rainy periods rather than after prolonged periods of dry weather. Logs and/or tapes of the inspections will be made available to the Contractor.
- H. All sewer pipe shall be tested using low pressure air testing in accordance with the procedures and standards listed below.
 - 1. Clean pipe to be tested by propelling a snug-fitting inflated rubber ball through pipe with water.
 - 2. Plug all pipe outlets with suitable test plugs. Brace each plug securely to prevent blowouts. As a safety precaution, pressurizing equipment shall include a regulator set at slightly above test pressure to avoid overpressurizing and damaging an otherwise acceptable line. No one shall be allowed in the manhole during testing.
 - 3. Add air slowly to the portion to the pipe installation under test until the internal air pressure is raised to 4.0 psig greater than the average back pressure of any groundwater above the pipe (0.43 psi per foot of groundwater above the pipe invert), but not greater than 9.0 psig.
 - 4. After an internal pressure of 4.0 psig is obtained, allow at least two minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.
 - 5. When pressure decreased to 3.5 psig, start stopwatch. Determine the time in seconds that is required for the internal air pressure to reach 3.0 psig. Minimum permissible holding times for runs of single pipe diameter are indicated in the table in seconds. No separate allowance shall be given for laterals.

Polyvinyl Chloride (PVC) Sewer and Service Pipe

MINIMUM SPECIFIED TIME REQUIRED FOR A 0.5 PSIG
PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED
FOR Q=0.0015 ft³/min.

1 Pipe Dia. (in.)	2 Min. Time (min:sec.)	3 Length For Min. Time (ft.)	4 Time for Longer Length (sec.)	Specification Time for Length (L) Shown (min.:sec.)		
				100 ft.	150 ft.	200 ft.
24	11:20	99	6.837 L	11:24	17:57	22:48

1 Pipe Dia. (in.)	2 Min. Time (min:sec.)	3 Length For Min. Time (ft.)	4 Time for Longer Length (sec.)	Specification Time for Length (L) Shown (min.:sec.)		
				250 ft.	300 ft.	350 ft.
24	11:20	99	6.837 L	28:30	34:11	39:53

1 Pipe Dia. (in.)	2 Min. Time (min:sec.)	3 Length For Min. Time (ft.)	4 Time for Longer Length (sec.)	Specification Time for Length (L) Shown (min.:sec.)		
				400 ft.	450 ft.	500 ft.
24	11:20	99	6.837 L	45:35	51:17	57:59

END OF SECTION

APPENDIX A

CITY OF CHATTANOOGA
LAND DISTURBANCE PERMIT

Michael MacIndoe

From: Aaron Crenshaw
Sent: Friday, January 8, 2021 3:33 PM
To: Michael MacIndoe
Subject: FW: Riverview Park/CGCC #L-20-616

Aaron Crenshaw, P.E.
Fulghum, MacIndoe, & Associates, Inc.
10330 Hardin Valley Road, Suite 201
Knoxville, Tennessee 37932
Direct: 865.251.5070
Main: 865.690.6419
Cell: 865.719.7171
Email: crenshaw@fulghummacindoe.com
www.FulghumMacIndoe.com

From: Aaron Crenshaw
Sent: Thursday, January 7, 2021 9:35 AM
To: Michael MacIndoe <macindoe@fulghummacindoe.com>
Subject: FW: Riverview Park/CGCC #L-20-616

FYI.
I will get the plans printed and mailed this afternoon or tomorrow.

AC

From: City of Chattanooga, TN <noreply@viewpointcloud.com>
Sent: Thursday, January 7, 2021 9:11 AM
To: Aaron Crenshaw <crenshaw@fulghummacindoe.com>
Subject: Katrina Strickland commented on Plans Coordination Note for #L-20-616



City of Chattanooga, TN

Katrina Strickland commented on Plans Coordination Note for #L-20-616

"This project has been approved. Please provide us with 2 sets of plans to be stamped and the contractors information. Thank you, Katrina"

View Details



Powered by the OpenGov platform

Michael MacIndoe

From: Aaron Crenshaw
Sent: Friday, January 8, 2021 3:48 PM
To: Michael MacIndoe
Subject: RE: LDP

Talked to Leslie Haynes with the Land Development Office.

The permit is issued to the contractor. Once we have a contractor selected, we need to send their information to the Land Development Office folks. The project then transfers to the contractor.

The City will contact them and let them know they will need to create their own account with the City's website to access the permit. The contractor will also be notified that the approved plans are ready for pickup and will need to retrieve those from the lobby of the City office. The other copy of approved plans is for the City inspector.

From: Michael MacIndoe <macindoe@fulghummacindoe.com>
Sent: Friday, January 8, 2021 3:32 PM
To: Aaron Crenshaw <crenshaw@fulghummacindoe.com>
Subject: RE: LDP

Good deal. Thanks

Can you please reforward the email we received that indicated it was approved

thanks

From: Aaron Crenshaw <crenshaw@fulghummacindoe.com>
Sent: Friday, January 8, 2021 3:31 PM
To: Michael MacIndoe <macindoe@fulghummacindoe.com>
Subject: RE: LDP

I put a call in to the ladies who are supposed to get the plans stamped approved asking the process for the actual permit. Not certain if we will get it, or if it is something the Contractor will need to pick up. I can let you know as soon as I hear back from them.

Aaron Crenshaw, P.E.
Fulghum, MacIndoe, & Associates, Inc.
10330 Hardin Valley Road, Suite 201
Knoxville, Tennessee 37932
Direct: 865.251.5070
Main: 865.690.6419
Cell: 865.719.7171
Email: crenshaw@fulghummacindoe.com
www.FulghumMacIndoe.com

From: Michael MacIndoe <macindoe@fulghummacindoe.com>
Sent: Friday, January 8, 2021 3:24 PM
To: Aaron Crenshaw <crenshaw@fulghummacindoe.com>
Subject: LDP

Hi AC,

I am updating the appendices in the project manual to include a copy of each respective permit application and the corresponding approval letters.

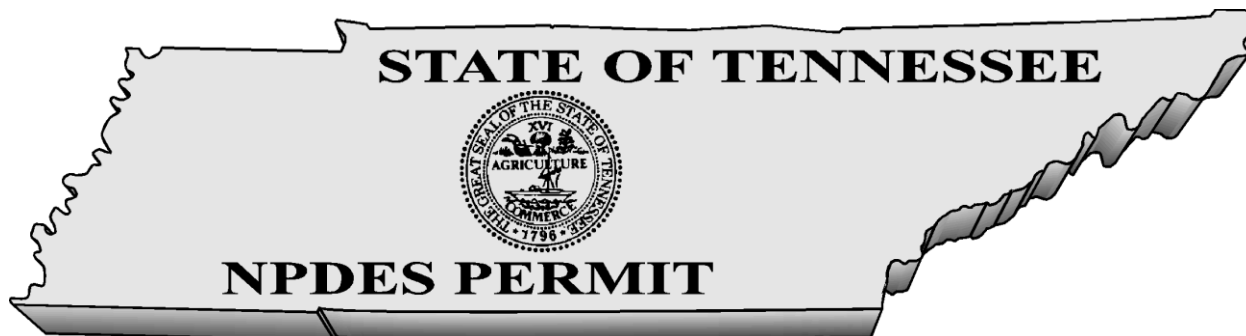
I'm not sure which documents to include for the land development permit.

Thanks
Mac

Michael S. MacIndoe, P.E.
Fulghum, MacIndoe, & Associates, Inc.
10330 Hardin Valley Road, Suite 201
Knoxville, TN 37932
Direct: 865.251.5076
Main: 865.690.6419
Cell: 865.548.6165
Email: macindoe@fulghummacindoe.com
www.FulghumMacIndoe.com

APPENDIX B

TDEC SWPPP/NOI



Tracking Number TNR113576

NOTICE OF COVERAGE UNDER THE GENERAL NPDES PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY (CGP)

Tennessee Department of Environment and Conservation
Division of Water Resources
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, TN 37243

Under authority of the Tennessee Water Quality Control Act of 1977 (T.C.A. 69-3-101 et seq.) and the delegation of authority from the United States Environmental Protection Agency under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251, et seq.):

Name of the Construction Project: **Riverview Park/CGCC SSO Elimination Project (1.3 acres)**
Master Tracking Number at the Site: **TNR113576**
Permittee Name: **City of Chattanooga**
Project Name: **Riverview Park/CGCC SSO Elimination Project**
Contractor(s): **no contractor**
is authorized to discharge: **storm water associated with construction activity**
from site located at: **916 Sterling Avenue, Hamilton County**
to receiving waters named: **Tennessee River**
in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

Likely presence of threatened or endangered species in one mile radius: **YES**

Likely presence of threatened or endangered species downstream: **YES**

Additional pollution prevention requirements apply for discharges into waters which TDEC identifies as:

- Exceptional Tennessee Waters: NO

Your coverage under the CGP shall become effective on **January 4, 2021**, and shall be terminated upon receipt of [Notice of Termination](#).

A copy of the CGP can be obtained from

<https://www.tn.gov/content/tn/environment/permit-permits/water-permits1/npdes-permits1/npdes-stormwater-permitting-program/npdes-stormwater-construction-permit.html>



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES

Chattanooga Environmental Field Office
1301 Riverfront Parkway, Suite 206
Chattanooga, TN 37402

Phone 423-634-5745 Statewide 1-888-891-8332 Fax 423-634-6389

January 4, 2021

Mr. Bill C Payne
City Engineer
City of Chattanooga Public Works Department
e-copy: bpayne@chattanooga.gov
1250 Market St., Ste. 2100
Chattanooga, TN 37402

Subject: **NPDES Construction General Permit Tracking No. TNR113576**
 Riverview Park/CGCC SSO Elimination Project
 City of Chattanooga
 Chattanooga, Hamilton County, Tennessee

Dear Mr. Payne:

You recently submitted a Notice of Intent (NOI) form as part of an application package to obtain coverage under a General NPDES Permit for Storm Water Discharges Associated with Construction Activity. The Division of Water Resources (the division) acknowledges receipt of the most recent version of the application for the above referenced project on December 28, 2020. After review, the application was deemed to be complete on January 4, 2021. Enclosed is the Notice of Coverage (NOC) form which shows the site name and location, receiving stream, effective date of coverage, etc.

Contractor Information

You have not identified a contractor on the NOI. You must identify a primary contractor, or contractor otherwise responsible for sediment and erosion controls on the construction site, if appropriate, and submit a revised NOI to this office prior to beginning earth clearing operations onsite. When submitting the NOI, please include the above referenced permit tracking number.

Storm Water Pollution Prevention Plan (SWPPP)

You have submitted a Storm Water Pollution Prevention Plan (SWPPP) as required by Part 1.4.2 of the CGP. Please note that the division has not performed an engineering review of the SWPPP and does not certify whether the SWPPP adequately provides for the pollution prevention requirements at the site as described in the general permit. The division acknowledges that you have submitted a SWPPP that appears to include the required components of a SWPPP. It is the responsibility of all site operators to design, implement, and maintain measures that are sufficient to prevent pollution at the referenced site, and to remain in compliance with the terms and conditions of the general permit.

Threatened and Endangered Species

The receiving stream for the construction site for which the NOI was submitted has Federal or State listed threatened and endangered species in the area, or downstream of your project. Stormwater discharges and stormwater discharge-related activities that are not protective of legally protected listed or proposed threatened or endangered aquatic fauna in the receiving stream(s); or discharges or activities that would result in a 'take' of a Federally listed endangered or threatened fish or wildlife species are not authorized by the General Permit. If the division finds that stormwater discharges or stormwater related activities are likely to result in any of the above effects, the division will deny the coverage under this general permit unless and until project plans are changed to protect the listed species. In addition, discharges from your construction site that result in harm to such species may incur additional fines and penalties from the US Fish and Wildlife Service and/or the Tennessee Wildlife Resources Agency.

Annual Maintenance Fee and Termination of Permit Coverage

Effective July 1, 2014, permit fees for the General Permit have been revised. In addition to new application fee amounts, annual maintenance fees are now required for projects that exceed one year of coverage. Permittees wishing to terminate coverage must submit a completed notice of termination (NOT) form, which is available on the division's construction stormwater webpage at <https://www.tn.gov/content/tn/environment/permit-permits/water-permits1/npdes-permits1/npdes-stormwater-permitting-program/npdes-stormwater-construction-permit.html>.

The division will review the NOT for completeness and accuracy and, when necessary, investigate the site for which the NOT was submitted. The division will notify the applicant that either the NOT form was received and accepted, or that the permit coverage is not eligible for termination and has not been terminated. If applicable, the notification will include a summary of existing deficiencies.

We appreciate your attention to the general construction storm water permit and its requirements. A copy of the CGP can be obtained from <https://www.tn.gov/content/tn/environment/permit-permits/water-permits1/npdes-permits1/npdes-stormwater-permitting-program/npdes-stormwater-construction-permit.html>. We believe this does make a difference to the quality of state waters. If you have any questions, please contact Natalie Lankford at (423) 634-5709 or by e-mail at Natalie.Lankford@tn.gov.

Sincerely,



Jennifer Innes
Environmental Program Manager

cc: DWR, Chattanooga EFO Permit File
Mr. Aaron Crenshaw, P.E., Fulghum, MacIndoe & Associates, Inc., crenshaw@fulghummacindoe.com
Mr. Jeremy Swilley, Construction Program Supervisor, Chattanooga Land Development Office,
jswilley@chattanooga.gov

**RIVERVIEW PARK/CGCC
CHRONIC SSO ELIMINATION PROJECT
Chattanooga, TN**

**Stormwater Pollution Prevention Plan (SWPPP)
and Notice of Intent (NOI)**

Submitted to

TDEC

Submitted for

City of Chattanooga

Date

December 28, 2020

FMA Project No. 649.001

Submitted By:



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Certification

This Stormwater Pollution Prevention Plan (SWPPP) is developed in accordance with the Tennessee General NPDES Permit (TNR100000) for stormwater discharges associated with Construction Activity (TNCGP), and is prepared using sound engineering practices. As instructed by subpart 2.7 of the TNCGP, this plan and its attachments are hereby submitted to the local Environmental Field Office (EFO), along with the complete Notice of Intent (NOI). Typically, construction will not be initiated prior to 30 days from the date of submittal of this document, or prior to receipt of a Notice of Coverage (NOC) from the Tennessee Department of Environment and Conservation (TDEC).

Owner/Developer: City of Chattanooga – Wastewater Capital Improvements Program
Attn: William C. Payne
1250 Market Street, Suite 2100
Chattanooga, TN 37402
Office: (423) 643-6160

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Signed:  _____ Date: 12-11-2020

Printed Name: William C. Payne

Primary Contractor: _____

I certify under penalty of law that I have reviewed this document, any attachments, and the SWPPP referenced above. Based on my inquiry of the construction site owner/developer identified above, and/or my inquiry of the person directly responsible for assembling this NOI and SWPPP, I believe the information submitted is accurate. I am aware that this NOI, if approved, makes the above-described construction activity subject to NPDES permit number TNR100000, and that certain of my activities on-site are thereby regulated. I am aware that there are significant penalties, including the possibility of fine and imprisonment for knowing violations and for failure to comply with these permit requirements. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.)

Signed: _____ Date: _____

1. General Information

Current versions of this SWPPP, NOI, and the NOC will be kept on-site for the duration of the project. These items will be available for the use of operators and site personnel involved with visiting the site. A notice will be posted near the construction entrance containing a copy of the NOC with the tracking number assigned by the EFO, the name, company name, telephone number, and address of the project site owner or a local contact person for the development, and a brief description of the project. Also, the erosion and sediment control inspector will post on site a certificate stating that the inspector has successfully completed the Fundamentals of Erosion Prevention and Sediment Control course offered by TDEC.

Any new contractor on the project that has any responsibility to install, inspect, or maintain erosion or sediment control measures will sign the contractor's certification on a copy of the NOI (Attachment 1) and will submit it to the local EFO. Any correspondence with TDEC or any EFO will reference the tracking number assigned to the project. The Contractor will submit a Notice of Termination (NOT) after the complete installation and successful establishment of the final stabilization activities have occurred at the site.

It is the intent and goal of the TNCCGP and this SWPPP that stormwater discharge from the property described in this document causes no objectionable color contrast to the water body that receives it. The construction activity will be carried out in such a manner as to prevent discharge that would cause a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of the waters on the property or downstream of the property for fish and aquatic life, livestock watering and wildlife, recreation, irrigation, navigation, or industrial or domestic water supply. Should any discoloration occur prior to effluent leaving the site the contractor is advised to use a polyacrylamide in the influent waters just upstream of the sediment basin/pond/trap.

This plan may be amended for reasons described herein, or for other reasons. When the plans are revised, the contractor will implement the changes to erosion prevention and sediment controls within 48 hours after the need for modification is identified.

2. Site Description

This section provides a description of the existing site conditions and a description of the proposed project.

2.1. Existing Site Conditions

The project area is linear, starting in the east end of the Heritage Landing subdivision, at the parking lot for the pool and tennis courts off Constitution Drive. The route continues east across holes 5 and 6 of the Chattanooga Golf and Country Club (CGCC), then turns north along the drainage channel and access road to the intersection with Sterling Avenue. The existing area is subdivision and golf course. Ground cover consists of open grass, landscaped areas, paved drives, and some unmaintained wooded area. The average slope of the site is 5%.

Runoff from the site drains to the Nickajack Reservoir of the Tennessee River, which is a 303(d) listed stream for PCBs and Dioxin. The Nickajack Reservoir will not be impacted by this proposed development and will remain in its current condition after the construction of this project.

There are no known sinkholes located within the proposed construction area.

2.2. Project Description

This SWPPP pertains to site development as it relates to utilities excavation and trenching and disturbance by construction equipment. Access to the site will be provided from Sterling Avenue on the east end of the project area. The total disturbed area from the activities described above will be approximately 1.3 acres.

Soil disturbing activities will include clearing and grubbing, installing perimeter and other erosion controls, and utility excavation. The anticipated schedule for construction activities is from January 2021 to June 2021.

If any unpermitted off-site storage or borrow areas are needed, they will be included in a revised SWPPP. The appropriate erosion prevention and sediment control measures will be installed and maintained while these areas are active. Permanent stabilization measures will be installed prior to the close of the project.

Soils that will be used for fill will be material that is free of rock or gravel larger than 4 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. These soils will have a plasticity index (PI) less than or equal to 30, a liquid limit less than 60, and a minimum dry density of 90 pounds per cubic foot (pcf).

Control of stormwater runoff for the developed site will be provided via the existing area drains, curb inlets, pipes, and drainage channel.

Reference the construction plans for a general location map, site plan, site details, and for an identification of outfall points of stormwater discharge from the site. There are no non-stormwater discharges on the proposed site. When dewatering open trenches after a rainfall event, the water will be filtered through a filter bag or other device in order to remove suspended sediment before the water is released off – site.

No construction activities related to this project shall take place within a stream without obtaining the proper Aquatic Resource Alteration Permit (ARAP) from TDEC.

3. Spills and Non-Stormwater Contingencies

Fueling of equipment and vehicles on-site will be conducted near the construction entrance/staging area. Spills will be removed immediately. Contaminated soils will be placed on heavy plastic and covered or placed into approved containers to prevent contact with stormwater. Fuel tanks will be located within a designated area. Oils, other vehicle fluids, paints, and solvents will be stored in the construction trailer or other covered

Riverview Park CGCC SSO Elimination

structure. Any spills in excess of 2-gallons will be reported to a representative of project Contractor or Owner.

Materials and equipment necessary for spill cleanup will be kept in the material storage area on-site. Equipment and materials may include, but will not be limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.

If a release containing a hazardous substance in an amount equal to or in excess of a reporting quantity established under either 40 CFR 117 or 40 CFR 302 occurs during a 24-hour period, the Contractor will immediately notify the permittee who shall then notify the National Response Center (NRC) at 800-424-8802, the Tennessee Emergency Management Agency (TEMA) at 800-262-3300 for emergencies or 800-262-3400 for non-emergencies, and the Chattanooga EFO in accordance with the requirements of 40 CFR 117 or 40 CFR 302.

Within 14 days of knowledge of discharge, permittee must provide to the EFO a written description of the date of release and the circumstances leading to the release.

In the event that a release occurs, the Contractor will prepare a revision of this document to identify measures to prevent the reoccurrence of such releases and how to clean-up the spill if there is another one. A description of the spill, what caused it and the clean-up measures will also be included.

Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum wash water on the site unless appropriate provisions are provided.

Each contractor is responsible to provide litter control for trash generated by their crew(s). A dumpster or other appropriate securely lidded container for garbage will be located near the construction trailer and is limited to garbage and paper trash only.

On-site vehicles and mechanical equipment will be monitored for leaks and receive regular preventive maintenance to reduce the potential of leakage. Petroleum products will be stored in tightly sealed containers, which are clearly labeled. Asphalt substances used on-site will be applied according to the manufacturer's recommendations. Waste materials will be properly disposed of according to the manufacturer's instructions and in conformance with applicable Local, State, and Federal regulations.

Fertilizers will be applied only in the minimum amounts recommended by the manufacturer or as otherwise specified herein. Once applied, fertilizer will be worked into the soil to limit exposure to stormwater; store fertilizer in a covered shed or other protective enclosure. The contents of used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

Paint containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system but will be properly disposed of according to the manufacturer's instructions and in conformance with applicable Local, State, and Federal regulations.

Other non-stormwater discharges will be directed toward an area of undisturbed vegetation. These include discharges that are expected from the site during the construction period such as water from water line flushings.

Non-stormwater discharges not specifically listed in this section are prohibited, unless specifically allowed by the Construction General Permit and adequate pollution prevention measures are utilized.

4. Construction Sequencing

The erosion and sediment control best management practices identified in this SWPPP and as shown on the construction plans will be installed in accordance with the Tennessee Erosion and Sediment Control Handbook, latest revision and per Chattanooga/Hamilton County regulations. No soil disturbance activities may take place prior to TDEC's issuance of a Notice of Coverage.

4.1. Anticipated Schedule

Clearing, grading, and construction of the proposed improvements will be accomplished in the following sequence and will include the following erosion control measures as a minimum:

Table 1. Estimated Project Schedule

Construction Activity	Estimated Beginning Date	Erosion & Sediment Control Measures
Initial BMP's	January 2021	Silt fence, temporary inlet protection, & construction entrance
Cut sod, Strip/Stockpile Topsoil	January 2021	Silt fence, erosion control wattles, temporary inlet protection, & construction entrance
Utility Construction	January 2021	Silt fence, erosion control wattles, temporary inlet protection, & construction entrance
Stabilize Paved Areas	March 2021	Silt fence, erosion control wattles, temporary inlet protection, construction entrance, & paving
Stabilize Lawn Areas	March 2021	Silt fence, erosion control wattles, temporary inlet protection, construction entrance, & permanent seeding and sod
Complete construction	June 2021	Remove all temporary EC items

4.2. Erosion and Sediment Control Measures

The appropriate erosion and sediment control structures will be installed per the erosion control plan prior to any land disturbance activities beginning. The erosion and sediment control devices have been designed for a 5-year, 24-hour storm event. Temporary erosion control measures may be removed at the beginning of the workday but must be replaced at the end of the workday.

Construction entrance/exit: temporary sediment control devices installed wherever construction traffic leaves an active construction site. Reference the erosion prevention and sediment control plans for specific type. A construction exit will be installed for ingress and egress off of Sterling Avenue prior to land disturbing activities. Contractor will implement appropriate measures to prevent/minimize the tracking of dirt into the right-of-way. Any sediment deposited in the right-of-way will be removed promptly.

Silt fence: temporary, permeable sediment barrier typically constructed of woven geotextile fabric supported by steel or hardwood posts, buried at the bottom, and erected near small disturbed areas to capture sediment from sheet flow. Silt fencing shall remain in place and be properly maintained during all grading activities until permanent stabilization of the site is established. Reference the plans for location.

Inlet protection: temporary device installed at the entrance to a storm drain to prevent sediment from construction sites from getting into the storm drain system. Reference the plans for specific type and location.

Temporary vegetation: annual plants that are adapted to site conditions and that sprout and grow rapidly. Stabilization will be completed within 14 days (7 days for > 35% slopes) on portions of the site where construction activities have temporarily ceased. The temporary seed shall be Rye (grain) applied at the rate of 120 lbs. per acre. Prior to seeding, 2,000 lbs. of ground agricultural limestone and 1,000 lbs. of 10-10-10 fertilizer shall be applied to each acre to be stabilized. After seeding, each area will be mulched with straw at rate of 100 lbs/1000 S.F. over the seeded areas. Where practical, the straw mulch is to be tacked into place by a disk with blades set nearly straight. Erosion control matting will be used on steep slopes as necessary to ensure sufficient stabilization. Areas of the site which are to be paved will be temporarily stabilized by applying stone sub-base until bituminous pavement can be applied.

Topsoil will be removed from the work areas, stockpiled, and immediately seeded. Clearing and grubbing will be kept to a minimum necessary to accomplish the work within the particular work area. The contractor is encouraged to clear the site in phases to minimize exposed areas. The contractor shall leave the existing vegetation in place until a maximum of 10 days prior to grading activities. For areas of the site that are to receive permanent vegetation, a minimum of 6-inches of topsoil will be placed prior to applying seed and mulch.

Permanent vegetation: annual plants to control erosion by physically protecting a bare soil surface from raindrop impact, flowing water, and wind. Stabilization will be completed within 14 days (7 days for > 35% slopes) on portions of the site where construction activities have permanently ceased. The permanent seed shall be drought tolerant, hybrid

Kentucky 31 (Jaguar, Lancer, Rebel II, Falcon II, Etc.). Seed at a rate of 6-8 lbs./1000 S.F. use a slow release starter fertilizer with 1 lbs./1000 S.F. nitrogen. If grading is performed during the winter months, seed mixture shall be supplemented with a winter rye or other appropriate mixture to assure stabilization during the winter season. After seeding, each area will be mulched with straw at rate of 100 lbs/1000 S.F. over the seeded areas. Where practical, the straw mulch is to be tacked into place by a disk with blades set nearly straight. Erosion control matting will be used on steep slopes as necessary to ensure sufficient stabilization.

5. Maintenance and Inspections

This section describes the maintenance and inspection practices for the site and the site assessment for quality assurance.

5.1. Maintenance and Inspection Practices

The following maintenance and inspection practices will be used to maintain erosion prevention and sediment controls:

Disturbed areas that have not been finally stabilized, areas used for storage of materials exposed to precipitation, structural control measures, locations where vehicles enter and exit the site, and all points of outfall will be inspected in anticipation of a storm event, at least twice per week (at least 72 hours apart) and following storm events of 0.5-in. or greater. The inspector is also required to keep a rain gauge at the site and a daily log of the rainfall readings must be maintained.

Control structures will be maintained in good working order; if a repair is necessary, it will be initiated within 7 days of discovery and/or prior to the next rain event;

Built up sediment will be removed from silt fence when it has reached one-third the height of the fence;

Silt fences will be inspected for depth of sediment, tears, security of attachment to the fence posts, and to see that the fence posts are firmly in the ground and upright;

Sediment shall be removed from a sediment control device as needed, but at least when the design capacity has been reduced by 50%.

Diversion dikes will be inspected and any breaches promptly repaired;

Temporary and permanent seeding will be checked for bare spots, washouts, and healthy growth and reseeded shall occur as necessary;

Any off-site accumulation not affecting a stream shall be removed and vegetation returned to original condition. If sediment reaches the stream the permittee must contact the local TDEC office prior to any work within the stream;

A maintenance inspection report will be made after each inspection and include grading dates, cease work dates, stabilization dates, and rainfall amounts;

Inspect all outfall points related to the site and fix as needed. Revise SWPPP as needed to correct the issue;

All 303(d) or high-quality streams must be inspected and recorded on inspection sheet (Attachment 4) and made available on-site. If problems occur TDEC will issue a violation and owner will have 7 days to correct issue. If issue is not corrected in 7 days a "cease work" will be issued.

Inspectors will be certified with a level 1 rating given by TDEC after appropriate training courses have been completed.

The site superintendent will select individuals who will be responsible for inspections, maintenance and repair activities, and filling out the inspection and maintenance reports. These reports must include name, date, observation, and action taken. Reports must be made available on-site.

5.2. Site Assessment

A site assessment for quality assurance of erosion prevention and sediment controls will be conducted at each outfall involving drainage totaling 10 or more acres or 5 or more acres if draining to an impaired or exceptional quality waters, within a month of construction commencing at each portion of the site that drains the qualifying acreage of such portion of the site. The site assessment will be performed by individuals with following qualifications:

- A licensed professional engineer;
- A Certified Professional in Erosion and Sediment Control (CPESC), or;
- A person that successfully completed the "Level II Design Principles for Erosion Prevention and Sediment Control for Construction Sites" course.

As a minimum, site assessment will be performed to verify the installation, functionality and performance of the EPSC measures described in the SWPPP. The site assessment will be performed with the inspector, and will include a review and update (if applicable) of the SWPPP. Modifications of plans and specifications for any building or structure, including the design of sediment basins or other sediment controls involving structural, hydraulic, hydrologic or other engineering calculations will be prepared by a licensed professional engineer or landscape architect and stamped and certified in accordance with the Tennessee Code Annotated, Title 62, Chapter 2 and the rules of the Tennessee Board of Architectural and Engineering Examiners.

The site assessment findings will be documented and the documentation kept with the SWPPP at the site. At a minimum, the documentation will include information included in the inspection form provided in Attachment 4 of this document. The documentation must contain the printed name and signature of the individual performing the site assessment and the following certification:

Riverview Park CGCC SSO Elimination

"I certify under penalty of law that this report and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

The site assessment can take the place of one of the twice weekly inspections.

Attachment 1: Notice of Intent (NOI)



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Division of Water Resources

William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243
1-888-891-8332 (TDEC)

Notice of Intent (NOI) for General NPDES Permit for Stormwater Discharges from Construction Activities (TNR100000)

Form containing fields for Site or Project Name, NPDES Tracking Number, Street Address, Site Description, County, MS4 Jurisdiction, Construction Start/End Dates, Latitude/Longitude, Acres Disturbed, Total Acres, Receiving waters, SWPPP status, Site Owner/Developer information, Contact information, and various certifications.

OFFICIAL STATE USE ONLY

Form for official state use only, including fields for Received Date, Reviewer, Field Office, Permit Tracking Number, Exceptional TN Water, Fee(s), T & E Aquatic Flora/Fauna, SOS Corporate Status, Waters with Unavailable Parameters, and Notice of Coverage Date.

CONSTRUCTION GENERAL PERMIT - NOTICE OF INTENT (NOI) - INSTRUCTIONS

A completed NOI must be submitted to obtain coverage under the CGP. **Requesting coverage under this permit means that an applicant has obtained and examined a copy of this permit, and thereby acknowledges applicant's claim of ability to be in compliance with permit terms and conditions.** CGP coverage is required for stormwater (SW) discharge(s) from construction activities including clearing, grading, filling and excavating (including borrow pits) of one or more acres of land. This form should be submitted at least 30 days prior to the commencement of land disturbing activities, or no later than 48 hours prior to when a new operator assumes operational control over site specifications or commences work at the site.

The application fee must accompany the NOI and is based on total acreage to be disturbed by an entire project, including any associated construction support activities (e.g., equipment staging yards, material storage areas, excavated material disposal areas, borrow or waste sites, etc.). A separate annual maintenance fee is also required for activities that exceed 1 year under CGP coverage. See TN Rules, Chapter 0400-40-11-.02(b)(12).

Acres Disturbed	= or > 150 acres	= or > 50 < 150 acres	= or > 20 < 50 acres	= or > 5 < 20 acres	= or > 1 < 5 acres	Subsequent coverage
Fee	\$10,000	\$6,000	\$3,000	\$1,000	\$250	\$100

Who must submit the NOI form? All site operators must submit an NOI form. "Operator" for the purpose of this permit and in the context of SW associated with construction activity means any person associated with a construction project who meets either or both of the following two criteria: (1) The person has operational or design control over construction plans and specifications, including the ability to make modifications to those plans and specifications. This person is typically the owner or developer of the project or a portion of the project (e.g., subsequent builder), or the person that is the current land owner of the construction site, and is considered the primary permittee; or (2) The person has day-to-day operational control of those activities at a project which are necessary to ensure compliance with a SWPPP for the site or other permit conditions. This person is typically a contractor or a commercial builder who is hired by the primary permittee, and is considered a secondary permittee.

Owners, developers and all contractors that meet the definition of the operator in subsection 2.2 of the permit shall apply for permit coverage on the same NOI, insofar as possible. After permit coverage has been granted to the initial site-wide primary permittee, any subsequent NOI submittals must include the site's previously assigned permit tracking number and the project name. The comprehensive site-specific SWPPP shall be prepared in accordance with the requirements of part 3 of the permit and must be submitted with the NOI unless the NOI being submitted is to add a subsequent permittee to an existing coverage. Artificial entities (e.g., corporations or partnerships) must submit the correct Tennessee Secretary of State, Division of Business Services, control number. **The NOI will be considered incomplete without a correct control number, and the division reserves the right to deny coverage to artificial entities that are not properly registered and in good standing with the Tennessee Secretary of State.**

Complete the form: Type or print clearly. Answer each item or enter "NA," for not applicable. If you need additional space, attach a separate piece of paper to the NOI form. **The NOI will be considered incomplete without a permit fee and comprehensive site-specific SWPPP (if applicable).**

Describe and locate the project: Use the legal or official name of the construction site. If a construction site lacks street name or route number, give the most accurate information available to describe the location (reference to adjacent highways, roads and structures; eg., intersection of state highways 70 and 100). Latitude and longitude (in decimal degrees) can be found at numerous other web sites. Attach a copy of a map, showing location of site, with boundaries at least one mile outside the site boundaries. Provide estimated starting date of clearing activities and completion date of the project, and an estimate of the number of acres of the site on which soil will be disturbed, including borrow areas, fill areas, stockpiles and the total acres. For linear projects, give location at each end of the construction area.

Name of the receiving waters: Trace the route of SW runoff from the site and determine the name of the water course(s) into which the stormwater runoff drains. Note that the receiving water course may or may not be located on the construction site. If the first water body receiving construction site runoff is unnamed ("unnamed tributary"), determine the name of the waterbody that the unnamed tributary enters.

An ARAP may be required: **If your work will disturb or cause alterations of a stream or wetland, you must obtain an appropriate Aquatic Resource Alteration Permit (ARAP).** If you have a question about the ARAP program, contact your local Field Office (EFO).

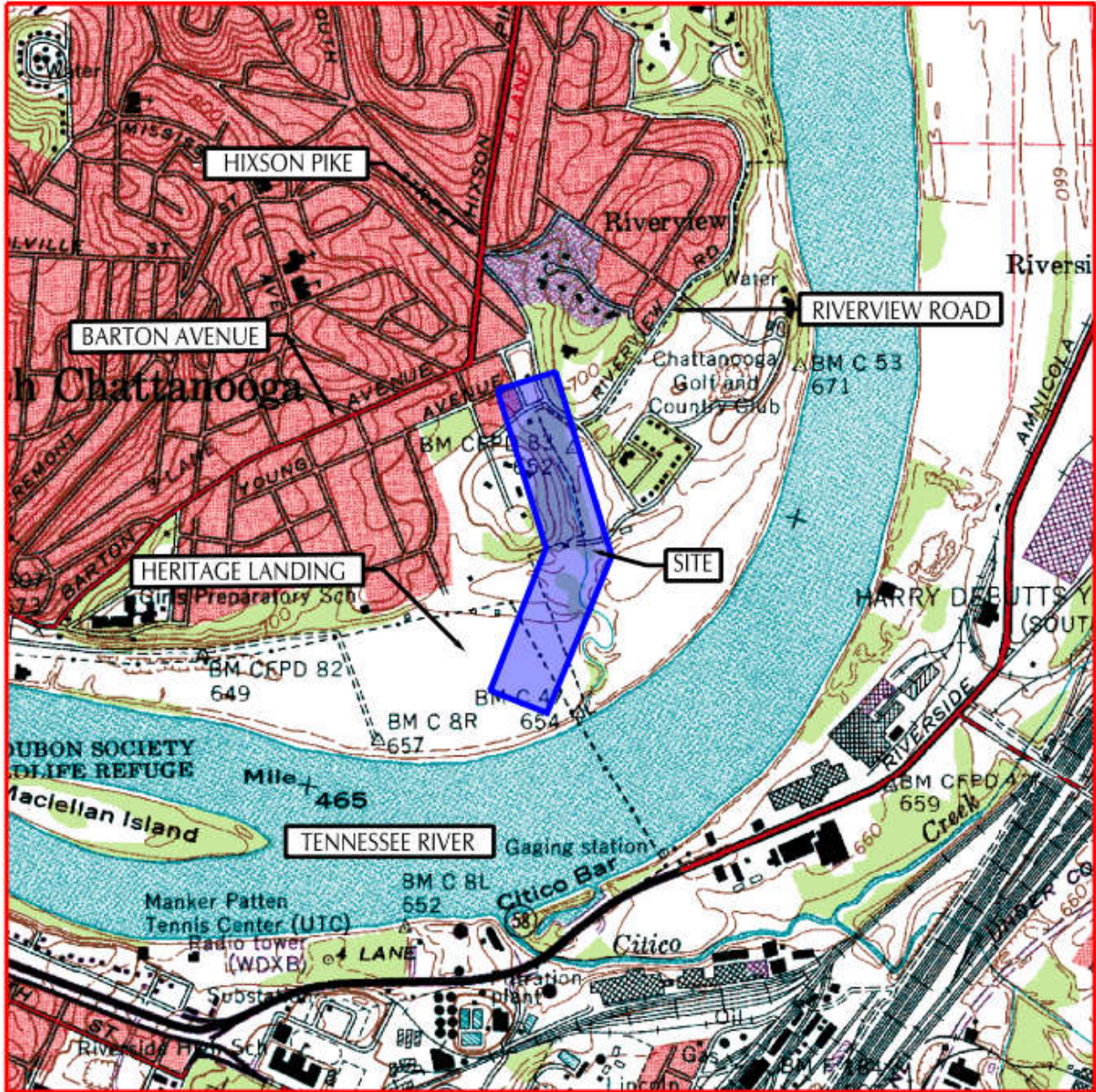
Submitting the form and obtaining more information: Note that this form must be signed by the company President, Vice-President, or a ranking elected official in the case of a municipality, for details see subpart 2.5. For more information, contact your local EFO at the toll-free number 1-888-891-8332 (TDEC). Submit the completed NOI form (keep a copy for your records) to the appropriate EFO for the county(ies) where the construction activity is located, addressed to **Attention: Stormwater NOI Processing.**

Notice of Coverage: The division will review NOIs for completeness and accuracy and issue an NOC to site-wide primary operators, authorizing SW discharge from the construction site as of the effective date of the NOC. New subsequent operators will not receive an NOC, but are considered covered under the permit when their permit record is published on TDEC's dataviewer as "active" and with an effective date. TDEC Permit Dataviewer can be found at: http://environment-online.tn.gov:8080/pls/enf_reports/f?p=9034:34001:0

EFO	Street Address	Zip Code	EFO	Street Address	Zip Code
Memphis	8383 Wolf Lake Drive, Bartlett	38133-4119	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305-4316	Chattanooga	1301 Riverfront Pkwy, Suite 206	37402
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601

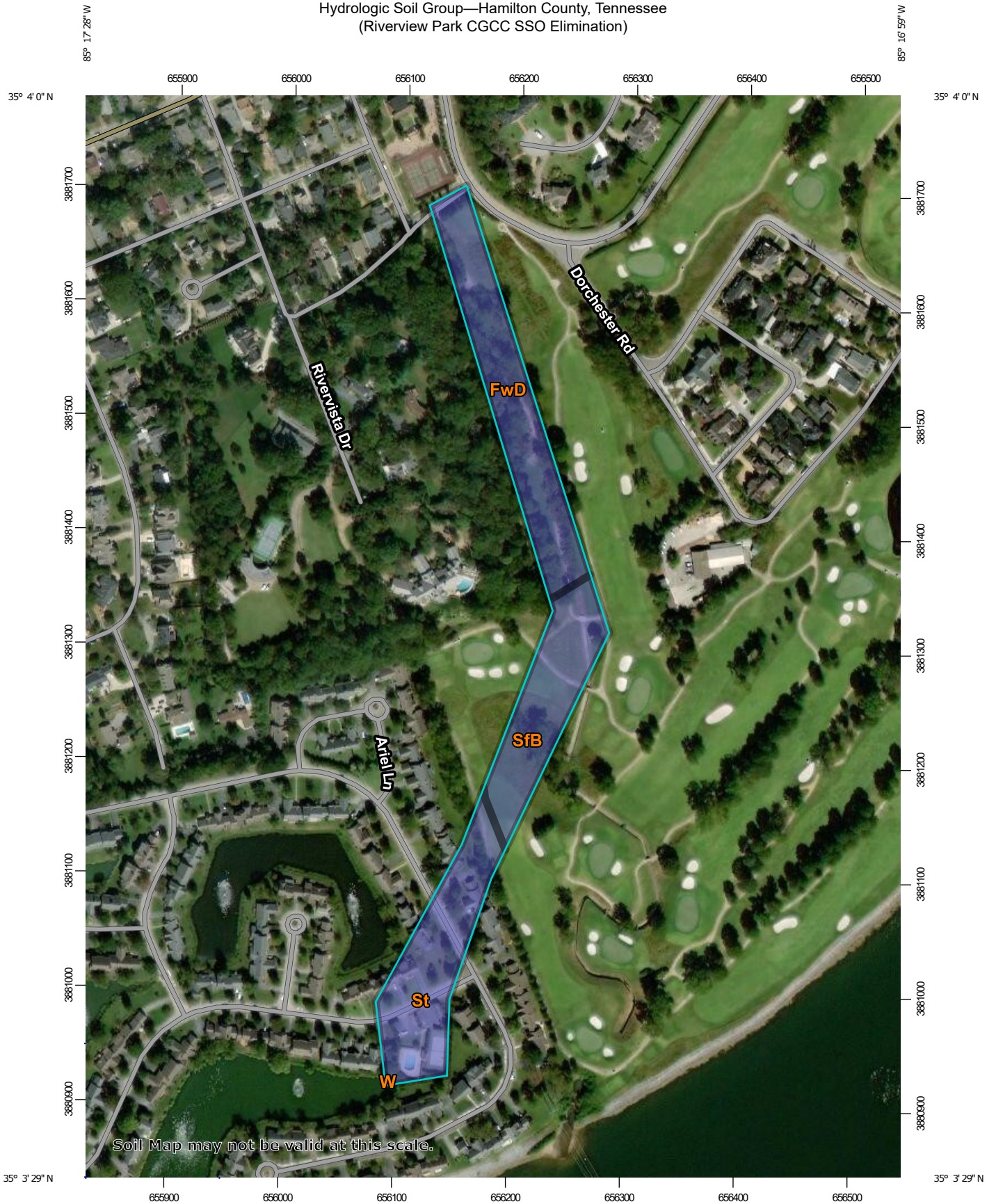
Attachment 2: USGS Quadrangle Map

Chattanooga Quad

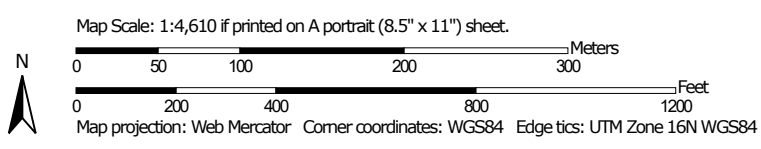


Attachment 3: NRCS Soil Map

Hydrologic Soil Group—Hamilton County, Tennessee
(Riverview Park CGCC SSO Elimination)



Soil Map may not be valid at this scale.



Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
FwD	Fullerton-Urban land complex, 3 to 40 percent slopes	B	3.4	38.7%
SfB	Sequatchie-Urban land complex, 2 to 7 percent slopes	B	2.5	28.1%
St	Staser loam	B	2.9	33.1%
W	Water		0.0	0.1%
Totals for Area of Interest			8.9	100.0%

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Attachment 4: Inspection Report Form



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC)

Division of Water Resources

William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243

1-888-891-8332 (TDEC)

General NPDES Permit for Stormwater Discharges from Construction Activities (CGP)

Construction Stormwater Inspection Certification (Twice-Weekly Inspections)

Site or Project Name:		NPDES Tracking Number: TNR
Primary Permittee Name:		Date of Inspection:
Current approximate disturbed acreage:	Has rainfall been checked/documented daily? Yes No	Name of Inspector:
Current weather conditions:		Inspector's Training Certification Number:

Please check the box if the following items are on-site:

Notice of Coverage (NOC)	Stormwater Pollution Prevention Plan (SWPPP)	Twice-weekly inspection documentation
Site contact information	Rain Gage	Off-site Reference Rain Gage Location: _____

Best Management Practices (BMPs):

Are the Erosion Prevention and Sediment Controls (EPSCs) functioning correctly: If "No," describe below in Comment Section

1. Are all applicable EPSCs installed and maintained per the SWPPP?	Yes	No
2. Are EPSCs functioning correctly at all disturbed areas/material storage areas per section 4.1.5?	Yes	No
3. Are EPSCs functioning correctly at outfall/discharge points such that there is no objectionable color contrast in the receiving stream, and no other water quality impacts per section 5.3.2?	Yes	No
4. Are EPSCs functioning correctly at ingress/egress points such that there is no evidence of track out?	Yes	No
5. If applicable, have discharges from dewatering activities been managed by appropriate controls per section 4.1.4? If "No," describe below the measures to be implemented to address deficiencies.	Yes	No
6. If construction activity at any location has temporarily/permanently ceased, was the area stabilized within 14 days per section 3.5.3.2? If "No," describe below each location and measures taken to stabilize the area(s)	Yes	No
7. Have pollution prevention measures been installed, implemented, and maintained to minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters per section 4.1.5? If "No," describe below the measures to be implemented to address deficiencies.	Yes	No
8. If a concrete washout facility is located on site, is it clearly identified on the project and maintained? If "No," describe below the measures to be implemented to address deficiencies.	N/A	Yes No
9. Have all previous deficiencies been addressed? If "No," describe remaining deficiencies in Comment section. Check if deficiencies/corrective measures have been reported on a previous form.	Yes	No

Comment Section. If the answer is "No" for any of the above, please describe the problem and corrective actions to be taken. Otherwise, describe any pertinent observations:

Certification and Signature (must be signed by the certified inspector and the permittee per Sections 3.5.8.2 (g) and 7.7.2 of the CGP)

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Inspector Name and Title:	Signature:	Date:
Primary Permittee Name and Title:	Signature:	Date:

Construction Stormwater Inspection Certification Form (Twice-Weekly Inspections)

Purpose of this form/ Instructions

An inspection, as described in section 3.5.8.2. of the General Permit for Stormwater Discharges from Construction Activities ("Permit"), shall be performed at least twice every calendar week and documented on this form. Inspections shall be performed at least 72 hours apart. Where sites or portion(s) of construction sites have been temporarily stabilized, or runoff is unlikely due to winter conditions (e.g., site covered with snow or ice), such inspection only has to be conducted once per month until thawing results in runoff or construction activity resumes.

As described in section 3.5.8.1 of the Permit, inspectors performing the required twice weekly inspections must have an active certification by completing the "Fundamentals of Erosion Prevention and Sediment Control Level I" course (<http://www.tnepsc.org/>). Twice weekly inspections can also be performed by: a licensed professional engineer or landscape architect; a Certified Professional in Erosion and Sediment Control (CPESC) or a person who has successfully completed the "Level II Design Principles for Erosion Prevention and Sediment Control for Construction Sites" course. A copy of the certification or training record for inspector certification should be kept on site.

Qualified personnel, (provided by the permittee or cooperatively by multiple permittees) shall inspect disturbed areas of the construction site that have not been finally stabilized, areas used for storage of materials that are exposed to precipitation, structural control measures, locations where vehicles enter or exit the site, and each outfall.

Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the site's drainage system. Erosion prevention and sediment control measures shall be observed to ensure that they are operating correctly.

Outfall points (where discharges leave the site and/or enter waters of the state) shall be inspected to determine whether erosion prevention and sediment control measures are effective in preventing significant impacts to receiving waters. Where discharge locations are inaccessible, nearby downstream locations shall be inspected. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

Based on the results of the inspection, any inadequate control measures or control measures in disrepair shall be replaced or modified, or repaired as necessary, before the next rain event if possible, but in no case more than 7 days after the need is identified.

Based on the results of the inspection, the site description identified in the SWPPP in accordance with section 3.5.1 of the Permit and pollution prevention measures identified in the SWPPP in accordance with section 3.5.2 of the Permit, shall be revised as appropriate, but in no case later than 7 days following the inspection. Such modifications shall provide for timely implementation of any changes to the SWPPP, but in no case later than 14 days following the inspection.

All inspections shall be documented on this Construction Stormwater Inspection Certification form. Alternative inspection forms may be used as long as the form contents and the inspection certification language are, at a minimum, equivalent to the division's form and the permittee has obtained a written approval from the division to use the alternative form. Inspection documentation will be maintained on site and made available to the division upon request. Inspection reports must be submitted to the division within 10 days of the request.

Trained certified inspectors shall complete inspection documentation to the best of their ability. Falsifying inspection records or other documentation or failure to complete inspection documentation shall result in a violation of this permit and any other applicable acts or rules.

Attachment 5: Notice of Termination (NOT)



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC)

Division of Water Resources

William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243
1-888-891-TDEC (8332)

Notice of Termination (NOT) for General NPDES Permit for Stormwater Discharges from Construction Activities (CGP)

This form is required to be submitted when requesting termination of coverage from the CGP. The purpose of this form is to notify the TDEC that either all stormwater discharges associated with construction activity from the portion of the identified facility where you, as an operator, have ceased or have been eliminated; or you are no longer an operator at the construction site. Submission of this form shall in no way relieve the permittee of permit obligations required prior to submission of this form. Please submit this form to the local DWR Environmental Field Office (EFO) address (see table below). For more information, contact your local EFO at the toll-free number 1-888-891-8332 (TDEC).

Type or print clearly, using ink.

Site or Project Name:	NPDES Tracking Number: TNR
Street Address or Location:	County(ies):

Name of Permittee Requesting Termination of Coverage:			
Permittee Contact Name:		Title or Position:	
Mailing Address:		City:	State: Zip:
Phone:		E-mail:	

Check the reason(s) for termination of permit coverage:

<input type="checkbox"/>	Stormwater discharge associated with construction activity is no longer occurring and the permitted area has a uniform 70% permanent vegetative cover OR has equivalent measures such as rip rap or geotextiles, in areas not covered with impervious surfaces.
<input type="checkbox"/>	You are no longer the operator at the construction site (i.e., termination of site-wide, primary or secondary permittee coverage).

Certification and Signature: (must be signed by president, vice-president or equivalent ranking elected official)

I certify under penalty of law that either: (a) all stormwater discharges associated with construction activity from the portion of the identified facility where I was an operator have ceased or have been eliminated or (b) I am no longer an operator at the construction site. I understand that by submitting this notice of termination, I am no longer authorized to discharge stormwater associated with construction activity under this general permit, and that discharging pollutants in stormwater associated with construction activity to waters of the United States is unlawful under the Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act.

For the purposes of this certification, elimination of stormwater discharges associated with construction activity means that all stormwater discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have been eliminated from the portion of the construction site where the operator had control. Specifically, this means that all disturbed soils at the portion of the construction site where the operator had control have been finally stabilized, the temporary erosion and sediment control measures have been removed, and/or subsequent operators have obtained permit coverage for the site or portions of the site where the operator had control.

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Permittee name (print or type):	Signature:	Date:
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EFO	Street Address	Zip Code	EFO	Street Address	Zip Code
Memphis	8383 Wolf Lake Drive, Bartlett, TN	38133	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305	Chattanooga	1301 Riverfront Parkway, Ste. 206	37402
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601

APPENDIX C

TDEC ARAP



Under the Aquatic Resource Alteration
General Permit for Utility Line Crossings

Tennessee Department of Environment and Conservation
Division of Water Resources
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville TN 37243

ARAP - NR2001.131

Under authority of the Tennessee Water Quality Control Act of 1977 (TWQCA, T.C.A. 69-3-101 et seq.) the Division of Water Resources has determined the activity described below would not violate applicable water quality standards.

This activity is governed by the *General Permit for Utility Line Crossings* issued pursuant to the TWQCA. The work must be accomplished in conformance with accepted plans, specifications, data and other information submitted in support of application NR2001.131 and the terms and conditions set forth in the above referenced general permit.

PERMITTEE: City of Chattanooga

AUTHORIZED WORK: replacement of existing sewer line with open trench crossing

LOCATION: 916 Sterling Avenue, Hamilton County
Latitude: 35.0652 Longitude: -85.2875

WATERBODY NAME: Tributary to Tennessee River (Nickajack Reservoir)

EFFECTIVE DATE: 16-NOV-20 **EXPIRATION DATE:** 07-APR-25

This does not preclude requirements of other federal, state or local laws. In particular, work shall not commence until the applicant has received the federal §404 permit from the U. S. Army Corps of Engineers, a §26a permit from the Tennessee Valley Authority or authorization under a Tennessee NPDES Storm Water Construction Permit where necessary. This permit may also serve as a federal §401 water quality certification (pursuant to 33 U.S.C. §1341) since the planned activity was reviewed and the division has reasonable assurance that the activity will be conducted in a manner that will not violate applicable water quality standards (T.C.A. § 69-3-101 et seq. or of § § 301, 302, 303, 306 or 307 of *The Clean Water Act*).

The state of Tennessee may modify, suspend or revoke this authorization should the state determine that the activity results in more than an insignificant degradation of applicable water quality standards or violation of the TWQCA. Failure to comply with permit terms may result in penalties in accordance with T.C.A. §69-3-115.



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
CHATTANOOGA Environmental Field Office
1301 RIVERFRONT PARKWAY, SUITE 206
CHATTANOOGA, Tn 37402

November 16, 2020

Mr. William C. Payne
City of Chattanooga
e-copy: bpayne@chattanooga.gov
1250 Market Street, Suite 2100
Chattanooga, TN 37402

Subject: **General Permit for Utility Line Crossings
Aquatic Resource Alteration Permit (ARAP) NR2001.131
Riverview Park/CGCC SSO Elimination Project
Chattanooga, Hamilton County, Tennessee**

Dear Mr. Payne:

We have reviewed your application for the proposed replacement of existing sewer line with open trench crossing. Pursuant to the *Tennessee Water Quality Control Act of 1977* (T.C.A. § 69-3-101 et seq.) and supporting regulations the Division of Water Resources is required to determine whether the activity described in the attached notice of coverage will violate applicable water quality standards. This permit may also serve as a federal §401 water quality certification (pursuant to 33 U.S.C. §1341).

This activity is governed by the *General Permit for Utility Line Crossings*. The work must be accomplished in conformance with accepted plans and information submitted in support of application NR2001.131 and the limitations and conditions set forth in the *General Permit for Utility Line Crossings* (enclosed). It is the responsibility of the permittee to ensure that all contractors involved with this project have read and understand the permit conditions before the project begins.

Please note that no blasting will be permitted in the excavation of trenches that parallel or lie within 50 feet of a stream or wetland, including all stream crossings. Excavation and fill activities must be separated from flowing waters and all contours must be returned to pre-project conditions. All disturbed areas must be revegetated or otherwise stabilized upon completion of construction.

Annual Maintenance and Coverage Termination

Permittees will be assessed an annual maintenance fee of \$350 for coverages that exceed one year. Please note that this maintenance fee does not grant the right to extend coverage past the expiration date of the General Permit.

Permittees may terminate coverage prior to the expiration date by submitting a completed notice of termination form (NOT), which is available on the division's webpage at http://tdec.tn.gov/etdec/DownloadFile.aspx?row_id=CN-1450. A complete NOT should include photodocumentation of the finished project area. The division will notify the permittee that either the NOT was received and accepted, or that the permit coverage is not eligible for termination (due to existing deficiencies) and has not been terminated.

We appreciate your attention to the terms and conditions of this general permit for aquatic resource alteration. If you have any questions, please contact Ms. Jennifer Innes at (423) 634-5719 or by e-mail at Jennifer.Innes@tn.gov.

Sincerely,



Jennifer Innes
Environmental Program Manager

Encl: NOC and copy of general permit

CC: Chattanooga EFO Permit File

Mr. Michael S. MacIndoe, P.E., Fulghum MacIndoe & Associates, Inc., macindoe@fulghummacindoe.com

Dr. Mounir Minkara, Water Quality Manager, City of Chattanooga MS4 Program,
minkara_m@mail.chattanooga.gov

Tennessee Department of Environment and Conservation
General Aquatic Resource Alteration Permit for
Utility Line Crossings



Effective Date: April 7, 2020
Expiration Date: April 7, 2025

Activities Covered by this Permit

This general permit authorizes the construction, maintenance, repair, rehabilitation or replacement of utility line crossings of streams. This general permit also authorizes horizontal directional drill crossings of wetlands in addition to the maintenance, repair, and rehabilitation of utility line crossings of wetlands. The alteration of wetlands and streams due to construction or easement maintenance of aerial utility lines, including permanent vegetation suppression is not authorized by this general permit. The cumulative number of crossings that may be authorized under this general permit is dependent on the trenching technique, and line alignment in relation to water resources. For example, a greater number of crossing points may be authorized for utility line types that typically involve directional drilling and do not follow surface topography, such as fiber optic, gas transmission, and electric lines, than for gravity sewer lines utilizing traditional blasting or hoe-ramming trenching techniques.

In addition, the following activities may be performed without submittal of an application or written authorization from the division prior to the commencement of work, provided the work is performed in accordance with the applicable terms and conditions of this general permit:

- a. Utility line activities employing non-invasive technologies such as pipe bursting, or slip-lining.
- b. Up to 3 crossings (boreholes) utilizing horizontal directional drilling, provided no Federal or State-listed deemed in need of management, threatened, or endangered aquatic species are located within one-mile of the project location, and all special conditions, including subparts of condition #4 are met.
- c. Utility lines suspended from a culvert, bridge, or similar structure.
- d. Single residential service lines.

Certain activities due to size, location or potential water quality impacts are not covered under this general permit, as described in both the Special and General Conditions sections. Activities not qualifying for authorization under this general permit may be authorized by a standard (individual) permit provided that all requirements of the *Tennessee Water Quality Control Act of 1977* (the *Act*) are met.

Special Conditions

1. Written notification of the commencement of authorized work shall be provided to the local TDEC Environmental Field Office prior to, or within 24 hours after the authorized work has commenced.
2. Provisions shall be made to prevent the loss of stream flow due to fracturing of bedrock.
 - a. Sewer line crossing streams with bedrock streambeds must provide non-erodible fill and cover, such as concrete or controlled low strength materials (flowable fill), and trench plugs at each end of the crossing.

- b. No blasting will be permitted in the excavation of trenches that parallel or lie within 50 feet of a stream or wetland, including all stream crossings.
3. In the case of proposed utility lines that follow the stream gradient or otherwise parallel the stream channel, the number of crossings shall be minimized to the maximum extent practicable
4. Trench plugs will be placed throughout any trench running parallel within 50 feet of a stream channel.
 - a. Trench plugs are barriers placed within an open pipeline excavation in order to slow flow and reduce erosion in the trench and also to prevent the trench from becoming a subsurface drainage path. Since the bedding and embedment are constructed using cohesionless, free-draining soils, a path is created for water to flow easily (French drain effect) alongside the pipe. In areas where there is high groundwater, where the pipeline crosses streams or aquifers, or where the natural groundwater flow would be affected or even diverted by the select material, trench plugs of compacted, cohesive, soils or impervious materials should be constructed at intervals along the pipeline.
 - b. The trench plug area will have a bedding of compacted, cohesive soils or impervious materials (such as concrete or controlled low strength materials a.k.a. flowable fill), whereas the bedding on both sides of the trench plug will have a bedding of uncompacted, cohesionless soil. Trench plugs must have lower permeability than the surrounding native soil.
 - c. Location and spacing of trench plugs:
 - i) Minimum of one trench plug between manholes, and one trench plug at each end of the stream crossing or wetland.
 - ii) The trench plugs between manholes shall be located near the upstream manhole.
5. Crossings that utilize horizontal directional drilling are authorized, provided that:
 - a. Entry and exit locations are at least 50 feet from the stream bank or wetland margin.
 - b. The depth of bore below the streambed is sufficient to reasonably prevent release of drilling fluid, based on the parent material.
 - c. A site-specific contingency and containment plan for inadvertent release of drilling fluid must be received and approved by the Division prior to commencement of work. This plan must include notification to the division within 24 hours after release to surface waters. The site specific contingency and containment plan becomes a part of the application upon which coverage is issued and must be followed in the case of an inadvertent release.
 - d. Alignments with stream or wetland crossings in three or more counties are not authorized by this general permit.
6. A maximum of 5 crossings may be authorized for open trenching techniques and auger boring (jack and bore).
 - a. Sewer line crossing of streams must provide non-erodible fill and cover, such as concrete or controlled low strength materials (flowable fill), and trench plugs at each end of the crossing.
 - b. Manholes shall not be located in wetlands, and must be a minimum of 50 feet from the stream bank.

- c. The entry pit for auger boring shall be no closer than 20 feet from the stream bank or wetland margin.
7. For gravity sewer line installations, as-builts or record drawings of the line installation will be submitted to the division 45 days after completion of the project.
8. The alignment of new utility line crossings shall intersect the stream channel as close to 90 degrees or as perpendicular as possible. Alignment shall be no less than 45 degrees angle from the centerline of the stream.
9. New utility line crossings shall be located such as to avoid permanent alteration or damage to the integrity of the stream channel or wetland. Large trees, steep banks, rock outcroppings etc., should be avoided.
10. The crossing shall be designed to prevent the impoundment or loss of normal or base flows. Base flow is the usual or normal flow of the stream that is supplied primarily by groundwater from springs and seeps, but not affected by rapid runoff during and after rainfall. In the case of streams with bedrock streambeds, special provisions shall be made to prevent the loss of stream flow due to fracturing of the bedrock.
11. The excavation and fill activities associated with the utility line crossing of non-navigable streams shall be kept to a minimum and shall be separated from flowing waters. The crossing shall be constructed in the dry to the maximum extent practicable, by diverting flow utilizing cofferdams, berms, temporary channels or pipes. Temporary diversion channels shall be protected by non-erodible material and lined to the expected high water level. For navigable streams as defined by §10 of the *Rivers and Harbors Act of 1899*, the excavation and fill activities associated with utility line crossing may be accomplished within the flowing water.
12. New construction using open cut crossings of wetlands is not authorized. Maintenance, repair and rehabilitation of existing utility lines in wetlands is authorized provided that all of the following special provisions are met:
 - a. the total amount of excavation or fill within wetlands, including temporary equipment access roads does not exceed 50 cubic yards;
 - b. the wetlands alteration is located within the right of way of the existing utility line; and
 - c. temporary impacts to wetlands shall be mitigated by the removal and stockpiling of the first 12 inches of topsoil, prior to construction. Temporary wetland crossings or access roads shall utilize timber matting. Upon completion of construction activities, all temporary wetland impact areas are to be restored to pre-construction contours, and the stockpiled topsoil spread to restore these areas to pre-construction elevation. Other side-cast material shall not be placed within the temporary impact locations. Permanent vegetative stabilization using native species of all disturbed areas in or near the wetland must be initiated within 14 days of project completion (see also *Landscaping with Natives* at tneppc.org). Non-native, non-invasive annuals may be used as cover crops until native species can be established.
13. All spoil material from trench excavation, bore pits and other earth disturbing activities shall be deposited in an upland location and stabilized within 7 days in order to prevent erosion into waters of the state.

14. All dewatering activities shall be conducted in such a manner as to prevent the discharge of sediment-laden water into waters of the state.
15. Stream bank armoring at open cut crossings shall be minimized to the backfilled, disturbed area and shall in no case exceed 40 linear feet of stream bank. Riprap or concrete shall not line the bed of the channel. Non-erodible fill and cover, such as concrete or controlled low strength materials (flowable fill) required for pipe protection must be the minimum necessary to protect the pipeline, and should be overlain with natural bed material to the maximum extent practicable.

General Conditions

1. The amount of fill, stream channel and bank modifications, or other impacts associated with the activity shall be limited to the minimum necessary to accomplish the project purpose. The permittee shall utilize the least impactful practicable method of construction.
2. All activities must be accomplished in conformance with the approved plans, specifications, data, and other information submitted in support of the ARAP application (form CN-1091) and the limitations, requirements, and conditions set forth herein. Failure to comply with the terms and conditions of this permit is a violation of the Act.
3. Activities, either individually or cumulatively, that may result in greater an appreciable permanent loss of resource values to streams or wetlands are not covered. This general permit shall not be used incrementally to combine with other activities resulting in a net loss of water resource values.
4. Clearing, grubbing, and other disturbance to riparian vegetation shall be kept at the minimum necessary for slope construction and equipment operations. Unnecessary native riparian vegetation removal, including tree removal, is prohibited. Native riparian vegetation must be reestablished in all areas of disturbance outside of any permanent authorized structures after work is completed. Coverage under this permit does not serve to waive any local riparian buffer protection requirement, and permittees are responsible for obtaining any necessary local approval.
5. This activity may not result in the permanent disruption to the movement of fish or other aquatic life upon project completion.
6. Blasting within 50 feet of any jurisdictional stream or wetland is prohibited.
7. Other than those activities described in Special Condition 12, activities that directly impact wetlands, or impair surface water flow into or out of any wetland areas are prohibited.
8. Activities located in a component of the National Wild and Scenic River System or waters designated as Outstanding National Resource Waters are not covered.
9. Activities occurring in known or likely habitat of state or federally listed threatened, endangered, deemed in need of management, or species of special concern may not be authorized without prior coordination with the Tennessee Wildlife Resources Agency (TWRA) and TDEC Division of Natural

Areas (DNA) to determine if any special conditions are required to avoid and/or minimize harm to the listed species or their habitat. Adverse effects to federally listed threatened and endangered species are not authorized by this permit. Permittee is responsible for obtaining prior authorization from the United States Fish and Wildlife Service (USFWS) as required by Section 7 or Section 10 under the Endangered Species Act.

10. Work shall not commence until the permittee has obtained all necessary authorizations pursuant to applicable provisions of section 10 of The Rivers and Harbors Act of 1899, section 404 of the Clean Water Act, section 26a of The Tennessee Valley Authority Act, section 402 of the Clean Water Act (including, but not limited to, an NPDES permit for construction stormwater), or any other federal, state, or local laws.
11. Backfill activities must be accomplished in the least impactful manner possible that stabilizes the streambed and banks to prevent erosion. The completed activities may not disrupt or impound stream flow.
12. The use of monofilament-type erosion control netting or blanket is prohibited in the stream channel, stream banks, or any disturbed riparian areas within 30 feet of top of bank.
13. This permit does not authorize impacts to cultural, historic, or archaeological features or sites.
14. This permit does not authorize access to public or private property. Arrangements concerning the use of public or private property shall be made with the landowner. The permittee is responsible for obtaining any additional permitting or maintenance agreements with other government or public agencies or lands.
15. Where practicable, all activities shall be accomplished in the dry. All surface water flowing towards this work shall be diverted using cofferdams and/or berms constructed of sandbags, clean rock (containing no fines or soils), steel sheeting, or other non-erodible, non-toxic material. All such diversion materials shall be removed upon completion of the work. Any disturbance to the stream bed or banks must be restored to its original condition. As approved after Division review, activities may be conducted in the flowing water if working in the dry will likely cause additional degradation. Any work conducted in the flowing water must be for a short duration and with minimal impact, and conform to the Division-approved methodology.
16. All activities must be carried out in such a manner as will prevent violations of water quality criteria as stated in TDEC Rule Chapter 0400-40-03, or impairment of the uses of waters of the state as designated by Rule Chapter 0400-40-04.
17. Erosion prevention and sediment control measures must be in place and functional before any earth moving operations begin, and shall be designed according to the department's Erosion and Sediment Control Handbook (<http://tnepsc.org/handbook.asp>). Permanent vegetative stabilization using native species of all disturbed areas in or near the stream channel must be initiated within 14 days of project completion (see also Landscaping with Natives at tnepsc.org). Non-native, non-invasive annuals may be used as cover crops until native species can be established.
18. Temporary stream crossings shall be limited to one point in the construction area and erosion control measures shall be utilized where stream bank vegetation is disturbed. Stream beds shall not be used as


linear transportation routes for mechanized equipment, rather, the stream channel may be crossed perpendicularly with equipment provided no additional fill or excavation is necessary.

Obtaining Permit Coverage

Utility Line Crossing activities requiring written notification and authorization may obtain coverage by submitting a signed and completed application (form CN-1091), along with any other required information, to the division. Work shall not commence until a written Notice of Coverage (NOC) from the division is received. As noted above, not all activities may be eligible for coverage under this general permit and coverage may be denied when appropriate.

Each Notice of Coverage under this general permit is valid until the expiration date specified on the NOC. If the General Permit is modified, reissued, or revoked, and the permittee has commenced or is under contract to commence this activity before the expiration date, the permittee may have up to twelve (12) months from the date of the modification, reissuance, or revocation of the General Permit to complete the activity under the present terms and conditions of the general permit.

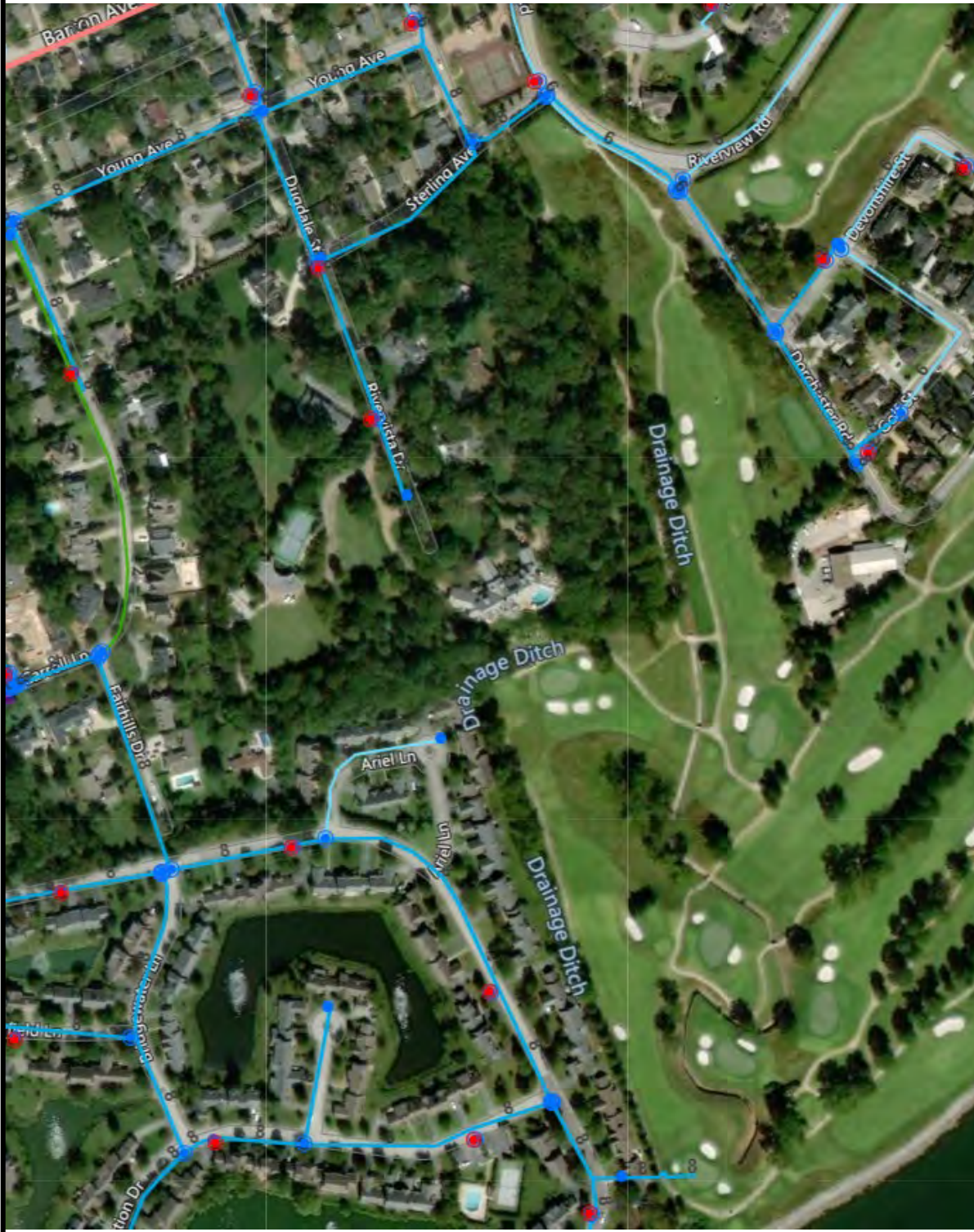
An application fee as established in Rule 0400-40-11-.02 will be assessed to applicants intending to receive an NOC to conduct activities under this general permit. An annual maintenance fee will be assessed to those individuals holding general permit coverage unless a Notice of Termination (NOT) form is received prior to the one-year anniversary of the issuance date of the NOC. An NOT form can be downloaded from the division's ARAP webpage (<https://www.tn.gov/environment/permit-permits/water-permits1/aquatic-resource-alteration-permit--arap-.html>).

APPROVED: 
Jennifer Dodd
Director, Division of Water Resources

DATE: 04/07/2020

APPENDIX D

TN AMERICAN WATER EXISTING WATER



"American Water Proprietary and Confidential"
"This map is property of American Water. It has been produced in accordance with a Non-Disclosure Agreement. Duplication of this map in whole or part is prohibited without the permission of American Water."
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Heritage Landing Dr Chattanooga, TN



APPENDIX E

CCTV CHARACTERIZATION SPREADSHEETS

