



**REQUEST FOR BID  
FOR  
Rodney Baber Park Sewer Improvements**

**Bid No. 179821.71.0402**

**May 5, 2016**



**City of Memphis, Tennessee**

Black & Veatch and Overland Contracting Inc. (OCI), a subsidiary of Black & Veatch, are the Program Manager and Construction Manager respectively, for the SARP10 Program for the City of Memphis.

Overland Contracting Inc.  
3485 Poplar Avenue, Suite 230, Memphis, TN, 38111

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## 00170 - Request for Bid

### 00170.1 Introduction

Sealed bids will be received at the Office of the City of Memphis Environmental Administration, Room 620, City Hall, 125 N. Main, Memphis, TN 38103, until **3:00 p.m. local time, May 19, 2016** for furnishing the City of Memphis with the following:

FOR THE DIVISION OF: PUBLIC WORKS FOR THE CONSTRUCTION OF:  
SARP10 Program **Rodney Baber Park Sewer Improvements**

**The Sealed Bid envelope must be labeled with the project name, bidder's name, license bidder number, license expiration date, license classification. The Sealed Bid envelope must contain one (1) hardcopy of the bid and one (1) electronic CD copy of the bid.**

Sealed Bids that are sent through the mail or other such delivery service shall be sent in such a manner so as to allow the opening of the "Mailing Container" and still have intact the sealed Bid. On the Mailing Container the sender shall state the words that a **"SEALED RESPONSE IS ENCLOSED"** and the Bid number.

Subcontractors intending to bid on this project must follow the instructions for Registration as stated in the Advertisement Legal Notice Request for Bid No. **179821.71.0402** (dated May 5, 2016). Registration information must be submitted by **May 16, 2016**.

### 00170.2 Program Overview

The Program consists of the management of the capital program needed to bring the City's wastewater and sewer system into compliance with federal and state regulations per the City of Memphis Wastewater Collection and Transmission System (WCTS) Condition Assessment and Rehabilitation Program Consent Decree signed on September 21, 2012, including the procurement of studies, design and construction services associated with the City of Memphis SARP10 Program.

### 00170.3 Scope of Work

The scope of work for this bid generally consists of installing approximately 2000 linear feet of new 12" diameter sanitary sewer pipe, approximately 480 linear feet of new 24" diameter fiberglass reinforced sanitary sewer, and new sanitary sewer manholes in and near Rodney Baber Park in Memphis, TN. Also included is the post construction assessment of all new pipes and manholes. The assessment includes manhole assessment as well as closed-circuit television (CCTV) inspections for all pipe diameters. The assessment will be done according to National Association of Sewer Service Companies (NASSCO) protocols. Other related work includes abandoning existing sanitary sewer pipes, bypass pumping, restoring the disturbed area, and erosion control.

### 00170.4 Bid Guarantee Requirements

Guarantee Requirements:

- (a) Bidder will not withdraw bid for one hundred eighty (180) calendar days after opening of bids without Purchaser's written consent.
- (b) If bid is accepted, bidder will enter into formal Subcontract with Purchaser, within five (5) calendar days after receipt of Subcontract documents for execution.
- (c) If bid is accepted, bidder will execute required 100% Performance/Payment Bond in accordance with Article 00571.4 and will obtain required insurance coverage in accordance with Article 00572.21 within ten (10) calendar days after receipt of Subcontract.
- (d) All bids will require a bidder's bond or certified or cashier's check made payable to the Purchaser on a solvent bank in the amount of 5% of the bid. Said instrument to remain in





effect and will be returned only after the Subcontract has been fully executed and secured. Additionally, the successful bidder shall execute a performance bond in an amount equal to 100% of the Subcontract sum as security for the faithful performance of the Subcontract and for the payment of labor and material furnished and incorporated into the Work. The only acceptable form of instrument for this bid bond is bound herein, Article 00672.7.

Bidder shall be liable to the Purchaser for full amount of proposal guarantee as representing damage to the Purchaser on account of default of bidder if:

- (a) Bid is withdrawn within one hundred eighty (180) calendar days after receipt of bids without approval by Purchaser.
- (b) Bidder fails to enter into contract with Purchaser and execute required Performance Bond and provide required insurance coverage within ten (10) calendar days subsequent to notice of award of the Subcontract.

**Firms desiring to submit a Bid should carefully review these instructions. Compliance with all requirements will be solely the responsibility of the Respondent.**

#### **00170.5 Request for Bid Definitions**

Terms used in this Request for Bid documents are defined and have the meanings assigned to them as follows. The term "OCI", "Purchaser" or "Program Manager" means Overland Contracting Inc. The term "Respondent", "Firm", "Company", "Subcontractor" or "Bidder" means one who submits a Response for the purpose stated in this Solicitation Request for Bid documents. The terms "BID", "Response" or "Respondent's Response" mean all submittal documents provided by the Respondent as required by this Request for Bid. The terms "Request for Bid" or "Bid Documents" mean the documents included in this Request for Bid.

Every effort has been made to use industry-accepted terminology in this Request for Bid. Any statement in this document, which uses words such as "must", "shall", "should", "provide for" or "have/provide the capability of/for", means that compliance with the intent of the statement is mandatory and that failure by the Respondent to satisfy that intent may be cause for the Response to be rejected.

#### **00170.6 Minority / Women Business Enterprise (M/WBE) Requirements**

This section shall set forth the respondent's M/WBE Participation Plan that must be submitted and include: (1) the level and dollar amount of participation your firm anticipates to achieve in the performance of the Subcontract resulting from this RFB; (2) the type of Work to be performed by the M/WBE firms participating; and (3) the names of the M/WBE firms the Respondent plans to utilize in the performance of the Subcontract resulting from this RFB.

SRF Fair Share Goals:

MBE goal - Construction 2.6%

WBE goal - Construction 2.6%

(Vendors from the TDOT TNUCP DBE list, other State or Federal DBE lists, or the City of Memphis EBO list)

SARP10 DBE Participation goal: 15%

(Vendors from the City of Memphis EBO list only)

#### **00170.7 Clarification of Bid**

Purchaser reserves the right to obtain clarification of any point in a Response or to obtain additional information as necessary to properly evaluate a particular Response. Failure to respond to such request for additional information or clarification in a timely manner may result in rejection of the Response.

#### **00170.8 Not Used**



### 00170.9 Responsiveness

Respondents should respond to all requirements of the Bid to the maximum extent possible and are required to clearly identify any limitations or exceptions to the requirements.

### 00170.10 Examination of Request for Bid Documents

Before submitting a Response, each Respondent must:

Study and carefully correlate the Respondent's observations and responses with the Bid Documents.

Notify Purchaser, of all conflicts, errors and discrepancies, if any, in the Bid Document submitted.

Review the Loss Control Manual and State Revolving Fund (SRF) Documents.

Respondents by and through the submission of their Response, agree that they shall be held responsible for having therefore familiarized themselves with the nature and extent of the requirements in the Bid Documents.

### 00170.11 Interpretations and Addenda

If any prospective Firm is in doubt as to the true meaning of any part of the Requirements For Preparing and Submitting Bid Submittal for the requested services, they may submit a written request (verbal requests will not be accepted) for an interpretation before the Last Date for Bidder Questions as stated in 00170.16. The person submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by addendum transmitted to each party receiving a set of such documents. Purchaser will not be responsible for any other explanations or interpretations of the proposed documents. Any requests not submitted within this time period will be deemed waived.

### SUBMIT ALL QUESTIONS BY E-MAIL TO:

Attn: Ginny Dorsey

[DorseyV@bv.com](mailto:DorseyV@bv.com)

Cc: Justin Avent

[justin\\_avent@gspnet.com](mailto:justin_avent@gspnet.com)

Cc: Brad Davis

[DavisBJ@bv.com](mailto:DavisBJ@bv.com)

(Reference: *SARP10 Program Rodney Baber Park Sewer Improvements, Bid No. 179821.71.0402*)

All requests or questions should be clearly marked and must be received by Last Date for Bidder Questions as stated in 00170.16.

A response will be returned via Addendum to all Firms along with the original question(s).

There shall be no communication between the Firm, their employees or subcontractors concerning this Bid to anyone within Black & Veatch, OCI, Allen & Hoshall, Allworld Project Management, Gresham Smith and Partners, Integrated Circles Technologies, Tamco, Carter-Malone Group, Rohadfox Construction Control Services Corporation, or City of Memphis employee or any such person's spouse, child, parent, brother, sister, dependent or person assuming a relationship being the substantially equivalent of the above except through Brad Davis. **Failure to comply with this requirement will be grounds for disqualification.**

### 00170.12 Modification or Withdrawal of Bid Submittals

Responses may be modified or withdrawn by an appropriate document duly executed (in the same manner that a Response must be executed) and delivered to the place where Responses are to be submitted at any time prior to the submission deadline. A request for withdrawal or a modification must be in writing and signed by an authorized person. Evidence of such authority must accompany the

request for withdrawal or modification. Withdrawal of a Response will not prejudice the rights of a Responder to submit a new Response prior to the Response deadline. After expiration of the period for receiving Responses, only Purchaser may request clarifications or additional information.

**00170.13 Rejection of Responses**

To the extent permitted by applicable local, state and federal laws and regulations, Purchaser reserves the right to reject any and all Responses, to waive any and all informalities not involving price, time, or changes in the Work with the successful Respondent, and the right to disregard all non-conforming, non-responsive, unbalanced or conditional Responses. Also, Purchaser reserves the right to reject a Response, in its sole discretion, if the City of Memphis believes that it would not be in its best interest to make an award to that Respondent.

Purchaser reserves the right to reject any Response if the evidence submitted by the Responder or if the investigation of such Respondent fails to satisfy Purchaser that such Respondent is properly qualified to carry out the obligations and to complete the Work contemplated therein. All Responses will be rejected if there is reason to believe that collusion exists among Respondents. Responses will be considered irregular and may be rejected if they show serious omissions, alterations in form, additions not called for, conditions or unauthorized alterations, or irregularities of any kind.

**00170.14 Other Items**

This Bid does not commit Purchaser to enter into a Subcontract, nor does it obligate Purchaser to pay for any costs incurred in the preparation and submission of Responses or in anticipation of a Subcontract. Costs of preparing the Bid in response to this request are solely the responsibility of the Respondent.

By responding to this solicitation, the respondent attests that no employee of Black & Veatch, OCI, Allen & Hoshall, Allworld Project Management, Gresham Smith and Partners, Integrated Circles Technologies, Carter-Malone Group, Rohadfox Construction Control Services Corporation, or City of Memphis employee or any such person's spouse, child, parent, brother, sister, dependent or person assuming a relationship being the substantially equivalent of the above, has an existing or pending, direct or indirect, financial interest in the respondent's business.

No Respondents to this solicitation shall discriminate against any employee or applicant for employment because of race, religion, color, sex, age, or national origin.

**00170.15 Selection Process**

Purchaser intends to select one Firm based on price and successful completion and approval of the OCI Registration process. There is a local contractor preference of 5%. For evaluation purposes the 5% will be applied to the Total Estimated Unit Price Value.

**00170.16 Selection Schedule**

The following schedule will be adhered to during the selection process. It is subject to change at the sole discretion of OCI.

<u>Event</u>	<u>Completed By</u>
Advertising Date	<b>May 5, 2016</b>
Pre-Bid Meeting	<b>May 12, 2016</b>
Registration Information submitted per 179821.71.0402 Advertisement	<b>May 16, 2016</b>
Last Date for Bidder Questions	<b>May 16, 2016</b>
Issue Addendum for answers to questions	<b>May 17, 2016</b>

<u>Event</u>	<u>Completed By</u>
Receive all Bids	<b>May 19, 2016</b> by 3:00PM local time
Public Opening	<b>May 19, 2016</b> immediately following receipt of bids
Public Notice of Intent to Award	<b>May 25, 2016</b>
Preconstruction Meeting with Subcontractor	<b>May 27, 2016</b>
Tentative Notice to Proceed	<b>May 31, 2016</b>

**00170.17 Mandatory Pre-Bid Meeting**

A mandatory pre-bid meeting will be held at **9:30 A.M. (local time)** at the **Benjamin Hooks Central Library 3030 Poplar Avenue Memphis, TN 38111** on **May 12, 2016**. Bidders are required to attend at their own cost.

## 00270 - Instructions to Bidders

### 00270.1 Bidder's Compliance with Request for Bid

Provide the information requested and any supporting information necessary to permit a complete analysis of your bid. You acknowledge that preparation and submission of a bid will be at your sole cost and that you will treat this RFB and any resulting discussions as confidential. If you do not agree to treat this RFB and associated discussions as confidential, return the complete RFB to Purchaser and delete or destroy any copies you made.

### 00270.2 General Bid Parameters

Provide the information requested in Section 00270 and Section 00370 in the appropriate fields of Section 00370. Complete each line of Section 00370 in its entirety and submit it with your bid in accordance with Section 00170. Do not alter Section 00370 forms in any way or deviate from the terminology used or the unit of measure indicated when completing Section 00370. Submit Section 00370 forms in their original core application software, with no embedded programming and no permissive encoding restricting access to the data provided.

#### 00270.2.1 Bidder's Contact Information

Include contact information for your representative in Article 00370.2.1. Your representative must have the appropriate expertise and authority to negotiate on behalf of your company.

#### 00270.2.2 Addenda to Request for Bid

In Article 00370.2.2, list all addenda received from Purchaser and indicate "Yes" to show your receipt of and incorporation of the listed addenda into the proposal. Address any exceptions or clarifications to addenda in accordance with Article 00270.6.

### 00270.3 Bid Pricing

You must include numerical values in the applicable fields of Tables 00370.3.1 through 00370.3.3. Non-numerical values, such as "included" or "not applicable," are not acceptable. Purchaser will evaluate fields left blank or filled with a zero as scope included in your bid at no cost.

#### 00270.3.1 Unit Pricing

Provide the unit prices to perform the Work in accordance with this RFB in Table 00370.3.1. A unit price is the total amount to be billed to Purchaser for a specific unit of work. Unit pricing includes all costs, overhead, profit and mark-up associated with delivering the complete unit.

### 00270.4 Supplemental Bid Information

#### 00270.4.1 Company Status

In Article 00370.4.1, indicate the type of your organization's legal entity and the state and country in which it is organized.

#### 00270.4.2 Contractor License

If you are not licensed to perform the Work, indicate "No" in Article 00370.4.2. If you indicate "No," declare an exception in accordance with Article 00270.6.

#### 00270.4.3 Not Used

#### 00270.4.4 Bid Validity Period

Indicate "Yes" in Article 00370.4.4 if your proposal is valid for one hundred eighty calendar days after the Proposal Due Date (the "Proposal Validity Period"). If you indicate "No" in Article 00370.4.4, provide the number of calendar days that your proposal is valid in Article 00370.4.4 and declare an exception in accordance with Article 00270.6. Purchaser may reject your proposal without prior notice if your proposal is not valid for the full Bid Validity Period.

#### **00270.4.5 Firm Non-Escalatable Pricing**

Indicate "Yes" in Article 00370.4.5 if the proposal pricing is firm and not subject to escalation. If you indicate "No," declare an exception in accordance with Article 00270.6 and include the terms of escalation in your exception.

#### **00270.4.6 Taxes**

Tax requirements are identified in Article 00571.6. Indicate "Included" in Article 00370.4.6 if your proposal includes the tax requirements. If you indicate "Excluded" in Article 00370.4.6, declare an exception in accordance with Article 00270.6.

#### **00270.4.7 Work at Jobsite**

Identify the type of craft labor. If you plan to subcontract any of the Work, indicate "Yes" in the appropriate section of Article 00370.4.7 and complete Table 00370.4.7.

#### **00270.5 Schedule Compliance**

Indicate "Yes" in Article 00370.5 if you can meet the schedule dates included in Table 00370.5. If you indicate "No," submit an alternative summary level schedule with your proposal.

#### **00270.6 Compliance with Request for Bid**

##### **00270.6.1 Declared Exceptions to RFB Requirements**

An exception is any variation from an express RFB requirement. Declare all exceptions, whether commercial or technical in nature, in Table 00370.6.1. Provide specific exceptions and accurately reference the article number to which each exception applies. Exceptions of a general nature or that refer to your standard specifications or terms are not acceptable and may result in Purchaser rejecting your bid without prior notice.

##### **00270.6.2 Declared Clarifications to RFB Requirements**

A clarification is the means by which you offer to meet an RFB requirement if the RFB does not identify the specific means by which the RFB requirement must be met. Declare any clarifications, whether commercial or technical in nature, in Table 00370.6.2. Reference the article number to which each clarification applies.

#### **00270.7 Bid Attachments**

List any supplemental documents included in your bid in Article 00370.7.

#### **00270.8 Declarations**

Indicate "Yes" in Article 00370.8 to confirm you have familiarized yourself with the conditions affecting the Work. If you indicate "No," declare an exception in accordance with Article 00270.6.

#### **00270.9 Nondiscrimination**

All entities contracting with the Purchaser agree to abide by and to take affirmative action when necessary to ensure compliance with the nondiscrimination clauses set out below, and agree to show proof of non-discrimination upon request and to post in conspicuous places available to all associate agents and their employees. In the event of non-compliance with nondiscrimination clauses, or with provisions of Executive Orders 11141 (age), 11246, 11375 (women), 12086 (Vietnam veterans), 11478 (federal employees), 11625 (minority business) 11701 (veterans), Title 41, Chapter 60 (handicapped) and specifically the handicapped affirmative action clause in Section 60-741.6.9 of OFCCP Rules, and any and all other federal laws prohibiting discrimination, contracts may be canceled, terminated, or suspended in whole or in part by the Purchaser.

The Bidder shall execute the specified Nondiscrimination Certificate (see Section 00672.3) agreeing that, if awarded the Subcontract, he/she shall not discriminate against any Sub-subcontractor, employee, or applicant for employment on the grounds of race, color, national origin or sex, in accordance with the citations listed in the above paragraph; and shall require the execution of such a certificate for each Sub-

subcontractor prior to award of any subcontract with the further requirement that each subcontractor shall include identical requirements in any lower tier subcontracts which might in turn be made. FAILURE TO EXECUTE AND SUBMIT SUCH CERTIFICATE WITH THE BID MAY CAUSE THE BID TO BE REJECTED AS NON-CONFORMING. The successful Bidder and all Sub-subcontractors under the general contract shall maintain copies of their payrolls and all subcontracts for each weekly payroll period for the life of the construction and for a period of **SEVEN (7) YEARS** after final release and payment is made by the Purchaser to the contractor.

**00270.10 Equal Business Opportunity Program (EBO)**

The Bidder must complete and return the Equal Business Opportunity Program Compliance Form included in Section 00672.4 of this RFB.

**00370 – Commercial Bid Form (11 pages)**





**00370 - Commercial Bid Form**

**Bidder should refer to Section 00270, Instructions to Bidders, when completing this Bid Form. Bidder shall complete this form entirely and return it with Bidder's Bid.**

00370.1 Bid Submitted by	Bidder Response Column
Company Name	
Mailing Address/Number, Street	
Mailing Address/State, Zip Code	
Country	
Taxpayer ID Number (or EIN)	
Bidder's Bid Date	
Bidder's Bid No.	

**00370.2 General Bid Parameters**  
**Bidder is providing the information defined by the articles comprising Section 00270, INSTRUCTIONS TO BIDDERS, in the corresponding fields of this Section 00370, COMMERCIAL BID FORM.**

00370.2.1 Bidder's Contact Information	Bidder Response Column
Bidder's Representative Name	
Title	
Mailing Address/Number, Street	
Mailing Address/City	
Mailing Address/State, Zip Code	
Delivery Address/Number, Street	
Delivery Address/State, Zip Code	
Country	
Email Address	
Phone Number	( ) - ( )
Mobile Phone Number	( ) - ( )
Fax Number	( ) - ( )

**Business Interruption Plan**  
 Confirm that Bidder maintains a Business Interruption/Disaster Recovery Plan that documents how Bidder will respond to disaster or pandemic to help minimize impact -**Yes/No**  
 If Yes, plan should be submitted with RFB.

00370.2.2 Addenda to Request for Bid			Bidder Response Column
Bidder acknowledges receipt and inclusion of the following Addenda to the RFB - Yes/No			Received and Incorporated
	Addenda Number	Date Issued	

**00370.3 Bid Pricing Information**  
**00370.3.1 Bid Prices**      **See Attached Pricing Table(s) [Bidder to List Tables Used]**

**00370.4 Supplemental Bid Information**  
 Bidder provides the following information to supplement the Bidder's bid pricing.

00370.4.1 Company Status	Bidder Response Column
Bidder's company status is: (i.e., partnership, individual owned, joint venture, corporation, etc.)	
in State of	
in Country of	

00370.4.2 Contractor License	Bidder Response Column
Bidder certifies that it is licensed, as required, to engage in the RFB Work scope in the State/Province/Country the RFB Work is to be performed. - <b>Yes/No</b>	
1st License Title	
in State/Province of	
License Number	
2nd License Title	
in State/Province of	
License Number	
00370.4.3 DUNs Number	

00370.4.4 Bid Validity Duration	Bidder Response Column
Bidder's bid is valid for acceptance by the Purchaser for a period of 180 days from the bid due date. - <b>Yes/No</b>	
If no, Bidder's bid is valid for indicated days from bid due date. - <b>Number of Days</b>	

00370.4.5 Firm Non-Escalatable Pricing	Bidder Response Column
All of Bidder's prices herein bid are firm and are non-escalatable. - <b>Yes/No</b> If No, explanation is included as an Exception.	

00370.4.6 Taxes	Bidder Response Column
Bidder's prices included herein are in accordance with Article 00571.6 Taxes. - <b>Yes/No</b> If No, explanation is included as an Exception.	

00370.4.7 Work at Jobsite	Bidder Response Column
Bidder's source of craft labor to be utilized in the performance of the Work is - <b>Open-Shop/Merit-shop/Union-shop</b>	
If applicable, identify the local union(s) used for hiring craft labor:      1st Local Union Name	
Address/Number, Street	
Address/City, State, Zip Code	
Phone	
Email	
2nd Local Union Name	
Address/Number, Street	
Address/City, State, Zip Code	
Phone	
Email	
Bidder has accounted for all Jobsite existing and controlling conditions and limitations which may affect the Work performance and the Bidder's Bid. - <b>Yes/No</b> If No, explanation is included in Exception.	
Bidder proposes that it will perform all the Work at the Jobsite with its own forces. - <b>Yes/No</b>	
Bidder has indicated proposed sub-subcontracted Work in attached Table 00370.4.7.- <b>Yes/No</b>	
Bidder has provided proposed Small Business/Minority/Disadvantaged Entrepreneur Participation Plan with its bid. - <b>Yes/No</b>	

00370.5 Schedule Compliance	Bidder Response Column
Bidder agrees to meet the schedule dates indicated in the RFB documents: - <b>Yes/No</b> If No, explanation is included in Exception.	
If No, Bidder has completed and submitted an attached alternative summary level schedule: - - <b>Yes/No</b>	

<b>00370.6 Compliance with Request for Bid</b>	
NOTE: A bid based on Bidder's standard terms and conditions will not be considered. The bid must address specific exceptions, if any, to Purchaser's terms and conditions.	
Bidder certifies that its bid complies with all RFB commercial and technical requirements without exception and clarification. - <b>Yes/No</b>	
<b>00370.6.1 Exceptions</b>	
Bidder certifies that its bid complies with all RFB commercial and technical requirements except for the following:	<b>Bidder Response Column</b>
Bid is based on acceptance of all commercial requirements of this RFB. - <b>Yes/No</b>	
If No, all Commercial Exceptions have been accurately defined and identified as "Commercial Exceptions" on the Purchaser provided and Bidder attached Exceptions Form. - <b>Yes/No</b>	
Bid is based on acceptance of all technical requirements of this RFB. - <b>Yes/No</b>	
If No, all Technical Exceptions have been accurately defined and identified as "Technical Exceptions" on the Purchaser provided and Bidder attached Exceptions Form. - <b>Yes/No</b>	
<b>00370.6.2 Clarifications</b>	
Bidder certifies that its bid complies with all RFB commercial and technical requirements without clarification. - <b>Yes/No</b>	<b>Bidder Response Column</b>
If No, all Commercial Clarifications have been accurately defined and identified as "Commercial Clarifications" on the Purchaser provided and Bidder attached Clarification Form. - <b>Yes/No</b>	
If No, all Technical Clarification have been accurately defined and identified as "Technical Clarifications" on the Purchaser provided and Bidder attached Clarification Form. - <b>Yes/No</b>	
<b>00370.7 Bid Attachments</b>	
In addition to this Commercial Bid Form and Tables indicated herein, the Bidder's Bid contains supplemental information and details attached to this bid consisting of the following:	<b>Bidder Response Column</b>
(Attachment 1)	
(Attachment 2)	
(Attachment 3)	
(Attachment 4)	
(Attachment 5) (Add additional lines as needed)	
<b>00370.8 Declarations</b>	
The Bidder declares that it has familiarized itself with the conditions affecting the Work. The Bidder also declares that only the persons or firms interested in the bid as principal or principals are named herein; that no other persons or firms have any interest in this bid or in the Subcontract to be entered into; that this bid is made without connection with any person, company, or party likewise submitting a bid; and that it is in all respects for and in good faith, without collusion or fraud. - <b>Yes/No</b>	
If written notice of acceptance of this bid is delivered to the Bidder within "Bid Validity" days after the date set for receipt of bid, or any time thereafter before the bid validity expires, the Bidder will, within 5 days after receipt of a formal Subcontract for signature, exercise and deliver to Purchaser a signed Subcontract in the form provided by the Purchaser in accordance with the documents provided herein. - <b>Yes/No</b>	

**Table 00370.3.1 - Unit Price Bid Form**

<b>Bidder should refer to Section 00270, Instructions to Bidders, when completing this Bid Form. Bidder</b>					
<b>Bid Submitted by</b> (Company Name)					
<b>00370.3 Bid Pricing Information</b>					
<b>00370.3.1 Unit Pricing</b>					
Bidder proposes to complete the RFB Work based on firm, fixed, unit prices (US dollars), which prices multiplied by the final Work quantities would represent the full consideration to Bidder for its complete and satisfactory performance of the Work in compliance with all the terms and conditions of the RFB Documents. The Unit Prices in this Table include the cost of all the work which is required or implied by the RFB documents or which may be inferred therefrom, and which is customarily provided in furnishing a complete and finished work item of its kind. Further, any and all alterations, modifications, and adjustments to the work item, which is reasonably foreseeable or customarily encountered in providing and installing equipment, material, and services of the work item kind, will be performed without additional compensation.					
In the event of a Purchaser-approved change in the scope of Work for which a unit price from this Table is not applicable, as determined by the Purchaser, the Subcontractor shall provide a new unit price for review and acceptance by the Purchaser. Subcontractor shall provide all information requested by the Purchaser to substantiate the value of the new unit price.					
<b>00370.3.1.1 Unit Prices</b>				<b>Bidder Response</b>	
<b>Item Number</b>	<b>Item Description</b>	<b>Unit of Measure</b>	<b>Estimated Quantity</b>	<b>Unit Price</b>	<b>Extension Price</b>
<b>Miscellaneous</b>					
00001	Mobilization	LS	1	\$ -	\$ -
<b>MACP</b>					
00001-6.01	Post GPS Coordinates of Each Manhole Cover	EA	14	\$ -	\$ -
00001-6.03	Post MACP Level 2 Manhole Inspection	EA	14	\$ -	\$ -
<b>PACP</b>					
00003-6.01.12	Post Light Cleaning & Mainline CCTV Inspection for 12 inch Pipe	LF	1980	\$ -	\$ -
00003-6.01.24	Post Light Cleaning & Mainline CCTV Inspection for 24 inch Pipe	LF	480	\$ -	\$ -
<b>Sewer Pipe Installation</b>					
02530-6.01	Site Preparation and Restoration	LS	1	\$ -	\$ -
02530-6.02	Undercut Backfill	Ton	728	\$ -	\$ -
02530-6.07.06.12.01	12 inch Ductile Iron Pipe, Class 50, 14-20 feet deep	LF	280	\$ -	\$ -
02530-6.07.15.12.01	12 inch Polyvinyl Chloride (PVC) Pipe, 6-10 feet deep	LF	880	\$ -	\$ -
02530-6.07.15.12.02	12 inch Polyvinyl Chloride (PVC) Pipe, 10-14 feet deep	LF	820	\$ -	\$ -
02530-6.07.16.24.01	24 inch Glass Fiber Reinforced Polymer Mortar Pipe, 22-26 feet deep	LF	210	\$ -	\$ -
02530-6.07.16.24.02	24 inch Glass Fiber Reinforced Polymer Mortar Pipe, 26-30 feet deep	LF	170	\$ -	\$ -
02530-6.07.16.24.03	24 inch Glass Fiber Reinforced Polymer Mortar Pipe, 30-34 feet deep	LF	110	\$ -	\$ -
02530-6.11.01	Service Connections	LF	50	\$ -	\$ -
<b>Installation and Replacement of Manoles</b>					
02531-6.01	Manhole Site Preparation and Restoration	LS	1	\$ -	\$ -
02531-03	Core and Boot Existing Precast Manhole	EA	1	\$ -	\$ -
02531-6.03.04	4' Diameter Precast Manhole Installation	VF	150	\$ -	\$ -
02531-6.03.06	6' Diameter Precast Manhole Installation	VF	35	\$ -	\$ -
03310-01	Reinforced Concrete Junction Box (Dog House Manhole)	EA	1	\$ -	\$ -
02531-6.05	Traffic Control	EA	14	\$ -	\$ -
02531-6.08	Vent Stack	EA	2	\$ -	\$ -
02531-6.09	Inside Drop Construction in Existing / New Manhole	VF	17	\$ -	\$ -
02531.6.09.01	NO. 7 Sewer Manhole Rim & Cover	EA	8	\$ -	\$ -

Item Number	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Extension Price
02531.6.09.02	Sewer Manhole Water Tight Rim & Cover	EA	3	\$ -	\$ -
02531.6.09.03	Sealed Manhole for Vent Stack	EA	2	\$ -	\$ -
<b>Pavement and Incidentals</b>					
02920-5.01.01	Asphaltic Concrete Pavement Removal and Replacement	SY	5	\$ -	\$ -
02920-5.01.02	Concrete Pavement Removal and Replacement	SY	2	\$ -	\$ -
02950-5.01.05	Gravel Driveway and Gravel Area Removal and Replacement with Crushed Stone	Ton	10	\$ -	\$ -
02530-02	Silt Fence	LF	4500	\$ -	\$ -
	100% Performance and Payment Bonds	Lot	1	\$ -	\$ -
<b>Total Estimated Unit Price Value</b>					\$ -

**Table 00370.4.7 - Sub-Subcontracts**

Bidder should refer to Section 00270, Instructions to Bidders, when completing this Table.					
Bid Submitted by (Company Name)					
00370.4.7 Sub-Subcontracts					
Bidder proposes that specific portions of the Work scope not performed by Bidder will be Sub-Subcontracted to the Sub-subcontractors indicated below. The value of each Sub-subcontract is indicated as an approximate percentage value of the total monetary value of the Bidder's Bid.					
Subcontractor must obtain a safety prequalification for any Sub-subcontractor that will be performing any portion of the Work at the Jobsite, prior to their arrival at the Jobsite. Refer to the "Subcontracting" article within the terms and conditions for applicable submission information.					
00370.4.7.1 Sub-Subcontracted Work					
Scope of Sub-Subcontracted Work	Sub-subcontractors (Name and Address)	MBE or WBE	% of Total Work Value	Safety Information Included (Y/N)	Current EMR
% of Work performed by Bidder	(Bidder Company Name)		100.0%		
(a)					
(b)					
(c)					
(d)					
(e)					
(f)					
(g)					
<b>Total Percentage Value (Must Equal 100%)</b>			<b>100.0%</b>		

**Table 00370.6.1 - Exceptions Form**

**Bidder should refer to Section 00270, Instructions to Bidders, when completing this Form.**

**Bid Submitted by** (Company Name)

**00370.6.1 Exceptions**

The Bidder's specific Exceptions herein itemized and included with the bid represent an exhaustive list of any and all explicit variations or deviations from the requirements of the RFB documents. Bidder confirms that otherwise, it is the intent of Bidder's bid that the Work will be performed in strict accordance with the requirements of the RFB documents.

**00370.6.1.1 Commercial Exceptions**

Count	Reference Article	Stated Commercial Exception
CE1		
CE2		
CE3		
CE4		
CE5		
CE6		
CE7		
CE8		
CE9		

**00370.6.1.2 Technical Exceptions**

Count	Reference	Stated Technical Exceptions
TE1		
TE2		
TE3		
TE4		
TE5		
TE6		
TE7		
TE8		
TE9		
TE10		
TE11		
TE12		
TE13		
TE14		
TE15		
TE16		
TE17		
TE18		
TE19		
TE20		

**Table 00370.6.2 - Clarifications Form**

**Bidder should refer to Section 00270, Instructions to Bidders, when completing this Form.**

**Bid Submitted by** (Company Name)

**00370.6.2 Clarifications**

All of Bidder's Clarifications herein itemized and included with the bid **do not** constitute explicit variation or deviation from performance of the Work by the Bidder in strict accordance with the requirements of RFB documents.

**00370.6.2.1 Commercial Clarifications**

Count	Reference Article	Stated Commercial Clarification
CC1		
CC2		
CC3		
CC4		
CC5		
CC6		
CC7		
CC8		
CC9		

**00370.6.2.2 Technical Clarifications**

Count	Reference	Stated Technical Clarification
TC1		
TC2		
TC3		
TC4		
TC5		
TC6		
TC7		
TC8		
TC9		
TC10		
TC11		
TC12		
TC13		
TC14		
TC15		
TC16		
TC17		
TC18		
TC19		
TC20		



**00370.7 Schedule Compliance**  
State any exceptions in 00370.6.1.

**00370.7.1 Construction Milestone Completion Dates**

Item	Milestone Description	Construction Milestone Completion Date	*LDs Apply ?	Bidder Complies? (Yes/No)
1	Completion of work as described in the Notice to Proceed	120 days after receiving the Notice to Proceed from Purchaser	Yes	

\*LD indicates that completion of the Work after the "Construction Milestone Completion Date" is subject to liquidated damages per applicable Articles of Section 00571.

\*Note\* Subcontractor performance will directly impact future procurements for the SARP10 Program. Schedule is critical and must be maintained.

00370.8 Schedule of Submittals							Bidder Agrees? Yes/No
Effective Date: <b>TBD</b>							
The following are post-award Subcontract submittals. This list is not all-inclusive. The RFB documents contain submittal requirements that are not included in this list. It will, however, remain the successful Bidder's responsibility to comply with submittal requirements whether or not the submittal is included in the following list:							
If Bidder does not agree, state an exception in 00370.6.1.							
Item	Reference Section	Submittal Item	Submittal Dates			Due Date	
			Calendar	Event			
<b>00370.8.1 Commercial Submittals</b>							
C01	None	Executed Subcontract in the form provided by the Purchaser	5	After	Receipt of Subcontract for Signature		
C02	00571	Payment Estimate Breakdown	10	After	Effective Date and Prior to First Payment with monthly updates		
C03	00571	Security Instruments	10	After	Effective Date		
C04	00572	Lien Waivers and Report of Disadvantaged Business Enterprise Participation Form		With	Each Invoice		
C05	00572	Final Lien Waivers from Subcontractor and Sub-subcontractors and Report of Disadvantaged Business Enterprise Participation Form		With	Final Invoice		
C06	00571	Final Payment Invoice and Report of Disadvantaged Business Enterprise Participation Form	45	After	Issuance of the Notice Of Final Completion and Acceptance		
C07	00572	Contractor Licenses	14	Before	Mobilization Onsite		
C08	00572	Written Notice and Supporting Documentation, of all Claims	5	After	Occurrence of Event Giving Rise to the		
C09	00572	Insurance Certificates for Purchaser Approval		Prior to	Mobilization		
C10	00572	Initial Issue Subcontractor's Work Execution Schedule	30	After	Effective Date		
C11	00571	Subcontractor Actual Man-hours Expended and Quantities Installed	Weekly	After	Mobilization Onsite		
C12	00575	Subcontractor's Daily Report	Daily	After	Mobilization Onsite		
C13	00575	Signed Daily Reports		Daily	After Mobilization Onsite		
C14	00575	Weekly Coordination Meeting Agenda Input	Weekly	Prior to	Weekly Coordination Meeting		
C15	00575	Subcontractor's Safety, Health and Accident Prevention Program		Prior to	Mobilization Onsite		
C16	00575	Subcontractor's Hazardous Waste Project Health and Safety Plan		Prior to	Mobilization Onsite		
C17	00575	Safety and Health Representative Resume		Prior to	Assignment and Mobilization		
C18	00575	Verification of meeting Hazardous Waste Requirements of 29CFR1910.120	5	Prior to	Mobilization Onsite		
C19	00575	Hazardous Materials Documentation		With	Each Hazmat Shipment		
C20	00575	Safety and Health Records	Monthly	After	Mobilization Onsite		
C21	00575	Evidence that Jobsite Personnel have Passed Drug Testing	10	Prior to	Mobilization Onsite		
C22	LCM	Fall Protection Plan	5	Prior to	Starting Work Operations		
C23	LCM	Chemical Hazard Communication Plan, as applicable	5	Prior to	Mobilization Onsite		
C24	LCM	Substance Abuse Program	5	Prior to	Mobilization Onsite		
C25	SRF	W-9 of Subcontractor and Sub-subcontractors - also include Contact Information for each, including email, phone number, and address		With	Bid		

00370.8 Schedule of Submittals							
Effective Date: <b>TBD</b>							
The following are post-award Subcontract submittals. This list is not all-inclusive. The RFB documents contain submittal requirements that are not included in this list. It will, however, remain the successful Bidder's responsibility to comply with submittal requirements whether or not the submittal is included in the following list:							
If Bidder does not agree, state an exception in 00370.6.1.							
Item	Reference Section	Submittal Item	Submittal Dates			Bidder Agrees? Yes/No	
			Calendar	Event	Due Date		
C26	00672.3	Certificate of Nondiscrimination for Subcontractor and Sub-subcontractors		With	Bid		
C27	00672.4	Equal Business Opportunity Program Compliance Form for Subcontractor and Sub-subcontractors		With	Bid		
C28	00672.6	Certification Regarding Debarment Subcontractor and Sub-subcontractors		With	Bid		
C29	00672.6	Certification Regarding Equal Employment Opportunity for Subcontractor and Sub-subcontractors		With	Bid		
C30	SRF	M/WBE Certificates for both Subcontractor and Sub-subcontractors as applicable		With	Bid		
C31	00170.4	Bid Bond		With	Bid		
C35	SRF	Employee Rights under the Davis-Bacon Act Poster (English and Spanish)		Posted	All Sites to be easily accessed/viewed and protected from weather		
C36	SRF	WH-1321 poster		Posted	All Sites to be easily accessed/viewed and protected from weather		
C37	SRF	Wage Decision		Posted	All Sites to be easily accessed/viewed and protected from weather		

## 00571 - Supplementary Terms and Conditions

### 00571.1 Notices and Correspondence

The parties agree to send all notices arising out of or related to this Subcontract by one of the following methods: (a) personal delivery; (b) certified mail with return receipt; (c) nationally recognized overnight mail or courier service, with delivery receipt requested; or (d) email. The parties may send routine correspondence by email or first class mail, each without confirmation of receipt. The parties agree to address notices and correspondence as indicated in this article. Subcontractor agrees that delivery of a notice or of correspondence by Purchaser to Subcontractor's at the jobsite constitutes personal delivery.

#### Electronic Technical Correspondence

**Addressed to Purchaser:**

To: Brad Davis  
[DavisBJ@bv.com](mailto:DavisBJ@bv.com)  
Cc: Gary Older  
[OlderGS@bv.com](mailto:OlderGS@bv.com)

**Addressed to Subcontractor:**

To: [[ name ]]  
[[ email address ]]  
Cc: [[ name ]]  
[[ email address ]]

#### Non-Electronic Technical Correspondence

**Addressed to Purchaser:**

Overland Contracting Inc.  
3485 Poplar Avenue, Suite 230  
Memphis, TN 38111  
Attention: Brad Davis  
179821.71.0402

**Addressed to Subcontractor:**

[[ subcontractor entity ]]  
[[ street address ]]  
[[ city, state, zip code ]]  
Attention: [[ name ]]  
179821.71.0402

#### Electronic Commercial Correspondence (excluding invoices)

**Addressed to Purchaser:**

To: Ginny Dorsey  
[Dorsey@bv.com](mailto:Dorsey@bv.com)

**Addressed to Subcontractor:**

To: [[ name ]]  
[[ email address ]]  
Cc: [[ name ]]  
[[ email address ]]

#### Non-Electronic Commercial Correspondence (excluding invoices)

**Addressed to Purchaser:**

Overland Contracting Inc.  
8400 Ward Parkway  
Kansas City, MO 64114  
Attention: Ginny Dorsey  
179821.71.0402

**Addressed to Subcontractor:**

[[ subcontractor entity ]]  
[[ street address ]]  
[[ city, state, zip code ]]  
Attention:  
179821.71.0402

### Electronic Invoices

Prior to Invoice submission to [BVAPMarkView@bv.com](mailto:BVAPMarkView@bv.com), Subcontractor will send a copy to [OlderGS@bv.com](mailto:OlderGS@bv.com), [DavisBJ@bv.com](mailto:DavisBJ@bv.com) and [RoachJ@bv.com](mailto:RoachJ@bv.com) for review and approval. Once Jacob Roach receives Project Manager approval, he will notify the Subcontractor to submit the Invoice to [BVAPMarkView@bv.com](mailto:BVAPMarkView@bv.com). Subcontractor shall utilize the A1A form, available upon request.

#### Original Invoice:

To: Overland Contracting Inc.

[BVAPMarkView@bv.com](mailto:BVAPMarkView@bv.com)

Fax (866) 941-9458

Attention: BVAP

179821.71.0402

#### With a Copy to:

To: Jacob Roach

[RoachJ@bv.com](mailto:RoachJ@bv.com)

### 00571.2 Not Used

#### 00571.3 Payment Terms

The following payment terms shall apply in addition to the corresponding provisions contained in Article 00572.4 Invoicing and Payment.

The Parties will meet each month at an agreed time in order to determine the quantity of materials used and man-hours expended during the invoice period. The Parties will use the field progress measurement system to calculate that month's payment total by adding the Subcontract unit price totals based on actual Work completed.

#### 00571.4 Security Instruments

Subcontractor shall give Purchaser separate performance and payment bonds in the format of AIA Document 312 - 2010 Performance Bond and Payment Bond, each in the amount of the Subcontract Price. Subcontractor shall submit the bonds to Purchaser by the due date specified in the Article titled "Schedule of Submittals and Applicable Liquidated Damages". The bonding company must be licensed to bond in the state in which the Project is located and must be rated "A" or better by A.M. Best and included in the Department of the Treasury's Listing of Approved Sureties (Department Circular 570).

### 00571.5 Liquidated Damages

#### 00571.5.1 General

Subcontractor's failure to meet the requirements identified in this Article 00571.5 will cause Purchaser to incur harm that will be very difficult to ascertain with certainty. The Parties therefore agree the liquidated damages specified in this Article 00571.5 represent a reasonable estimate of Purchaser's harm and are not intended as a penalty. Subcontractor's obligation to pay liquidated damages for breach of one specified requirement does not relieve Subcontractor of its obligation to pay liquidated damages for breach of another specified requirement. Subcontractor's payment of liquidated damages for breach of the specified requirement is Purchaser's sole and exclusive remedy with regard to Subcontractor's breach of that requirement, except for any other express remedies stated in the Subcontract. If Purchaser terminates the Subcontract for cause, liquidated damages will cease to accrue after the termination date and Subcontractor's remaining liability will be calculated in accordance with Article 00572.17.

#### 00571.5.2 Not Used

#### 00571.5.3 Construction Milestone Dates

Each construction milestone subject to liquidated damages for late completion is listed in the article titled "Construction Milestone Completion Dates and Applicable Liquidated Damages". If all portions of the

Work comprising the construction milestone do not meet the Subcontract requirements on the construction milestone completion date, liquidated damages will accrue for each failure as shown below.

Beginning on the first calendar day after the specified construction milestone completion date for each construction milestone and continuing until the construction milestone is completed, delay liquidated damages will be assessed at the rate of five hundred (\$500) dollars per calendar day.

#### **00571.6 Taxes**

Subcontractor shall pay all payroll and other related employment compensation taxes for Subcontractor's employees, federal, state and other taxes which may be assessed on Subcontractor's income from the Project, engineering and business license costs (collectively, the "Subcontractor Taxes"). Subcontractor shall administer and pay all sales, use, gross receipts and excise taxes (collectively, the "Project Taxes"). Subcontract price includes Subcontractor Taxes and all Project Taxes. Purchaser will not be responsible for any additional charges related to tax that were not included as part of the Subcontract Price. Where applicable, Purchaser shall furnish to Subcontractor a certificate complying with state and local governmental laws, regulations and ordinances identifying any components of the Work to be considered exempt from the Project Taxes. Subcontractor shall cooperate with Purchaser to establish appropriate procedures and minimize the amount of such taxes to the extent reasonable and practical. Subcontractor is responsible for all property taxes on the construction equipment; Owner is responsible for property taxes on all other items incorporated into the project. Subcontractor shall notify Purchaser, and Purchaser shall have the right to review prior to Subcontractor's response to such document, of any correspondence with a federal or local taxing authority as it relates to sales and use, gross receipts, or excise taxes.

## 00572 - General Terms and Conditions

### 00572.1 Definitions

The terms below have the following definitions when used in this Subcontract:

"Applicable Laws" means all laws, statutes, regulations, codes, rules, treaties, ordinances, judgments, permits, decrees, approvals, interpretations, injunctions, writs, orders, or other legal requirements of a governmental body entitled to exercise any administrative, executive, judicial, legislative, police, regulatory or taxing power and having jurisdiction over the jobsite or performance of the Work.

"Claims" means claims, actions, suits, liabilities, demands, damages, losses, costs, expenses (including reasonable attorneys' fees), impacts to price, impacts to schedule, awards, fines and judgments, of every kind and nature.

"Consent Decree" means the negotiated plan between Owner, Department of Justice, Environmental Protection Agency, Tennessee department of Environment and Conservation, and the Tennessee Clean Water Network that requires Owner to develop and implement plans to improve its wastewater systems.

"Final Completion" means: (a) the Work is complete and complies with the requirements of this Subcontract; and (b) Subcontractor has fulfilled all of its obligations under this Subcontract except obligations that survive completion of the Work.

"Indemnified Parties" means Owner and its officials, Purchaser, Purchaser's engineer, and the parent companies, related companies, affiliated companies, subsidiaries, successors, and assigns of each, including the shareholders, officers, directors, partners, employees, and agents of each of the above firms. "Indemnified Parties" does not include Subcontractor or any Sub-subcontractor.

"Notice to Proceed" means to written notice provided by Purchaser to Subcontractor releasing Subcontractor to proceed with all or part of the Work.

"Owner" means the City of Memphis, Tennessee.

"Program Manager" means Black & Veatch Corporation or Overland Contracting Inc. (OCI).

"Purchaser" means the party so identified in the Subcontract Agreement.

"SARP10 Program Office" 3485 Poplar Avenue, Suite 230, Memphis, TN 38111.

"Subcontract" means the agreement between Purchaser and Subcontractor consisting of: (a) the Subcontract Agreement; (b) the documents listed in the Subcontract Agreement; (c) written Subcontract revisions; (d) attachments, appendices and exhibits to the Subcontract documents; (e) documents expressly incorporated by reference into the Subcontract; and (e) any requirements that can be reasonably inferred from any of the foregoing.

"Subcontract Agreement" means the Subcontract form executed by Purchaser and Subcontractor.

"Subcontractor" means the party so identified in the Subcontract Agreement.

"Sub-subcontractor" means any party, at any tier, having an agreement with Subcontractor or with a Sub-subcontractor, to perform a portion of the Work.

"Work" means that which Subcontractor is to perform or provide under this Subcontract.

## 00572.2 Interpretation

00572.2.1 This Subcontract is the complete and final agreement between the parties relating to the Work. All prior or contemporaneous negotiations and agreements relating to the Work are superseded by this Subcontract. Exceptions or terms submitted by Subcontractor in the course of accepting this Subcontract are void.

00572.2.2 Provisions of this Subcontract that contemplate performance or obligations subsequent to completion or termination of the Work or contain waivers or limitations of liability will survive such completion or termination. Termination of the Work will not affect the rights and obligations that arose before termination.

00572.2.3 If any provision of this Subcontract is held to be unenforceable, the remaining provisions of this Subcontract will remain in effect.

## 00572.3 Subcontractor's Status

Subcontractor is an independent contractor in the performance of the Work. Subcontractor is solely responsible for the means, methods, sequences, procedures, and safety precautions used or adopted by Subcontractor and any Sub-subcontractor in the performance of the Work. Except as provided in Article 00574.2 and 00574.3, Subcontractor has sole authority and responsibility to employ, manage, discharge, and otherwise control its employees.

## 00572.4 Invoicing and Payment

00572.4.1 Subcontractor shall submit invoices to Purchaser with all documentation required to be submitted with the invoice. Each invoice must be itemized by the Subcontract line number. Each invoice must also clearly show the Subcontract number, the invoice number, the billing period (if applicable), the invoiced amount, retention (if applicable), and the net amount due. The final invoice must contain a copy of Purchaser's notice of Final Completion.

00572.4.2 Subcontractor agrees to provide additional itemization of the Subcontract price as Purchaser reasonably requests. If payment to Subcontractor will be on a time and material basis or a unit price basis, or if Subcontractor files a Claim under Article 00572.13, Subcontractor shall furnish Purchaser complete breakdowns and supporting information in the detail required by Purchaser to verify the accuracy of the invoiced or claimed amounts. Purchaser or Purchaser's designee may audit the aforementioned records at Purchaser's expense.

00572.4.3 Purchaser will withhold five percent retention from all invoices except the final invoice. Payment by Purchaser does not: (a) constitute approval or acceptance of any portion of the Work; (b) waive any of Purchaser's rights; or (c) relieve Subcontractor from responsibility or liability arising out of or related to this Subcontract. Acceptance by Subcontractor of final payment constitutes a release and waiver of all Claims by Subcontractor against Indemnified Parties.

00572.4.4 Purchaser may withhold or set-off amounts due under this Subcontract on account of Claims arising out of or related to Subcontractor's breach or reasonably anticipated breach of this Subcontract.

00572.4.5 Once Work that has undergone specified QA/QC is submitted, reviewed and approved by the Program Manager, the Subcontractor's invoice will be submitted along with the Program Manager's next invoice to the Owner. The Program Manager's invoice is typically submitted during the second week of each month for work performed during the previous month. Typical payment from the Owner to the Program Manager is anticipated to be forty five (45) calendar days upon Owner's acceptance of invoice, and the Program Manager will cause the Purchaser to pay the Service Contractor within two weeks of Program Manager's receipt of payment from the Owner.



### **00572.5 Schedule**

Performance of the Work as scheduled under this Subcontract is of the essence. Subcontractor shall give Purchaser written notice of any delay or anticipated delay within three calendar days after the occurrence of the event giving rise to the delay. Subcontractor's notice must identify the cause of the delay or the anticipated delay and the actions Subcontractor is undertaking to recover from or avoid the delay.

### **00572.6 Waivers of Lien**

As a condition precedent to payment, Subcontractor shall furnish a lien waiver in the form of Article 00672.1 with each invoice except the final invoice. As a condition precedent to payment of the final invoice, Subcontractor shall furnish a lien waiver in the form of Article 00672.2 with the final invoice. If a lien is filed and Subcontractor does not remove or bond around the lien within seven calendar days after receipt of written notice from Purchaser or Owner, Purchaser or Owner may remove the lien. Subcontractor shall reimburse Purchaser or Owner, as applicable, for all costs and expenses incurred by Purchaser or Owner in removing the lien, including reasonable attorneys' fees and court costs.

### **00572.7 Assignment and Subcontracting**

00572.7.1 Subcontractor may not assign all or part of this Subcontract voluntarily, by operation of law, or otherwise, nor may Subcontractor assign any of the money payable under this Subcontract, without obtaining Purchaser's prior written consent.

00572.7.2 Except for the supply of expendable materials and minor components or the supply of a portion of the Work for which a Sub-subcontractor is named in this Subcontract, Subcontractor may not subcontract the Work without first obtaining Purchaser's written consent. In addition, Subcontractor must obtain a safety prequalification for any Sub-subcontractor that will be performing any portion of the Work at the Jobsite, as outlined in Article 00575.9. If Subcontractor subcontracts any portion of the Work, Subcontractor remains responsible for complying with the Subcontract requirements and is liable to Purchaser for the acts and omissions of Sub-subcontractors, including their failure to comply with the requirements of this Subcontract or fulfill the obligations imposed on Subcontractor by this Subcontract, as if the acts and omissions were those of Subcontractor. Purchaser has the right to contact Sub-subcontractors to discuss their progress of the Work.

### **00572.8 Passage of Title, Risk of Loss, and Delivery**

Subcontractor warrants that the Work (excluding Subcontractor-furnished items that are not intended to become a permanent part of the project) will be free of all liens, claims, charges, security interests, encumbrances or defects in title. Title to the Work (excluding Subcontractor-furnished items that are not intended to become a permanent part of the project) will pass to Purchaser upon the earlier of Subcontractor's receipt of payment or delivery of the Work to the jobsite. Subcontractor retains the risk of loss of the Work until Purchaser issues the notice of Final Completion. The terms of delivery have the meanings assigned them in the 2010 edition of the Incoterms published by the International Chamber of Commerce, except as modified in this Subcontract.

### **00572.9 Final Completion**

Subcontractor shall notify Purchaser in writing when Subcontractor believes the Work meets the requirements for Final Completion. Purchaser will inspect the Work within ten calendar days after Purchaser's receipt of Subcontractor's notice. If Purchaser identifies any defective or non-conforming Work, Subcontractor shall correct that Work in accordance with Article 00572.10. Purchaser will issue a notice that Final Completion has been achieved when the Work meets the requirements for Final Completion. Purchaser's issuance of the notice of Final Completion does not relieve Subcontractor of its obligations under this Subcontract.

## 00572.10 Warranty

00572.10.1 Subcontractor warrants to Purchaser and Owner that the Work: (a) will be new when delivered to the jobsite; (b) will be free from defects in design, material, and workmanship; (c) will comply with Applicable Laws; (d) will comply with the requirements of this Subcontract; and (e) will be fit for the purposes specified. Subcontractor also warrants to Purchaser and Owner that elements of the Work for which this Subcontract does not establish express standards of quality and fitness will comply with good industry practices for the specific application. Subcontractor agrees that Owner may directly enforce the warranties of this Article 00572.10.1.

00572.10.2 Subcontractor shall correct any breach of this warranty within five calendar days after Purchaser gives Subcontractor written notice of the breach. The cost of warranty work and removal or replacement of other work will be at Subcontractor's expense. Subcontractor shall work diligently and without interruption to correct the breach. In the case of emergency where, in the reasonable judgment of Purchaser, delay could result in serious loss or damage to persons or property, Purchaser may correct the defect or nonconformity at Subcontractor's expense.

00572.10.3 The warranty for the Work extends until one year after Final Completion. The warranty applies to all repairs and replacements to the same extent the warranty applies to the original Work. The warranty period for repaired Work or replacements will be extended for a period of one year after the repair or replacement is complete or until the original warranty period expires, whichever occurs later.

00572.10.4 This project is being implemented to provide services to the City of Memphis, through the City's Program Manager, for implementation of the Consent Decree executed on September 20, 2012, civil action number 2:10-cv-02083-SHM-dkv (CD). The City negotiated the Consent Decree with the United States Environmental Protection Agency and the Tennessee Department of Environment and Conservation to implement an assessment and rehabilitation program of the City's wastewater collection and transmission system. Per section II, paragraph 5 of the Consent Decree, all contractors performing work required by the Consent Decree must be notified by the City that a copy of the Consent Decree is posted on the City's webpage. This article provides the required notification. The Consent Decree may be reviewed by accessing the City's webpage at:

<http://www.memphistn.gov/Government/PublicWorks/ConsentDecree.aspx>

This page provides a link to the Consent Decree and associated documents. An explanation of each document is also provided. Click on any link to access. Alternatively, the Consent Decree is available at: <http://www.sarp10.com/consent-decree/>

Subcontractor acknowledges that Owner's failure to achieve 100 percent compliance with the Consent Decree requirements may result in the imposition of penalties, costs, and other damages imposed against the Owner and Purchaser. To the extent caused by Subcontractor's failure to perform the Work in accordance with this Subcontract or to the extent caused by the negligence of Subcontractor or any Sub-subcontractor. Subcontractor agrees to pay penalties and costs incurred by Owner and Purchaser under the Consent Decree.

## 00572.11 Compliance with Laws

00572.11.1 Subcontractor shall comply with all Applicable Laws in effect during its performance of Work, including but not limited to the City of Memphis Prevailing Wage Ordinance, Davis Bacon, the Fair Labor Standards Act, Occupational Safety and Health Administration (OSHA), and the Americans with Disabilities Act (ADA). Subcontractor shall obtain all licenses, permits, and inspections applicable to the Work except for licenses, permits, and inspections identified in this Subcontract as Purchaser's or Owner's responsibility. Subcontractor shall also comply with the USA's Foreign Corrupt Practices Act.

00572.11.2 Purchaser and Subcontractor shall abide by the requirements of 41 CFR §§ 60-1.4(a), 60-4.3(a), 60-300.5(a) and 60-741.5(a). These regulations prohibit discrimination against qualified individuals based on their status as protected veterans or individuals with disabilities, and prohibit discrimination



against all individuals based on their race, color, religion, sex, or national origin. Moreover, these regulations require that covered prime contractors and subcontractors take affirmative action to employ and advance in employment individuals without regard to race, color, religion, sex, national origin, protected veteran status or disability.

00572.11.3 Neither party shall engage in any conduct or activity in the performance of this Subcontract that constitutes a conflict of interest under Applicable Laws.

### 00572.12 Business Practices

00572.12.1 Subcontractor shall uphold the good name and reputation of Purchaser and shall not take any action which is intended to or which causes damage to or discredits Purchaser. Subcontractor shall not:

- (a) offer to give or agree to give any director, officer, employee or agent of any potential client a gift or consideration of any kind as an inducement or reward for: (i) doing or declining to do, or for having done or declined to do, any action in relation to obtaining or executing any contract or (ii) for showing or declining to show any favor or disfavor to any person in relation to any possible project; or
- (b) induce or attempt to induce any officer, servant, or agent of any private or public body to depart from his or her duties to his or her client or, in the case of any officer, servant or agent of a public body, his or her duties to the applicable public body, the applicable body politic, or both.

00572.12.2 Subcontractor shall not engage or employ, on a full, part-time or any other basis during the term of the Prime Agreement and for a period of one year after the termination or expiration, any professional or technical personnel who are or have been at any time during the term of the Prime Agreement in the employ of Owner with the explicit written consent of Owner.

00572.12.3 Nondiscrimination:

(a) Subcontractor certifies and agrees that all persons employed by it, its affiliates, subsidiaries, or holding companies are and will be treated equally without regard to or because of race, creed, color, religion, ancestry, national origin, sexual orientation, sex, age, condition of physical or mental handicap, marital status, or political affiliation, in compliance with all Applicable Laws. Subcontractor shall certify, at Purchaser's request that it is in full compliance with all applicable EEO rules and laws.

(b) Purchaser and Owner reserve the right to investigate any claims of illegal discrimination by Subcontractor and in the event a finding of discrimination is made and upon written notification thereof, Subcontractor shall take all necessary steps to cure and rectify such action to the reasonable satisfaction of Purchaser and Owner. Subcontractor's failure or refusal to do so shall be cause for termination of this Subcontract in accordance with the terms of this Subcontract.

00572.12.4 Purchaser is an affirmative action employer. Accordingly, the parties hereby incorporate by reference the requirements of Executive Order 11246, as amended, and the applicable regulations contained in 41 C.F.R. Parts 60-1 through 60-60; 29 U.S.C. Section 793 and the applicable regulations contained in 41 C.F.R. Part 60-741; 38 U.S.C. Section 4212 and the applicable regulations contained in 41 C.F.R. Part 60-250 and/or 60-300; and 29 C.F.R. Part 471, Appendix A to Subpart A.

00572.12.5 Subcontractor represents and warrants that it has a code of conduct or other set of compliance requirements that is at least as broad as Purchaser's Code of Conduct for Global Business Relationships (refer to Article 00672.9, hereinafter "Code of Conduct"), or that it will comply with Purchaser's Code of Conduct in all dealings that affect Purchaser.



### **00572.13 Claims**

Subcontractor must give written notice, with appropriate supporting documentation, of all Claims for extra compensation or additional time for performance of the Work within three calendar days after occurrence of the event giving rise to the Claim. Subcontractor acknowledges that failure of Subcontractor to give Purchaser notice and appropriate supporting documentation within the required time frame constitutes a waiver of all Claims arising out of or related to the event.

### **00572.14 Subcontract Revisions and Work Authorizations**

00572.14.1 Purchaser may make additions, deletions, reductions in scope, or other changes to the Work. If a proposed change will cause a material increase or decrease in Subcontractor's cost or time for performance, Subcontractor shall so notify Purchaser in writing, accompanied by supporting documentation, within three calendar days after Subcontractor's receipt of Purchaser's notice of change. If Purchaser agrees with Subcontractor's notice, the parties will negotiate an equitable adjustment to the Subcontract price, to the schedule, or both, in accordance with the Subcontractor's fee for overhead and profit as listed in Article 00572.14.2 below. These adjustments will be reflected in a written Subcontract revision.

00572.14.2 The Subcontractor's fee for overhead and profit shall be determined as follows:

For costs incurred for labor the maximum fee shall be fifteen percent to the Subcontractor or the Sub-subcontractor performing the Work.

For costs incurred for materials and equipment the maximum fee shall be five percent to the Subcontractor or the Sub-subcontractor providing the materials and equipment.

If applicable, the Subcontractor may receive an additional fee of five percent on labor or materials and equipment performed or provided by a Sub-subcontractor, as long as the total combined fee does not exceed fifteen percent.

00572.14.3 A written Subcontract revision is required before Subcontractor is entitled to payment for the Work performed under the Work authorization. Subcontractor will bear the expense of performing any change not supported by a written Work authorization or written Subcontract revision. Purchaser will not be liable to Subcontractor for Claims arising from a decrease in the Work. No change is effective without a written Work authorization or a written Subcontract revision issued by Purchaser.

### **00572.15 Non-Disclosure**

Subcontractor shall not make any news releases, authorize or participate in any interview concerning this Subcontract, or issue other advertising pertaining to the project or this Subcontract without the prior written approval of Purchaser. Subcontractor shall treat all information provided by Purchaser as confidential and only disclose such information as necessary to perform the Work, and will require the employees, agents, and Subcontractors who need to know to adhere to the terms of this provision.

### **00572.16 Suspension of Work**

Purchaser may, at any time and in its sole discretion, suspend performance of all or part of the Work by written notice to Subcontractor. If the suspension is unrelated to Subcontractor's failure to comply with this Subcontract, Purchaser will adjust the schedule to reflect the reasonable delay due to the suspension and will reimburse Subcontractor for the reasonable and direct additional costs incurred by Subcontractor due solely to the suspension. Subcontractor shall promptly resume performance of all or part of the suspended Work in accordance with Purchaser's written authorization to resume the Work.

### **00572.17 Termination for Cause**

If Subcontractor defaults in any obligation under this Subcontract and does not cure the default within ten calendar days after receipt of Purchaser's written notice identifying the default, Purchaser may terminate all or part of the Work.

### **00572.18 Termination Without Cause**

Purchaser may, at any time and in its sole discretion, terminate all or part of the Work. Subject to Subcontractor's compliance with this Subcontract, Subcontractor will recover from Purchaser, as the complete and final settlement for the terminated Work and all related Claims, a sum equal to Subcontractor's direct cost for the terminated Work satisfactorily performed as of the effective date of termination, plus an allowance for reasonable overhead and profit on such direct cost.

### **00572.19 Purchaser's Remedies**

If Subcontractor by its action or inaction indicates that it is unable or unwilling to proceed with the Work in accordance with the schedule or if Purchaser intends to perform any corrective work under Article 00572.10, Purchaser may, upon written notice to Subcontractor, accomplish the Work in question by the most expeditious means available and back-charge Subcontractor for the costs incurred. Subcontractor shall pay all direct costs incurred by Purchaser under this Article 00572.19, including engineering (charged at \$100/hour), labor, material, transportation, insurance, subcontracts, tools, and equipment. Subcontractor shall also pay twenty-five percent of the direct costs incurred by Purchaser under this Article 00572.19 for Purchaser's overhead and general and administrative costs.

### **00572.20 Indemnity**

00572.20.1 SUBCONTRACTOR AGREES TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE INDEMNIFIED PARTIES AGAINST ANY CLAIM, LOSS, DAMAGE, EXPENSE, OR LIABILITY (INCLUDING ATTORNEYS' FEES AND COSTS OF ANY SUCCESSFUL ENFORCEMENT OF THIS INDEMNITY ARTICLE) ARISING OUT OF THE PERFORMANCE OR NON-PERFORMANCE BY SUBCONTRACTOR OR ITS SUB-SUBCONTRACTORS, OR THEIR OFFICERS, EMPLOYEES, OR AGENTS.

00572.20.2 Providing that Purchaser is not in breach of its obligation to make payments to Subcontractor for the Work, Subcontractor shall indemnify, defend and hold harmless the Indemnified Parties from any claims or mechanic's liens brought against the Indemnified Parties or against the Project as a result of the failure of Subcontractor, or those for whose acts it is responsible, to pay for any services, materials, labor, equipment, taxes or other items or obligations furnished or incurred for or in connection with the Work. Within three (3) days of receiving written notice from Purchaser that such a claim or mechanic's lien has been filed, Subcontractor shall commence to take the steps necessary to discharge said claim or lien, including, if necessary, the furnishing of a mechanic's lien bond. If Subcontractor fails to do so, Purchaser will have the right to discharge the claim or lien and hold Subcontractor liable for costs and expenses incurred, including attorneys' fees.

00572.20.3 Subcontractor will immediately notify Purchaser of any claim or suit made or filed against Subcontractor or its Sub-subcontractors in which Purchaser or Owner is named as a co-defendant.

### **00572.21 Insurance Requirements**

00572.21.1 Subcontractor shall, at its sole cost, maintain insurance as required by this Subcontract and shall impose the obligations of this Article 00572.21.1 on all Sub-subcontractors. Subcontractor shall give Purchaser ACORD insurance certificates evidencing the required coverage by the due date identified in article titled "Schedule of Submittals" and as Purchaser may request from time to time. Subcontractor shall ensure the policies:

- (a) Contain a provision or endorsement that the coverage will not be cancelled, materially changed, or renewal refused unless the insurer gives at least thirty calendar days prior written notice to Purchaser.
- (b) Remain in effect through the warranty period if coverage is occurrence-based and remain in effect at least one year after expiration of the warranty period if coverage is claims-based.



- (c) Are primary with respect to insurance covering Indemnified Parties as additional insureds. All insurance carried by Indemnified Parties will be excess insurance.
- (d) Contain a waiver of all rights of subrogation by the insurance carriers in favor of Indemnified Parties.
- (e) Comply with all Applicable Laws of the jurisdiction in which any part of the Work is to be performed including, but not limited to, admitted and compulsory coverage.
- (f) Are rated "A-" or better by A.M. Best's "Insurance Guide and Ratings."

00572.21.2 Subcontractor shall maintain broad form commercial general liability insurance protecting Subcontractor, and Indemnified Parties as additional insureds (using endorsements CG 20 10 and CG 20 37 or their equivalent), against claims arising out of bodily injury or property damage arising from the Work. The policy must include a cross-liability or severability of interest clause, a per project aggregate endorsement, and coverage for personal injury liability, contractual liability, products and completed operations (covering lawsuits brought in the USA and the country of the jobsite), explosion, building collapse, and damage to underground property. The policy must include coverage for riggers liability if applicable to the Work. Subcontractor shall maintain policy limits of at least one million dollars for each occurrence.

00572.21.3 Subcontractor shall maintain worker's compensation insurance protecting Subcontractor against all claims under applicable worker's compensation laws, including, but not limited to, the United States Longshoremen's and Harbor Worker's Act and the Jones Act. If Subcontractor is required to maintain worker's compensation insurance in the USA, the worker's compensation insurance must contain an "all states" or "other states" endorsement. For Work performed in the USA, Subcontractor shall also maintain employer's liability insurance protecting Subcontractor against claims for injury, disease or death of employees which are not covered by the worker's compensation insurance. Subcontractor shall maintain worker's compensation policy limits as required by statute and, if applicable to this Subcontract, employer's liability policy limits of at least one million dollars for each occurrence.

00572.21.4 Subcontractor shall maintain comprehensive automobile liability insurance protecting Subcontractor, and Indemnified Parties as additional insureds, against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, whether owned, non-owned, or hired. Subcontractor shall maintain policy limits of at least one million dollars for each occurrence.

00572.21.5 Subcontractor shall maintain umbrella liability insurance that follows the form of the commercial general liability insurance, the employer's liability insurance and the automobile liability insurance. The umbrella liability insurance must protect Subcontractor, and Indemnified Parties as additional insureds, against claims in excess of the limits of the commercial general liability insurance, the employer's liability insurance, and the automobile liability insurance. Subcontractor shall maintain policy limits of at least four million dollars for each occurrence.

00572.21.6 Subcontractor is responsible for maintaining any and all property insurance on their own equipment and shall require all Sub-subcontractors to do likewise.

#### **00572.22 Audit**

Purchaser reserves the right to audit the records of Subcontractor. Accordingly, Subcontractor shall make and keep as the same accrue, full and complete records and books of accounts of revenue and income, and costs and expenses that specifically relate to performance under this Subcontract. Records and books of account, together with any or all memoranda pertaining thereto that may be kept, maintained, or possessed by Subcontractor, shall be opened to examination during regular business hours by Purchaser or its representatives for the purposes of inspecting, auditing, verifying, or copying the same or making extracts therefrom. Subcontractor shall make and keep said records and books of

account for a period of seven (7) years after the completion of the contract obligations of the final payment under the Subcontract, whichever is later.

#### **00572.23 Governing Law and Disputes**

Claims and disputes arising out of or relating to this Subcontract will be governed by the law of the State of Missouri, USA, excluding provisions that would apply the law of another jurisdiction. Pending resolution of any claim or dispute, and without prejudice to Subcontractor's rights, Subcontractor shall continue to perform as directed by Purchaser.

#### **00572.24 Hazardous Conditions**

00572.24.1 Subcontractor is not responsible for any Hazardous Conditions encountered in the performance of the Work at the Jobsite. Upon encountering any Hazardous Conditions, Subcontractor will stop services immediately in the affected area and duly notify Purchaser. For purposes of this Subcontract, Hazardous Conditions is defined as any materials, wastes, substances and chemicals deemed to be hazardous under any Applicable Law or the handling, storage, remediation, or disposal of which are regulated by Applicable Laws and applies to any hazardous or toxic substance, material, or condition present at the locations in which the Work is performed which was not brought onto such site or sites by Service Contractor for the exclusive benefit of Subcontractor.

00572.24.2 Subcontractor shall be obligated to resume the Work at the affected areas only after Owner's expert provides it with written certification that (i) the Hazardous Conditions have been removed or rendered harmless and (ii) all necessary approvals have been obtained from all Governmental Authority having jurisdiction over the location.

00572.24.3 Subcontractor will be entitled, to an adjustment in its compensation and all times for performance of the Work to the extent Subcontractor cost or time of performance have been adversely impacted by the presence of Hazardous Conditions, subject to submission of appropriate documentation by Subcontractor and Subcontractor's duty to mitigate.

#### **00572.25 Force Majeure**

00572.25.1 If Subcontractor is delayed in the performance of the Work due to acts, omissions, conditions, events, or circumstances beyond its control, the times for performance shall be reasonably extended by on a not less than day for day basis. By way of example and not of limitation, events that will entitle Subcontractor to an extension of the times for performance include without limitation acts or omissions of Owner or Purchaser, or anyone under Owner's control (including separate contractors), Hazardous Conditions, wars, terrorism, civil unrest, actions and inactions of delay of Governmental Authorities, floods, labor disputes and unrest, unusual delay in transportation, epidemics, earthquakes, tsunami, adverse weather conditions, and acts of God.

00572.25.2 In addition to Subcontractor's right to a time extension for those events set forth above, Subcontractor shall also be entitled to an appropriate increase in the compensation due to the impacts or delays arising from such events. Subcontractor will file all claims in accordance with Article 00572.13.

## 00574 – Jobsite Operations Terms and Conditions

### 00574.1 Subcontractor Scope of Work

Except as expressly provided in this Subcontract, Subcontractor shall furnish all materials, tools, equipment, vehicles, supplies, services, labor and supervision required to perform the Work. Unless otherwise stated in this Subcontract, the Work includes unloading, off transport, hauling, receiving, storing, maintaining, protecting, erecting, installing, cleaning, adjusting, and all other work required to make the Work ready for use.

### 00574.2 Safety Requirements

00574.2.1 Subcontractor shall conduct all operations under this Subcontract in a manner that avoids the risk of bodily harm and damage to property. At a minimum, Subcontractor shall comply with the requirements of this Article 00574.2, Section 00575, the Loss Control Manual, and Owner's safety requirements. Subcontractor's failure to comply with the requirements of this Article 00574.2, Section 00575, the Loss Control Manual, or Owner's safety requirements constitutes a material breach of this Subcontract.

00574.2.2 When at the jobsite, Subcontractor shall continuously inspect all Work and conduct surveys of all Work areas to identify any unsafe condition and shall immediately take adequate precautions against any unsafe condition identified. Subcontractor is solely and exclusively responsible for the discovery and correction of such conditions. Subcontractor agrees that nothing contained in this Article 00574.2, Section 00575, the Loss Control Manual, or Owner's safety requirements shifts responsibility for bodily harm or damage to property sustained resulting from violation of those provisions from Subcontractor to Owner or Purchaser. Subcontractor remains solely and exclusively responsible for compliance with all safety requirements.

00574.2.3 Subcontractor shall immediately correct any unsafe condition identified by Purchaser. If, in Purchaser's sole discretion, Subcontractor has not taken sufficient precautions for the avoidance of bodily harm and damage to property, or in response to Purchaser's identification of an unsafe condition, Purchaser may stop the Work at Subcontractor's expense or implement suitable precautions at Subcontractor's expense, or both. Purchaser's right to stop the Work and to implement suitable precautions does not impose on Purchaser a duty to exercise those rights and does not relieve Subcontractor of responsibility for damage resulting from violation of this Article 00574.2, Section 00575, the Loss Control Manual, or Owner's safety requirements.

00574.2.4 Compliance with this Article 00574.2, Section 00575, the Loss Control Manual, and Owner's safety requirements is the minimum standard required of Subcontractor. Subcontractor is responsible for examining all Work-related requirements and determining whether additional or more stringent health and safety provisions are required or appropriate for the Work. Subcontractor shall notify Purchaser promptly in writing if a charge of noncompliance with this Article 00574.2, Section 00575, the Loss Control Manual or Owner's safety requirements has been filed against Subcontractor or a Sub-subcontractor in connection with the performance of the Work.

### 00574.3 Labor

Subcontractor shall designate a supervisor at the jobsite who has the authority to act on behalf of and to bind Subcontractor in all matters relating to or arising out of this Subcontract. The supervisor must be fluent in English. Subcontractor agrees to replace, at no cost to Purchaser, any Sub-subcontractor or any personnel of Subcontractor or Sub-subcontractor who Purchaser reasonably requests be replaced.

### 00574.4 Protection and Restoration of Property

00574.4.1 Subcontractor shall, at its expense, protect the Work, the environment, and all other property from hazards arising out of or relating to the Work and from natural elements. Subcontractor shall, at its expense, promptly repair or remove and replace any damage or loss and, to the extent practicable,



restore property affected by the Work to its original condition, as determined by Purchaser. Subcontractor is solely responsible for protection of the Work until Final Completion.

00574.4.2 At the completion of the Work, Subcontractor shall remove all Subcontractor-furnished items that are not intended to become a permanent part of the project from the jobsite and shall remove and deposit in Subcontractor-furnished waste facilities all scrap, trash, waste materials, and debris resulting from the Work. Subcontractor shall thoroughly remove all accumulations of dust, scraps, waste, oil, grease, weld spatter, insulation, paint, and other foreign substances resulting from performance of the Work and shall restore all surfaces affected by those substances.

## 00575 - Safety, Health and Accident Prevention

### 00575.1 Project Safety and Health Program

Purchaser will implement and coordinate the overall Project Safety and Health Program as defined in the Loss Control Manual which is available for inspection at the SARP10 Program Office.

### 00575.2 Safety, Health, and Accident Prevention Program

00575.2.1 Subcontractor shall implement and maintain a written Safety, Health and Accident Prevention Program specifically applicable to the Work. Subcontractor's Safety, Health and Accident Prevention Program must meet the requirements of Applicable Laws and adhere to the Project Safety and Health Program, if implemented by Purchaser. Subcontractor shall submit Subcontractor's Safety, Health and Accident Prevention Program for Purchaser's review at least thirty calendar days before starting Work at the jobsite. Purchaser's review does not relieve Subcontractor of Subcontractor's sole responsibility for safety and health in relation to the Work, nor does Purchaser's review limit Subcontractor's obligation to undertake any action necessary to establish and maintain safe working conditions relating to the Work at the jobsite.

00575.2.2 Purchaser may monitor Subcontractor's safety and health performance and may require changes to Subcontractor's Safety, Health and Accident Prevention Program during the performance of the Work. Purchaser's monitoring and requirement of changes does not relieve Subcontractor of Subcontractor's sole responsibility for safety and health in relation to the Work, nor does Purchaser's monitoring and requirement of changes limit Subcontractor's obligation to undertake any action necessary to establish and maintain safe working conditions relating to the Work at the jobsite.

### 00575.3 Hazardous Waste Project Health and Safety Plan

00575.3.1 Subcontractor understands that the Work involves hazardous substances or hazardous wastes. Subcontractor shall comply with all Applicable Laws, Owner's facility rules and regulations, and applicable guidance documents. Subcontractor shall prepare and implement a jobsite-specific Hazardous Waste Project Health and Safety Plan, based on Subcontractor's Safety, Health and Accident Prevention Program and all written programs required by Applicable Laws. Subcontractor is responsible for the completeness and accuracy of Subcontractor's Hazardous Waste Project Health and Safety Plan. Subcontractor shall submit Subcontractor's Hazardous Waste Project Health and Safety Plan to Purchaser at least thirty calendar days before starting Work at the jobsite and shall maintain a copy at the jobsite for review by Purchaser, Owner, and regulatory personnel.

00575.3.2 Before starting Work at the jobsite, Subcontractor shall submit written verification that:

- (a) personnel assigned to the Work have received forty hour health and safety training that meets the requirements of 29 CFR 1910.120(e) or 1926.65(e);
- (b) the assigned field supervisor has completed eight hours of supervisor training that meets the requirements of 29 CFR 1910.120(e)(4) or 1926.65(e)(4); and
- (c) personnel assigned to the Work are participating in a medical surveillance program that meets the requirements of 29 CFR 1910.120(f) or 1926.65(f).

### 00575.4 Protective Clothing, Equipment and Instrumentation

Subcontractor agrees to furnish special protective clothing, respiratory protective equipment, and monitoring instrumentation as required by Applicable Laws, the project's safety-related plans and programs, and Purchaser's and Owner's rules and regulations. Subcontractor shall ensure that personnel performing Work at the jobsite properly use the clothing, equipment, and instrumentation. Subcontractor shall furnish and maintain all safety equipment, including but not limited to, barriers, signs, warning lights, and guards necessary for adequate protection of persons and property.



### 00575.5 Safety and Health Representative

The Subcontractor shall identify a qualified person to be its representative for Environmental, Safety, Health & Security matter and make this person available as needed and requested by the Purchaser. The representative must have authority to correct unsafe conditions and to stop Work in the area of an unsafe condition. In addition, the representative shall routinely visit the jobsite.

### 00575.6 Safety and Health Goal

Subcontractor shall endeavor to attain the project's safety goal of zero injuries. Subcontractor shall maintain accurate accident and injury reports and shall furnish Purchaser a monthly summary of injuries and man-hours lost due to injuries by the third of each month. Subcontractor accident rates must be calculated monthly in accordance with the Bureau of Labor Statistics incident rate, frequency rate, and days away from work rate methods. If Subcontractor or Sub-subcontractor accident rates exceed the project's safety goal, Subcontractor shall take immediate corrective action, which may include, but is not limited to:

- (a) submittal of a written corrective action plan to Purchaser by Subcontractor;
- (b) additions or modifications to Subcontractor's Safety, Health and Accident Prevention Program;
- (c) removal from the jobsite of any Subcontractor or Sub-subcontractor personnel not implementing or following the necessary safety and health measures; and
- (d) increasing the amount of Subcontractor safety and health training.

### 00575.7 Drug Prevention Program

As part of the Work, Subcontractor shall assist Purchaser in administering the project requirements for a drug detection and prevention program. Subcontractor agrees that all costs for drug testing and alcohol testing are included in the Subcontract price. Subcontractor must provide evidence to Purchaser that all personnel assigned to the Work at the jobsite have passed the drug test within three calendar days of completion of the test. The drug detection and prevention program will include, but will not be limited to, the following: (a) a pre-jobsite assignment test; and (b) post-jobsite assignment tests, such as reasonable suspicion tests, post-accident tests, and unannounced random drug tests of ten percent of the workforce on a monthly basis.

### 00575.8 Fall Protection

The OSHA Fall Protection Standard 29 CFR 1926 Subpart M shall be strictly adhered to by the Subcontractor. Fall protection is required for all of Subcontractor's Work operations one hundred percent of the time, whether climbing, traveling, or working. NO WORK OPERATION is exempt from the six (6) foot fall protection requirement.

Prior to starting work operations requiring fall protection, Subcontractor shall submit to Purchaser a fall protection plan. The fall protection plan shall include, but not be limited to, the following:

Name of qualified person in charge of operation.

Description of work operation.

List of fall exposures.

Description of fall protection methods used to eliminate fall exposures.

Training and enforcement methods used to ensure employee compliance with the plan.



Fall protection body harnesses, lanyards, and lifelines shall be used in accordance with OSHA Standard 1926 Subpart 502D, with the following exceptions:

Full body harnesses shall be used in lieu of safety belts.

Only lanyards with shock absorbers and locking type snap hooks shall be used.

At least two lanyards shall be used to provide one hundred percent fall protection when moving around obstructions, connection points, or other similar items.

Fall protection guardrail systems shall comply with OSHA Standard 1926 Subpart 502(b) except manila, plastic, or synthetic rope shall not be used as guardrails.

#### **00575.9 Sub-subcontractor Safety Prequalification**

Prior to any Sub-subcontractor performing Work on the Jobsite the Sub-subcontractor must obtain a Sub-subcontractor safety prequalification from Purchaser. In order to obtain the safety prequalification, Subcontractor or its Sub-subcontractor shall submit to Purchaser evidence that the Sub-subcontract has an Experience Modification Rating or equivalent rating of 1.0 or less and that incident rates (Recordable Incident Rate, Loss Time Incident Rate, and Days Away/Restricted or Job Transfer rate) are below the national average during the last three years. In addition, Subcontractor or Sub-subcontractor must submit sufficient information to allow Purchaser to evaluate any Occupational Safety and Health Administration (OSHA) violations received by Sub-subcontractor within the last three years and any other documentation Purchaser may reasonably require. Purchaser's safety manager will review the submission and provide a safety prequalification if Purchaser, in its sole discretion, determines the Sub-subcontractor meets Purchaser's safety requirements. Subcontractor or its Sub-subcontractor must submit the requirements prior to Sub-subcontractor first mobilizing to the Jobsite.

#### **00575.10 Confined Spaces**

All employees entering confined spaces and all attendants for such entries including supervisors shall receive confined space entry training and emergency rescue training at a minimum of once per year.

**00672 - General Conditions Attachments**

**00672.1 Partial Waiver and Release of Lien Rights**

**AFFIDAVIT AND PARTIAL WAIVER OF CLAIMS AND LIENS  
AND RELEASE OF RIGHTS FOR SUBCONTRACTORS**

The undersigned, who is the \_\_\_\_\_ (designate title) of \_\_\_\_\_ which is the \_\_\_\_\_ (designate whether subcontractor, supplier or otherwise) for the \_\_\_\_\_ (designate the type of work, supplies or services rendered) on the improvements constructed on the premises hereafter identified, declares that his contract with \_\_\_\_\_ (General Contractor) is in the total amount of \$ \_\_\_\_\_, which includes extras and all change orders to the date hereof.

The undersigned further states that as of \_\_\_\_\_ (date) the total value of work completed and material stored is \$ \_\_\_\_\_. Of this amount \$ \_\_\_\_\_ has been received (the receipt and sufficiency of which is hereby acknowledged by the undersigned including \$ \_\_\_\_\_ in payment of Payment Application or Invoice Number \_\_\_\_\_. A total of \$ \_\_\_\_\_ is being held as retainage.

In consideration of the amounts and sums received, the undersigned does hereby waive and release to the **City of Memphis (Owner)** and to \_\_\_\_\_ (General Contractor) any and all claims and liens and rights to liens upon the premises described below and upon improvements now thereon, and upon the monies or other considerations (due as of the date of the aforesaid payment application or invoices from the **City of Memphis (Owner)** or \_\_\_\_\_ (General Contractor) or from any other person, firm or corporation), said claims and liens and rights to liens being on account of labor, services, materials, fixtures or apparatus heretofore furnished by or at the request of the undersigned. The premises as to which said claims and liens and rights to liens are hereby released are identified as follows:

**Project Name:**

**Address of Project:**

**City:** \_\_\_\_\_ **County:** Shelby **State:** TN **Zip Code:** \_\_\_\_\_

The undersigned further represents and warrants that he is duly authorized and empowered to sign and execute this waiver on his own behalf and on behalf of the company or business for which he is signing; that he has properly performed all work and furnished all the materials of the specified quality per plans and specifications and in a good and workmanlike manner through the date of said payment application or invoice; that he has paid for all the labor, materials, equipment, and services that he has used or supplied to the above premises through the date of said payment application or invoice; that he has no other outstanding and unpaid payment applications, invoices, retentions, holdbacks, chargebacks or unbilled work or materials against \_\_\_\_\_ (General Contractor) as of the date of the aforementioned payment application; and that any materials which have been supplied or incorporated into the above premises were either taken from his fully-paid or open stock or were fully paid for and supplied as stated on the payment application or invoice.

The undersigned further agrees to reimburse and does hold harmless and fully indemnify the **City of Memphis (Owner)** and \_\_\_\_\_ (General Contractor) for any losses or expenses should any such claims, lien or right to a lien be asserted (by the undersigned or by any laborer, materialman or subcontractor of the undersigned), including, without implied limitation, attorneys' fees incurred in the defense thereof.



The undersigned further accepts and acknowledges the receipt of the aforesaid sums in full accord and satisfaction for the aforementioned claims with full knowledge that the contractors, **City of Memphis (Owner)** and \_\_\_\_\_ (General Contractor), their successors and assigns, are relying thereon; and furthermore, the undersigned agrees to perform, now and in the future, each and every covenant and provision of this written contract or supplier's agreement (as the case may be) as modified or changed in writing with \_\_\_\_\_ (General Contractor) or any subcontractor of \_\_\_\_\_ (General Contractor) hereby acknowledging that said contract or supplier's agreement is now in full force and effect.

In addition, for and in consideration of the amounts and sums received, the undersigned hereby waives, releases and relinquishes any and all claims, rights or causes of action whatsoever arising out of or in the course of the work performed on the above-mentioned project, contract or event transpiring prior to the date hereof, excepting the right to receive payment for work performed and properly completed and retainage, if any, after the date of the above-mentioned payment application or invoices.

Signed and delivered the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.  
Company \_\_\_\_\_

By: \_\_\_\_\_  
(Printed Name)

\_\_\_\_\_  
(Signature)

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

Before me, the undersigned Notary Public in and for the said County and State, personally appeared \_\_\_\_\_, and acknowledged execution of the foregoing affidavit as his voluntary act and deed and further stated that the facts recited are true of his personal knowledge.

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

\_\_\_\_\_  
Notary Public  
Residence

County/State: \_\_\_\_\_

**00672.2 Final Waiver and Release of Lien Rights**

**AFFIDAVIT AND FINAL WAIVER OF CLAIMS AND LIENS AND RELEASE OF RIGHTS FOR SUBCONTRACTORS**

The undersigned, who is the \_\_\_\_\_ (designate title) of \_\_\_\_\_ which is the \_\_\_\_\_ (designate whether subcontractor, supplier or otherwise) for the \_\_\_\_\_ (designate the type of work, supplies or services rendered) on the improvements constructed on the premises hereafter identified, declares that his contract with \_\_\_\_\_ (General Contractor) is in the total amount of \$ \_\_\_\_\_, which includes extras and all change orders to the date hereof.

The undersigned further states that as of \_\_\_\_\_ (date) all work on said project has been performed and completed in accordance with the plans and specifications for the project, and said work has been accomplished in accordance with the terms and conditions of his subcontract and those documents which, by reference, are a part of said subcontract. The total value of work completed and material stored is \$ \_\_\_\_\_. Of this amount \$ \_\_\_\_\_ has been received (the receipt and sufficiency of which is hereby acknowledged by the undersigned including \$ \_\_\_\_\_ in payment of Payment Application or Invoice Number \_\_\_\_\_. A total of \$ \_\_\_\_\_ is being held as retainage.

In consideration of the amounts and sums received, the undersigned does hereby waive and release to the **City of Memphis (Owner)** and to \_\_\_\_\_ (General Contractor) any and all claims and liens and rights to liens upon the premises described below and upon improvements now thereon, and upon the monies or other considerations (due as of the date of the aforesaid payment application or invoices from the **City of Memphis (Owner)** or \_\_\_\_\_ (General Contractor) or from any other person, firm or corporation), said claims and liens and rights to liens being on account of labor, services, materials, fixtures or apparatus heretofore furnished by or at the request of the undersigned. The premises as to which said claims and liens and rights to liens are hereby released are identified as follows:

**Project Name:**

**Address of Project:**

**City:** \_\_\_\_\_ **County:** Shelby **State:** TN **Zip Code:** \_\_\_\_\_

The undersigned further represents and warrants that he is duly authorized and empowered to sign and execute this waiver on his own behalf and on behalf of the company or business for which he is signing; that he has properly performed all work and furnished all the materials of the specified quality per plans and specifications and in a good and workmanlike manner as required by the contract; that he has paid for all the labor, materials, equipment, and services that he has used or supplied to the above premises as required by the contract; that he has no other outstanding and unpaid payment applications, invoices, retentions, holdbacks, chargebacks or unbilled work or materials against \_\_\_\_\_ (General Contractor); and that any materials which have been supplied or incorporated into the above premises were either taken from his fully-paid or open stock or were fully paid for and supplied as stated on the payment application or invoice.

The undersigned further agrees to reimburse and does hold harmless and fully indemnify the **City of Memphis (Owner)** and \_\_\_\_\_ (General Contractor) for any losses or expenses should any such claims, lien or right to a lien be asserted (by the undersigned or by any laborer, materialman or subcontractor of the undersigned), including, without implied limitation, attorneys' fees incurred in the defense thereof.



The undersigned further accepts and acknowledges the receipt of the aforesaid sums in full accord and satisfaction for the aforementioned claims with full knowledge that the contractors, **City of Memphis (Owner)** and \_\_\_\_\_ (General Contractor), their successors and assigns, are relying thereon; and furthermore, the undersigned agrees to perform, now and in the future, each and every covenant and provision of this written contract or supplier's agreement (as the case may be) as modified or changed in writing with \_\_\_\_\_ (General Contractor) or any subcontractor of \_\_\_\_\_ (General Contractor) hereby acknowledging that said contract or supplier's agreement is now in full force and effect.

In addition, for and in consideration of the amounts and sums received, the undersigned hereby waives, releases and relinquishes any and all claims, rights or causes of action whatsoever arising out of or in the course of the work performed on the above-mentioned project, contract or event transpiring prior to the date hereof, except retainage, if any, after the date of the above-mentioned payment application or invoices.

Signed and delivered the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.  
Company \_\_\_\_\_

By: \_\_\_\_\_  
(Printed Name)

\_\_\_\_\_  
(Signature)

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

Before me, the undersigned Notary Public in and for the said County and State, personally appeared \_\_\_\_\_, and acknowledged execution of the foregoing affidavit as his voluntary act and deed and further stated that the facts recited are true of his personal knowledge.

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

\_\_\_\_\_  
Notary Public  
Residence County/State: \_\_\_\_\_



**00672.3 Certificate of Nondiscrimination (1 page)**



As Bidder, Contractor, or Subcontractor on Purchaser's Contract, Rodney Baber Park Sewer Improvements

The undersigned states that it does not discriminate against any subcontractor, employee, or applicant for employment on the grounds of race, color, national origin or sex and, if awarded a contract for this project, agrees in performance of work:

1. Not to discriminate against any subcontractor, employee, or applicant for employment on the grounds of race, color, national original or sex;
2. To maintain payrolls of laborers and mechanics employed on this contract until seven (7) years after final release and final payment by the City;
3. To require a similar certificate to be executed by each subcontractor at the time a subcontract is executed under the contract with the requirement that such subcontractor agrees to require a similar certificate of requirement on any lower tiers of subcontracts.
4. To conform to federal law, state statutes, executive orders, and local ordinances identified and listed under Non-discrimination, Section 00280.7.

\_\_\_\_\_  
Service Contractor's Name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed or Typed Name and Title

**THIS FORM MUST BE SUBMITTED WITH THE PROPOSAL OR THE PROPOSAL MAY BE  
CONSIDERED NON-CONFORMING.**



#### 00672.4 Equal Business Opportunity Program

*This form must be submitted with Bidder's bid. Failure to execute and submit this document with Bidder's bid may cause the Bid to be rejected as non-conforming. In addition, each Sub-Subcontractor must execute the form.*

This Subcontract will be subject to the requirements of the City of Memphis Ordinance #5384 which establishes the Equal Business Opportunity ("EBO") Program. It is up to the Respondent to ensure that all requirements of this ordinance are met. The Ordinance may be accessed on the City's website at [www.memphistn.gov](http://www.memphistn.gov) under "Office of Contract Compliance". The intent of the EBO Program is to increase the participation of locally owned minority and women owned business enterprises ("M/WBE"). Toward achieving this objective, the overall M/WBE participation goal for this solicitation is 15%. The percentage of overall M/WBE participation is defined as the dollar value of subcontracts awarded to certified (as identified by the City of Memphis EBO list) minority and/or women business enterprises divided by the total proposed base bid amount.

Additionally, in accordance with federal executive Order 11625 and 12138, the local government must make a good faith effort to include participation from Disadvantage Business enterprises (DBE) in sub-agreement awards. The SRF Fair Share DBE goal for this project is a minimum of **2.6%** WBE and minimum of **2.6%** MBE (as identified by the Tennessee Uniform Certification Program list, other State or Federal DBE lists, or the City of Memphis EBO list).

#### SRF Fair Share Goals:

MBE goal – Construction 2.6%

WBE goal – Construction 2.6%

(Vendors from the TDOT TNUCP DBE list, other State or Federal DBE lists, or the City of Memphis EBO list)

SARP10 DBE Participation goal: 15%

(Vendors from the City of Memphis EBO list only)

#### Participation Plan

The Participation Plan must include: (1) level and dollar amount of participation your firm anticipates to achieve in the performance of contract resulting from this RFB; (2) the type of work to be performed by the M/WBE participation; and (3) the names of the M/WBE and/or DBE firm(s) the Respondent plans to utilize in the performance of the contract resulting from this RFB.

#### Eligible M/WBE and/or DBE Firms

To qualify as a M/WBE firm, per the requirements of City of Memphis Ordinance #5384, a firm must be included on the City's EBO list of certified M/WBE firms. All contractors identified as an SRF Fair Share M/WBE firm must be on the Tennessee Uniform Certification Program (TNUCP) list, other State or Federal DBE lists, or the City of Memphis EBO list at the time of the bid opening.

A list of the City's eligible M/WBE firms may be requested from Purchaser as a guide only. If a Bidder desires to utilize an M/WBE firm not included on the list, it is the Bidder's responsibility to confirm that the desired firm is certified by the City of Memphis. Such confirmation must be obtained from the City's Contract Compliance Office, in writing, before the bid/response due date. Requests for verification must be submitted to the City's Contract Compliance Office listed below:

Mary Bright, Esq.  
City of Memphis, Contract Compliance Office  
125 North Main Street, Suite 546  
Memphis, TN 38103  
Phone: (901) 576-6210 - Fax: (901) 576-6560  
Email: [mary.bright@memphistn.gov](mailto:mary.bright@memphistn.gov)



**MINORITY/WOMEN BUSINESS ENTERPRISE COMPLIANCE FORM**

**SERVICE CONTRACT TITLE: Rodney Baber Park Sewer Improvements**

Project M/WBE Goal:    MBE minimum            **2.6%**  
    WBE minimum            **2.6%**  
    DBE minimum            **15%**

The following sections must be completed by Bidder. A certified subcontractor or supplier is defined as a firm from the list of certified firms provided with this specification.

\_\_\_\_\_  
 Bidder's Name

Section A - If the Bidder is a certified firm, so indicate here with a check mark.

\_\_\_\_\_ MBE            \_\_\_\_\_ WBE            \_\_\_\_\_ DBE

Section B - Identify below those certified firms that will be employed as subcontractors or suppliers on this Project. By submitting this Proposal, the Bidder commits to the use of the firms listed below.

\$                    =            Show the dollar value of the subcontract to be awarded to this firm

%                    =            Show the percentage this subcontract is of your base Proposal

M/WBE =    Show by inserting an M or W whether the subcontractor is an MBE or WBE

<u>\$</u>	<u>%</u>	<u>M/WBE</u>	<u>DBE</u>	<u>CERTIFIED SUBCONTR. NAME, ADDRESS, TEL. #</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

\$ \_\_\_\_\_ % \_\_\_\_\_ = **Total M/WBE and/or DBE**

**THIS FORM MUST BE SUBMITTED WITH THE PROPOSAL OR THE PROPOSAL MAY BE CONSIDERED NON-CONFORMING.**



**00672.5 Report of Disadvantaged Business Enterprise Participation Form (1 page)**



PROJECT NUMBER: \_\_\_\_\_

## SUBCONTRACTOR'S REPORT OF DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION

Project Name: \_\_\_\_\_ Month of \_\_\_\_\_, 201\_\_\_\_\_  
General Contractor: \_\_\_\_\_  
Contact Person: \_\_\_\_\_ Telephone: \_\_\_\_\_  
Address: \_\_\_\_\_ Email: \_\_\_\_\_  
Amount of Subcontract: \$ \_\_\_\_\_ MBE \_\_\_\_\_ WBE \_\_\_\_\_  
  %: \_\_\_\_\_ %: \_\_\_\_\_

***DBE Information: Circle either MBE or WBE and Complete Form.***

MBE/WBE Firm Name: \_\_\_\_\_ Contact Person: \_\_\_\_\_  
Date of Award: \_\_\_\_\_ Contract Value: \$ \_\_\_\_\_  
Completed-to-Date: \$ \_\_\_\_\_ Paid-to-Date: \$ \_\_\_\_\_  
Work Description: \_\_\_\_\_ Telephone #: \_\_\_\_\_  
Comments: \_\_\_\_\_ Email: \_\_\_\_\_

MBE/WBE Firm Name: \_\_\_\_\_ Contact Person: \_\_\_\_\_  
Date of Award: \_\_\_\_\_ Contract Value: \$ \_\_\_\_\_  
Completed-to-Date: \$ \_\_\_\_\_ Paid-to-Date: \$ \_\_\_\_\_  
Work Description: \_\_\_\_\_ Telephone #: \_\_\_\_\_  
Comments: \_\_\_\_\_ Email: \_\_\_\_\_

MBE/WBE Firm Name: \_\_\_\_\_ Contact Person: \_\_\_\_\_  
Date of Award: \_\_\_\_\_ Contract Value: \$ \_\_\_\_\_  
Completed-to-Date: \$ \_\_\_\_\_ Paid-to-Date: \$ \_\_\_\_\_  
Work Description: \_\_\_\_\_ Telephone #: \_\_\_\_\_  
Comments: \_\_\_\_\_ Email: \_\_\_\_\_

MBE/WBE Firm Name: \_\_\_\_\_ Contact Person: \_\_\_\_\_  
Date of Award: \_\_\_\_\_ Contract Value: \$ \_\_\_\_\_  
Completed-to-Date: \$ \_\_\_\_\_ Paid-to-Date: \$ \_\_\_\_\_  
Work Description: \_\_\_\_\_ Telephone #: \_\_\_\_\_  
Comments: \_\_\_\_\_ Email: \_\_\_\_\_

***Attach additional pages as required.***

General Contractor's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**00672.6 State Revolving Fund (SRF) Front-Ends (50 pages)**

This Project 179821.71.0402 must maintain SRF compliance for the SARP10 Program, the SRF "Front-Ends" consisting of various forms and documents are attached herein. Furthermore, Davis Bacon is referenced within these SRF Front-Ends, and applies to the scope of Work. As a special note, the Bidder's Requirements on page 17 of 50 of the SRF Front-Ends, outlines Pre-Bid Requirements where all bidders must send certified mail and return receipts to a minimum of 10 certified DBE subcontractors, soliciting their service.

The following SRF Forms are to be submitted with your Bid and will be attached to the Subcontract:

1. Certification Regarding Debarment (page 2 of 50)
2. Certification Regarding Equal Employment Opportunity (page 3 of 50)

# STATE REVOLVING FUND LOAN PROGRAM

## Inserts for Specifications

### Clean Water – Unsubsidized

#### Projects Funded with FY 2010 and After Funds

Subject	File Name
Certification Regarding Debarment	02_CertificationRegardingDebarment.pdf
Certification Regarding Equal Employment Opportunity	03_CertificationRegardingEqualEmploymentOps.pdf
Retainage – TCAs 66-34-104, 203,103	04_RetainageTCAs.pdf
Advertisement for Bids Example – DBE	05_AdvertisementForBidsExample_DBE.pdf
<del>DBE-Guidance Document</del>	06_DBE01_GuidanceDocument.pdf
DBE-Loan Recipient's Requirements	06_DBE02_LoanRecip_Requirements.pdf
DBE-Loan Recipient's Good Faith Effort Letter	06_DBE03_LoanRecip_GoodFaithEffortLtr.pdf
DBE-Loan Recipient's Certification Summary Form	06_DBE04_LoanRecip_CertificationSummaryForm.pdf
DBE-Bidder's Requirements	06_DBE05_BidderRequirements.pdf
<del>DBE Form 6100-2 Contractor Receipt Letter</del>	06_DBE06_Form6100_2_ContractorReceiptLtr.pdf
<del>DBE Form 6100-2 Subcontractor Participation</del>	06_DBE07_Form6100_2_SubcontractorParticipation.pdf
<del>DBE Form 6100-3 Subcontractor Performance</del>	06_DBE08_Form6100_3_SubcontractorPerformance.pdf
<del>DBE Form 6100-4 Subcontractor Utilization</del>	06_DBE09_Form6100_4_SubcontractorUtilization.pdf
DBE-Certified List	06_DBE10_CertifiedList.pdf
Davis Bacon Poster - English	08_DavisBacon_Poster_English.pdf
Davis Bacon Poster - Spanish	08_DavisBaconsigninSpanish.pdf
Project Wage Sheet - HUD-4720	08_ProjectWageSheet_HUD-4720.pdf
Wage Rate - Bidder's Guidance to Davis Bacon	08_WageRates_BidderGuidanceToDavisBacon_20110215.pdf
Wage Rate – Loan Recipient's Guidance to DavisBacon	08_WageRates_LoanRecipGuidanceToDavisBacon_20110215.pdf
Tracking and Reporting – Loan Recipient's and Contractor's Guidance	09_TrackingAndReporting_LoanRecipAndBidderGuidance_FY2010andAfter.pdf
Storm Water General Permit NOI	11_StormWater_NOI.pdf
Storm Water General Permit NOT	11_StormWater_NOT.pdf
Project Sign Detail - Clean Water – Unsubsidized	14_CWSRF_ProjectSign_Color_Unsubsidized.pdf
Project Sign Detail - Clean Water – Unsubsidized	14_CWSRF_ProjectSign_NoColor_Unsubsidized.pdf
Bid Package Submittal Requirements	15_BidPackageSubmittalRequirements.pdf
Letter In Lieu of a Site Certificate	16_LetterInLieuofaSiteCertificate.pdf
Site Certificate	16_SiteCertificate.pdf



# U.S. Environmental Protection Agency

## CERTIFICATION REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS

The prospective participant certifies to the best of its knowledge and belief that it and its principals:

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- (b) Have not within a three year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statues or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and
- (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

---

Typed Name & Title of Authorized Representative

---

Signature of Authorized Representative

---

Date

I am unable to certify to the above statements. My explanation is attached.

**CERTIFICATION BY PROPOSED PRIME OR SUBCONTRACTOR REGARDING  
EQUAL EMPLOYMENT OPPORTUNITY**

---

**Name of Prime Contractor**

**Project Number**

**INSTRUCTIONS**

This certification is required pursuant to Executive Order 11246, Part II, Section 203 (b), 30 F.R. 12319-25). Any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicated that the prime or subcontractor has not filed a compliance report due under applicable instruction, such contractor shall be required to submit a compliance report.

---

**CONTRACTOR'S CERTIFICATION**

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

**Address:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

1. Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause. Yes  No
2. Compliance Reports were required to be filed in connection with such contract or subcontract. Yes  No

If yes, state what reports were filed and with what agency.

\_\_\_\_\_

3. Bidder has filed all compliance reports due under applicable instructions, including SF-100. Yes  No
4. If answer to Item 3 is NO, please explain in detail on reverse side of this certification.

---

Certification - The information above is true and complete to the best of my knowledge and belief. (A willfully false statement is punishable by law-U.S. Code, Title 18, Section 1001.)

---

**Name and title of signer (Please type)**

---

**Signature**

---

**Date**

\*\*\* Current through the 2012 Regular Session \*\*\*

Title 66 Property  
Chapter 34 Prompt Pay Act  
Part 1 General Provisions

Tenn. Code Ann. § 66-34-103 (2012)

**66-34-103. Withholding of retainage -- Violations -- Penalties.**

(a) All construction contracts on any project in this state, both public and private, may provide for the withholding of retainage; provided, however, that the retainage amount may not exceed five percent (5%) of the amount of the contract.

(b) The owner, whether public or private, shall release and pay all retainages for work completed pursuant to the terms of any contract to the prime contractor within ninety (90) days after completion of the work or within ninety (90) days after substantial completion of the project for work completed, whichever occurs first. As used in this subsection (b), work completed shall be construed to mean the completion of the scope of the work and all terms and conditions covered by the contract under which the retainage is being held. The prime contractor shall pay all retainages due any subcontractor within ten (10) days after receipt of the retainages from the owner. Any subcontractor receiving the retainage from the prime contractor shall pay to any subsubcontractor or material supplier all retainages due the subsubcontractor or material supplier within ten (10) days after receipt of the retainages.

(c) Any default in the making of the payments shall be subject to those remedies provided in this part.

(d) In the event that an owner or prime contractor withholds retainage that is for the use and benefit of the prime contractor or its subcontractors pursuant to § 66-34-104(a) and (b), neither the prime contractor nor any of its subcontractors shall be required to deposit additional retained funds into an escrow account in accordance with § 66-34-104(a) and (b).

(e) (1) It is an offense for a person, firm or corporation to fail to comply with subsection (a) or (b) or § 66-34-104(a).

(2) (A) A violation of this subsection (e) is a Class A misdemeanor, subject to a fine only of three thousand dollars (\$3,000).

(B) Each day a person, firm or corporation fails to comply with subsection (a) or (b) or § 66-34-104(a) is a separate violation of this subsection (e).

(C) Until the violation of this subsection (e) is remediated by compliance, the punishment for each violation shall be consecutive to all other such violations.

(3) In addition to the fine imposed pursuant to subdivisions (e)(2)(A) and (B), the court shall order restitution be made to the owner of the retained funds. In determining the appropriate amount of restitution, the formula stated in § 40-35-304 shall be used.

**HISTORY:** Acts 2007, ch. 201, § 3; 2008, ch. 804, § 3; 2012, ch. 609, § 1.

\*\*\* Current through the 2012 Regular Session \*\*\*

Title 66 Property  
Chapter 34 Prompt Pay Act  
Part 1 General Provisions

Tenn. Code Ann. § 66-34-104 (2012)

**66-34-104. Retention of portion of contract price in escrow -- Applicability -- Mandatory compliance.**

(a) Whenever, in any contract for the improvement of real property, a certain amount or percentage of the contract price is retained, that retained amount shall be deposited in a separate, interest-bearing, escrow account with a third party which must be established upon the withholding of any retainage.

(b) As of the time of the withholding of the retained funds, the funds shall become the sole and separate property of the prime contractor or remote contractor to whom they are owed, subject to the rights of the person withholding the retainage in the event the prime contractor or remote contractor otherwise entitled to the funds defaults on or does not complete its contract.

(c) In the event that the party withholding the retained funds fails to deposit the funds into an escrow account as provided herein, such party shall be responsible for paying the owner of the retained funds an additional three hundred dollar (\$300) penalty per day for each and every day that such retained funds are not deposited into such escrow account.

(d) The party with the responsibility for depositing the retained amount in a separate, interest-bearing, escrow account with a third party shall have the affirmative duty to provide written notice that it has complied with the requirements of this section to any prime contractor upon withholding the amount of retained funds from each and every application for payment, including:

(1) Identification of the name of the financial institution with whom the escrow account has been established;

(2) Account number; and

(3) Amount of retained funds that are deposited in the escrow account with the third party.

(e) Upon satisfactory completion of the contract, to be evidenced by a written release by the owner or prime contractor owing the retainage, all funds accumulated in the escrow account together with all interest on the account shall be paid immediately to the prime contractor or remote contractor to whom the funds and interest are owed.

(f) In the event the owner or prime contractor, as applicable, fails or refuses to execute the release provided for in subsection (c), then the prime contractor or remote contractor, as applicable, may seek any remedy in a court of proper jurisdiction and the person holding the fund as escrow agent shall bear no liability for the nonpayment of the fund to the prime contractor or remote contractor; provided, however, that all claims, demands, disputes, controversies, and differences that may arise between the owner, prime contractor or prime contractors, and remote contractor or remote contractors regarding the funds may be, upon written agreement of all parties concerned, settled by arbitration conducted pursuant to the Tennessee Uniform Arbitration Act, compiled in title 4, chapter 5, part 3, or the Federal

Arbitration Act, 9 U.S.C. § 1, et seq., as may be applicable.

**(g)** In contracts to which the state or any department, board or agency of the state, including the University of Tennessee, is a party, interest shall be paid on the retained amounts at the same rate interest is paid on the funds of local governments participating in the local government investment pool established pursuant to § 9-4-704, for the contract period.

**(h)** The provisions of this section shall be applicable to the state, any department, board or agency of the state, including the University of Tennessee, and all counties and municipalities and all departments, boards or agencies of the counties and municipalities, including all school and education boards, and any other subdivision of the state.

**(i)** This section shall be applicable to all prime contracts and all subcontracts thereunder for the improvement of real property when the contract amount of such prime contract is five hundred thousand dollars (\$500,000) or greater, notwithstanding the amount of such subcontracts.

**(j)** Compliance with this section shall be mandatory, and may not be waived by contract.

**(k)** Failure to deposit the retained funds into an escrow account as provided herein, within seven (7) days' receipt of written notice regarding such failure, is a Class A misdemeanor.

**HISTORY:** Acts 1975, ch. 345, §§ 1-4; T.C.A., §§ 64-1148 -- 64-1151; Acts 1985, ch. 340, §§ 1, 2; 1986, ch. 551, § 9; 2007, ch. 189, § 43; 2007, ch. 201, §§ 1, 2; T.C.A. § 66-11-144; Acts 2008, ch. 804, §§ 1, 2; 2010, ch. 875, §§ 1, 2; 2012, ch. 609, §§ 2-5.

TENNESSEE CODE ANNOTATED  
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\*\*\* Current through the 2012 Regular Session \*\*\*

Title 66 Property  
Chapter 34 Prompt Pay Act  
Part 2 Owner/Contractor Payment

Tenn. Code Ann. § 66-34-203 (2012)

**66-34-203. Withholding of payment or retainage by owner.**

Nothing in this chapter shall prevent the owner from reasonably withholding payment or a portion of a payment to the contractor; provided, that such withholding is in accordance with the provisions of the written contract between the owner and the contractor. The owner may also withhold a reasonable amount of retainage as specified in the written contract between the owner and the contractor; provided, however, that the retainage amount may not exceed five percent (5%) of the amount of the contract.

**HISTORY:** Acts 1991, ch. 45, § 1; 2007, ch. 201, § 4.

## ADVERTISEMENT FOR BIDS EXAMPLE – DBE

The {City/Town/County/Utility District/Authority} will receive separate sealed BIDS for the construction of a {water or wastewater} project at {location to deliver bid proposal} until {closing time}, local time, on {date}, and, then, at said time, publicly open and read the BIDS aloud.

The work to be bid on is as follows: {Description of work to be performed here.}

The allotted time for construction is {# of days for work to be performed} calendar days.

The information for Bidders; Bid Form; Form of Agreement; Drawings; Specifications information; Bid Bond, Performance Bond, and Payment Bond information; and other contract documents may be examined at the addresses below:

{Please type address of consulting engineer's office}

{Please type address of City/Town/Utility District/Authority}

Builder's Exchange of Tennessee

Nashville Office

Knoxville Office

2322 Winford Ave.

300 Clark Street

Nashville, TN 37211

Knoxville, TN 37921

Copies of the CONTRACT DOCUMENTS may be obtained at the {name of office to pick up contract documents} Office, located at {address of office}, upon payment of \$ {Amount} for each set.

Any BIDDER, upon returning the CONTRACT DOCUMENTS within {number of days} days after BID opening and in good condition, will be refunded {his/her payment or \$ amount} and any non-bidder will be refunded \$ {Amount}.

No bid may be withdrawn within (#) days after the scheduled time for receipt of bids.

### **DAVIS-BACON ACT REQUIREMENTS**

This project is being funded by a State Revolving Fund loan on or after 2010 EPA Fiscal Year. The loan recipient must be in compliance with all applicable Davis-Bacon Act.

### **DISADVANTAGED BUSINESS ENTERPRISES (DBE) REQUIREMENTS**

Any contract or contracts awarded by the Owner through this invitation for bids will be funded by a State Revolving Fund (SRF) loan from the State of Tennessee. State and Federal funds will be involved in this project, and, as a result, Bidders must comply with the SRF Loan Program's Disadvantaged Business Enterprises (DBE) requirements including contacting a minimum of 10 qualified DBE sub-contractors, professional service providers, vendors, and/or suppliers by certified mail to solicit bids. The apparent successful Bidder must submit to the Owner copies of the certified letters and return receipts prior to contract award. Neither the State of Tennessee nor any of its departments, agencies, or employees is or will be a party to this Invitation for Bids or any resulting contract(s) awarded by the Owner.

### **SPECIAL NOTICE TO DISADVANTAGED BUSINESS ENTERPRISES (DBE) FIRMS**

All qualified Disadvantaged Business Enterprises (DBE) firms desiring to bid as a General Contractor, sub-contractor, professional service provider, supplier, or equipment vendor are encouraged to contact {Name of the Engineer, office address, and phone number}, in order to obtain a list of prospective bidding General Contractors or to obtain copies of bidding/contract documents.



**Disadvantaged Business Enterprise (DBE) Requirements**  
for  
State Revolving Fund Loans Awarded after May 27, 2008

**GUIDANCE DOCUMENT**

**Items included in the Guidance Document:**

- **General Contract Administration Provisions Table**
- **Six Good Faith Efforts, Purpose and Definitions Table**
- **List of DBE Forms for Loans Awarded After May 27, 2008**

GENERAL CONTRACT ADMINISTRATION PROVISIONS—www.epa.gov			
Requirement	Circumstance	Responsible Party:	Submitted To:
A <b>Loan Recipient</b> must be notified in writing by its <b>Prime Contractor</b> prior to any termination of a <b>DBE Subcontractor</b> for convenience by the <b>Prime Contractor</b> .	Termination of a <b>DBE Subcontractor</b> for convenience by the <b>Prime Contractor</b>	<b>Prime Contractor</b>	<b>Loan Recipient</b>
A <b>Loan Recipient</b> must require its <b>Prime Contractor</b> to pay its <b>Subcontractor</b> for satisfactory performance no more than 30 days from the <b>Prime Contractor's</b> receipt of payment from the <b>Loan Recipient</b> .	<b>DBE Subcontractor's</b> satisfactory performance	<b>Loan Recipient</b> <b>Prime Contractor</b>	<b>DBE Subcontractor</b>
If a <b>DBE Subcontractor</b> fails to complete work under the subcontract for any reason, the <b>Loan Recipient</b> must require the <b>Prime Contractor</b> to employ the <b>Six Good Faith Efforts</b> (see Table below) if soliciting a replacement <b>Subcontractor</b> .	<b>DBE Subcontractor</b> fails to complete work under the subcontract for any reason and will be replaced	<b>Loan Recipient</b> <b>Prime Contractor</b>	<b>SRF Loan Program</b>
A <b>Loan Recipient</b> must require its <b>Prime Contractor</b> to employ the <b>Six Good Faith Efforts</b> (see Table below) even if the <b>Prime Contractor</b> has achieved its fair share objectives.	Employment of the <b>Six Good Faith Efforts</b>	<b>Loan Recipient</b> <b>Prime Contractor</b>	<b>SRF Loan Program</b>
Inclusion, completion, and/or transmittal of required <b>DBE Forms</b> as instructed below: <b>Loan Recipient Requirements</b> <b>Bidder Requirements</b> <b>DBE Participation/Certification Summary</b> <b>Advertisement for Bids and Publisher's Affidavit</b> 10 Certified Letters and Return Receipts to certified <b>DBEs</b> <b>Good Faith Letter</b> <del><b>Prime Contractor's Notice Letter for</b></del> <del><b>EPA Form 6100-2</b></del> <del><b>EPA Form 6100-2</b></del> <del><b>EPA Form 6100-3</b></del> <del><b>EPA Form 6100-4</b></del>	---	<b>Loan Recipient</b> <b>Prime Contractor</b> <b>DBE Subcontractor</b>	See instructions below and on Forms



**Disadvantaged Business Enterprise (DBE) Requirements  
for  
State Revolving Fund Loans Awarded after May 27, 2008**

**GUIDANCE DOCUMENT**

<b>SIX GOOD FAITH EFFORTS—<a href="http://www.epa.gov">www.epa.gov</a></b>	
<b>PURPOSE</b>	The Good Faith Efforts are required methods employed by all EPA financial assistance agreement recipients to ensure that all disadvantaged business enterprises (DBEs) have the opportunity to compete for procurements funded by EPA financial assistance dollars.
<b>Definitions</b>	
<b>EFFORT 1</b>	Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, State and Local and Government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
<b>EFFORT 2</b>	Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
<b>EFFORT 3</b>	Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, State and local Government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
<b>EFFORT 4</b>	Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
<b>EFFORT 5</b>	Use the services and assistance of the Small Business Administration (SBA) and the Minority Business Development Agency of the Department of Commerce.
<b>EFFORT 6</b>	If the <b>Prime Contractor</b> awards subcontracts, require the <b>Prime Contractor</b> to take the steps in the Good Faith Efforts 1 through 5 (above) and in the <u>General Contract Administration Provisions</u> (above).

**Disadvantaged Business Enterprise (DBE) Requirements  
for  
State Revolving Fund Loans Awarded after May 27, 2008**

**GUIDANCE DOCUMENT**

<b>DBE FORMS FOR SRF LOANS AWARDED AFTER MAY 27, 2008—www.epa.gov</b>				
<b>Form</b>	<b>Requirement</b>	<b>Provided By:</b>	<b>Completed By:</b>	<b>Submitted To:</b>
List of certified <b>DBE</b> contractors, subcontractors, supplies vendors, equipment vendors, and service providers	Keep list with project files/information for duration of project	<b>SRF Loan Program</b>	---	---
<b>Loan Recipient's Requirements</b> regarding DBEs	Include this information sheet in the Information for Bidders section of bid documents	<b>SRF Loan Program</b>	---	To be included in the contract specifications book
<b>Bidder's Requirements</b> regarding DBEs	Include this information sheet in the Information for Bidders section of bid documents	<b>SRF Loan Program</b>	---	To be included in the contract specifications book
<b>Loan Recipient's Certification and Summary of DBE Participation</b>	To be completed and submitted with the Authority-to-Award/ Bid Package.  The SRF Loan Program must be notified of any changes, additions, or deletions to the contract during construction.	<b>SRF Loan Program</b>	<b>Loan Recipient</b>	<b>SRF Loan Program</b>
<b>Advertisement for Bids and Publisher's Affidavit</b>	<b>DBE</b> solicitation information must be included in the actual advertisement for bids.  A Publisher's Affidavit (signed, original, notarized certification of publication) denoting the actual published date of the advertisement will be submitted to the SRF Loan Program as part of the Authority-to-Award/Bid Package documents.	An example advertisement with appropriate <b>DBE</b> language is supplied to the Loan Recipient by the <b>SRF Loan Program</b>	<b>Loan Recipient</b>	A copy of the actual advertisement and a Publisher's Affidavit will be submitted to the <b>SRF Loan Program</b> as part of the Authority-to-Award/Bid Package documents
<b>10 Certified Letters and Return Receipts</b> to potential certified DBE subcontractors, supplies vendors, service providers, and/or equipment vendors	These certified letters and copies of the corresponding return mail receipts are submitted with the completed <b>Loan Recipient's DBE Participation and Certification Summary Form.</b>	<b>Prime Contractor and/or Loan Recipient</b>	<b>Loan Recipient</b>	SRF Loan Program as part of the Authority-to-Award/Bid Package documents
<b>Good Faith Letter</b>	If <b>no</b> <b>DBE</b> participation is obtained for the contract, the "Good Faith" letter must be written.	Form letter provided by the <b>SRF Loan Program</b>	<b>Loan Recipient</b>	<b>SRF Loan Program</b>

**Disadvantaged Business Enterprise (DBE) Requirements  
for  
State Revolving Fund Loans Awarded after May 27, 2008**

**GUIDANCE DOCUMENT**

<b>DBE FORMS FOR SRF LOANS AWARDED AFTER MAY 27, 2008—www.epa.gov</b>				
<b>Form</b>	<b>Requirement</b>	<b>Provided By:</b>	<b>Completed By:</b>	<b>Submitted To:</b>
<del>Prime Contractor's Notice Letter for EPA Form 6100-2</del>	<del>The Prime Contractor must submit the Notice Letter to verify that Form 6100-2 was supplied to all DBE Subcontractors participating in the contract.</del>	<del>SRF Loan Program</del>	<del>Prime Contractor</del>	<del>Loan Recipient for inclusion in the Authority-to-Award / Bid / Proposal package</del>
<del>EPA Form 6100-2</del>	<del>Loan Recipient required to have Prime Contractors provide form to DBE Subcontractors</del>  <del>This form gives a DBE Subcontractor the opportunity to describe the work the DBE Subcontractor received from the Prime Contractor, how much the DBE Subcontractor was paid, and any other concerns the DBE Subcontractor might have.</del>	<del>Loan Recipient Prime Contractors</del>	<del>DBE Subcontractors</del>	<del>EPA DBE Coordinator at the conclusion of DBE Subcontractor participation in the project  (Address on Form)</del>
<del>EPA Form 6100-3</del>	<del>Loan Recipient required to have Prime Contractors provide form to DBE Subcontractors</del>  <del>This form captures an intended Subcontractor's description of work to be performed for the Prime Contractor and the price of the work submitted to the Prime Contractor.</del>	<del>Loan Recipient</del>	<del>Prime Contractors DBE Subcontractors</del>	<del>Loan Recipient for inclusion in the Authority-to-Award / Bid / Proposal package</del>
<del>EPA Form 6100-4</del>	<del>Loan Recipient required to have Prime Contractors complete the form</del>  <del>This form captures the Prime Contractor's intended use of an identified DBE Subcontractor and the estimated dollar amount of the subcontract.</del>	<del>Loan Recipient</del>	<del>Prime Contractors</del>	<del>Loan Recipient for inclusion in the Authority-to-Award / Bid / Proposal package</del>

\*\* As referenced in EPA Office of Small Business Programs Memorandum, dated March 8, 2016:

As of March 7, 2016, EPA has suspended use of the following forms associated with the DBE Rule pursuant to 40 CFR 33:

**CONTRACT ADMINISTRATION**

- EPA Form 6100-2, DBE Subcontractor Participation Form
- EPA Form 6100-3, DBE Subcontractor Performance Form; and
- EPA Form 6100-4, DBE Subcontractor Utilization Form

## STATE REVOLVING FUND LOAN PROGRAM

### **Loan Recipient's Requirements for Solicitation and Documentation** **of** **Disadvantaged Business Enterprises (DBE) Participation** on State Revolving Fund (SRF) Projects

A goal-oriented system has been established to promote **Disadvantaged Business Enterprises (DBE)** participation by providing construction services, professional services, supplies, and/or equipment on SRF Loan-funded water and wastewater projects. It is the Loan Recipient's responsibility to ensure that Bidders make a good faith effort during the bidding phase to solicit for subcontractor participation by **DBE** subcontractors, service professionals, suppliers, and/or equipment vendors on all SRF-funded projects.

#### **DEFINITIONS**

**DBE - Minority Business Enterprise (MBE):** A qualified socially and economically disadvantaged minority-owned business certified by any State or Federal agency, such as the Tennessee Department of Transportation, U.S. EPA's Office of Small and Disadvantaged Business Utilization, or the U.S. Small Business Administration.

**DBE - Women's Business Enterprise (WBE):** A qualified independent business at least 51% owned by a woman or women and certified by any State or Federal agency such as the Tennessee Department of Transportation, U.S. EPA's Office of Small and Disadvantaged Business Utilization, or the U.S. Small Business Administration.

**Fair-Share Goals:** The MBE fair-share goal is 2.6% for construction and 5.2% for supplies, services, and equipment. The WBE fair share goal is 2.6% for construction and 5.2% for supplies, services, and equipment.

#### **INSTRUCTIONS TO LOAN RECIPIENTS**

##### **Pre-Bid Requirements**

Loan Recipients must include the SRF Loan Program's "Bidder's Requirements for Solicitation and Documentation of **DBE** Participation on SRF-Funded Projects" information sheet in the Information for Bidders section of bid documents. Loan Recipients must also ensure that Bidders take the following affirmative steps that constitute a good-faith effort to secure **DBE** participation:

- Include certified **DBEs** on solicitation lists whenever they are potential sources,
- Divide construction contracts into subcontracts, when economically feasible, to encourage maximum participation by **DBEs**,
- Establish delivery schedules, where requirements of the work permit, that encourage participation by **DBEs**,
- Use the services and assistance of the Office of Minority Business Enterprises of the U.S. Department of Commerce, or the U.S. EPA's Office of Small and Disadvantaged Business Utilization. For assistance or information, Bidders may be referred to:

Tennessee Department of Transportation  
Small Business Development  
505 Deaderick Street, Suite 1800  
Nashville, TN 37243-0347  
(615) 741-3681

[http://www.tdot.state.tn.us/construction/DBE%20list/dbe\\_list.pdf](http://www.tdot.state.tn.us/construction/DBE%20list/dbe_list.pdf)

Mr. W. Clinton Smith, District Director  
U.S. Small Business Administration  
50 Vantage Way, Suite 201  
Nashville, TN 37228  
(615) 736-5881

<http://pro-net.sba.gov/>

Ms. Jeanette L. Brown, Director  
U.S. Environmental Protection Agency  
Office of Small and Disadvantaged Business Utilization  
1200 Pennsylvania Avenue, N.W. (1230A)  
Washington, D.C. 20460  
(202) 564-4100

<http://www.epa.gov/osdbu/>

#### **POST-BID REQUIREMENTS**

**Whether or not DBE participation was obtained**, the Loan Recipient must complete the "**Loan Recipient's Certification and Summary**" form for every contract detailing whether or not **DBE** participation of subcontractors, professional service providers, suppliers, and/or equipment vendors was obtained. The "**Loan Recipient's Certification and Summary**" form must be submitted to the Administrative Section of the SRF Loan Program prior to the award of any construction contract(s) along with the newspaper **advertisement**, a **Publisher's Affidavit**, and **return receipts** and copies of the **certified letters** that were mailed to a minimum of 10 qualified DBEs.

## STATE REVOLVING FUND LOAN PROGRAM

### **Loan Recipient's Requirements for Solicitation and Documentation** **of** **Disadvantaged Business Enterprises (DBE) Participation** on State Revolving Fund (SRF) Projects

**If DBE participation was obtained**, the “**Loan Recipient's Certification and Summary**” form must clearly indicate whether **DBE** participation was obtained from either a subcontractor, professional service provider, supplier, and/or equipment vendor participation; identify the **DBE** firm(s) to be used; and certify that the **DBE** firm(s) is a certified **DBE**. ~~In addition to the “**Loan Recipient's Certification and Summary**” form, the Loan Recipient must include in the submittal to the SRF Loan Program, copies of the **Prime Contractor's Notice Letter for EPA Form 6100-2, EPA Form 6100-3, and EPA Form 6100-4.**~~

**If no DBE participation was obtained**, the Loan Recipient must submit a separate letter documenting that a “**good-faith effort**” was made to secure **DBE** participation. This letter is submitted along with the above-mentioned “**Loan Recipient's Certification and Summary**” form, newspaper **advertisement**, **Publisher's Affidavit**, **return receipts**, and copies of the **certified letters**. The SRF Loan Program provides a template to the Loan Recipient for this letter.

*This documentation is the only form of documentation that will be accepted by the SRF Loan Program. Failure to provide the required documentation may result in a delay of the SRF Loan Program's approval of the Authority-to-Award/Bid Package, thereby delaying the award of the construction contract(s).*

The Loan Recipient should direct all inquiries regarding the SRF Loan Program's requirements for **DBE** solicitation and documentation to Dr. Bagher Sami at (615) 532-0501, [bagher.sami@tn.gov](mailto:bagher.sami@tn.gov), or the following address:

Dr. Bagher Sami, Manager  
Administrative and Financial Section  
Tennessee State Revolving Fund Loan Program  
WRS - Tennessee Tower, 12th Floor  
312 Rosa L. Parks Avenue  
Nashville, TN 37243

## STATE REVOLVING FUND LOAN PROGRAM

### Loan Recipient's Good Faith Effort Letter for DBE Participation

**(Insert on Loan Recipient's Letterhead)**

**(Date)**

Dr. Bagher Sami, Manager  
Administrative and Financial Sections  
State Revolving Fund Loan Program  
William R. Snodgrass Tennessee Tower  
312 Rosa L. Parks Avenue, 12<sup>th</sup> Floor  
Nashville, TN 37243

RE: Good Faith Effort – Disadvantaged Business Enterprises (DBE) Participation  
**City/County/UD/Authority (?? County), Tennessee**  
**Loan No. SRF/CWA/CGA/DWF/DWA/DGA 20??-???**  
**Contract No. ????, Contract Description**

Dear Dr. Sami:

This letter is to inform you that the **City/County/UD/Authority** did, in good faith, encourage Disadvantaged Business Enterprises (DBE) to participate in the above referenced project by placing a special notice to Disadvantaged Business Enterprises (DBE) firms in both the invitation to bid and the public advertisement for bids. The **City/County/UD/Authority**, through the consulting engineer, **(A/E Consulting Firm)**, sent a copy of the invitation to bid and a set of contract documents to the Office of Minority Business Enterprises. The **City/County/UD/Authority** also sent certified letters, return receipts requested, to a minimum of ten (10) DBE potential subcontractors, professional service providers, suppliers, and equipment vendors requesting DBE participation through their office, A/E, or their contractor. The consulting engineer on this project is **(Name), (Firm)**.

We have not received any DBE participation; we believe we have done a good faith effort.

If you have any questions, please don't hesitate to contact us.

Sincerely,

**(Authorized Representative Name)**

**(Authorized Representative Title)**

cc: **(A/E Consultant Name and Firm)**

# STATE REVOLVING FUND LOAN PROGRAM

## Loan Recipient's Certification and Summary

of

### **Disadvantaged Business Enterprises (DBE) Participation**

SRF Loan Recipient: \_\_\_\_\_ SRF Loan No. \_\_\_\_\_

#### INSTRUCTIONS TO SRF LOAN RECIPIENTS

The SRF Loan Recipient's Authorized Representative must clearly indicate the Contractor's **Disadvantaged Business Enterprises (DBE)** participation results by placing a check in the appropriate box below. The remainder of the form must be completed if **DBE (Minority Business Enterprise-MBE or Women's Business Enterprise -WBE)** participation was obtained. The form must be signed and dated and returned to Dr. Bagher Sami of the Administrative Section of the SRF Loan Program.

The **completed Form** must be accompanied by **copies of the certified letters** sent from the selected Bidder to a minimum of 10 qualified **DBE** potential subcontractors, supplies vendor, services provider, and/or equipment vendors, and **copies of the corresponding return mail receipts**.

The SRF Loan Program must be notified of any changes, additions, or deletions to the contract during construction.

**No, Disadvantaged Business Enterprises (DBE) participation was not obtained for this SRF-funded project.** I certify that a good-faith effort was made to solicit **DBE** participation in accordance with the four affirmative steps outlined in the SRF Loan Program's Requirements for Solicitation and Documentation of **DBE** Participation on SRF-Funded Projects. A letter documenting that a good-faith effort was made to secure **DBE** participation has been provided to the SRF Loan Program.

OR

**Yes, Disadvantaged Business Enterprises (DBE) participation was obtained for this SRF-funded project.** I certify that the **DBE** firms participating in this SRF-funded project are qualified in accordance with the SRF Loan Program's Requirements for Solicitation and Documentation of **DBE** Participation on SRF-Funded Projects. Below is a listing of firms to be utilized and the amounts of their respective participation.

1. **DBE type (circle one):**    Subcontractor,    Supplies Vendor,    Service Provider,    Equipment Vendor  
**DBE Name:** \_\_\_\_\_  
**Address:** \_\_\_\_\_  
**Subcontract Amount:**    \$ \_\_\_\_\_    MBE    \_\_\_    WBE    \_\_\_    % of Contract \$:    \_\_\_\_\_    %
  
2. **DBE type (circle one):**    Subcontractor,    Supplies Vendor,    Service Provider,    Equipment Vendor  
**DBE Name:** \_\_\_\_\_  
**Address:** \_\_\_\_\_  
**Subcontract Amount:**    \$ \_\_\_\_\_    MBE    \_\_\_    WBE    \_\_\_    % of Contract \$:    \_\_\_\_\_    %
  
3. **DBE type (circle one):**    Subcontractor,    Supplies Vendor,    Service Provider,    Equipment Vendor  
**DBE Name:** \_\_\_\_\_  
**Address:** \_\_\_\_\_  
**Subcontract Amount:**    \$ \_\_\_\_\_    MBE    \_\_\_    WBE    \_\_\_    % of Contract \$:    \_\_\_\_\_    %
  
4. **DBE type (circle one):**    Subcontractor,    Supplies Vendor,    Service Provider,    Equipment Vendor  
**DBE Name:** \_\_\_\_\_  
**Address:** \_\_\_\_\_  
**Subcontract Amount:**    \$ \_\_\_\_\_    MBE    \_\_\_    WBE    \_\_\_    % of Contract \$:    \_\_\_\_\_    %

#### PARTICIPATION SUMMARY

**Total SRF Loan Amount:**    \$ \_\_\_\_\_    **Total Construction Contract Amount:**    \$ \_\_\_\_\_  
**Total MBE Participation:**    \$ \_\_\_\_\_    **Total WBE Participation:**    \$ \_\_\_\_\_

\_\_\_\_\_  
Signature and Title of SRF Loan Recipient's Authorized Representative

\_\_\_\_\_  
Date



# STATE REVOLVING FUND LOAN PROGRAM

## Bidder's Requirements for Solicitation and Documentation of **Disadvantaged Business Enterprises (DBE) Participation**

A goal-oriented system has been established to promote **Disadvantaged Business Enterprises (DBE)** participation by providing construction services, professional services, supplies, and/or equipment on SRF Loan-funded water and wastewater projects. It is the Bidder's responsibility to make a good faith effort to secure participation by **DBE** subcontractors, professional service providers, suppliers, and/or equipment vendors.

### DEFINITIONS

**DBE - Minority Business Enterprise (MBE):** A qualified socially and economically disadvantaged minority-owned business certified by any State or Federal agency, such as the Tennessee Department of Transportation, U.S. EPA's Office of Small and Disadvantaged Business Utilization, or the U.S. Small Business Administration.

**DBE - Women's Business Enterprise (WBE):** A qualified independent business at least 51% owned by a woman or women and certified by any State or Federal agency such as the Tennessee Department of Transportation, U.S. EPA's Office of Small and Disadvantaged Business Utilization, or the U.S. Small Business Administration.

**Fair-Share Goals:** The MBE fair-share goal is 2.6% for construction and 5.2% for supplies, services, and equipment. The WBE fair share goal is 2.6% for construction and 5.2% for supplies, services, and equipment.

### INSTRUCTIONS TO BIDDERS

#### Pre-Bid Requirements

All Bidders must send letters by certified mail with return receipt requested to a minimum of 10 certified **DBE** subcontractors, professional service providers, suppliers, and/or equipment vendors to solicit their subcontract participation in the work. Lists of certified **DBE** firms may be obtained from various State and Federal agencies, including the following:

Tennessee Department of Transportation  
Small Business Development  
505 Deaderick Street, Suite 1800  
Nashville, TN 37243-0347  
(615) 741-3681  
<http://www.tdot.state.tn.us/dbedirectinternet/Vendor.aspx>

Mr. W. Clinton Smith, District Director  
U.S. Small Business Administration  
50 Vantage Way, Suite 201  
Nashville, TN 37228  
(615) 736-5881  
<http://pro-net.sba.gov/>

U.S. Environmental Protection Agency  
Office of Small and Disadvantaged Business Utilization  
1200 Pennsylvania Avenue, N.W. (1230A)  
Washington, D.C. 20460  
(202) 564-4100  
<http://www.epa.gov/osdbu/>

#### Post-Bid Requirements

**Whether or not DBE participation was obtained**, the successful Bidder (Prime Contractor) must maintain supporting documents such as certification lists, solicitation documents, letters of intent, contracts, etc., for the duration of the project.

**If DBE participation was obtained**, the apparent successful Bidder must identify to the Loan Recipient all **DBE** firms to be utilized on the contract and the respective **DBE** type--subcontractors, supplies vendors, service providers, and/or equipment vendors (see "Loan Recipient's Certification and Summary" form). Copies of the State's or Federal agency's **DBE** certification list(s) identifying that the **DBE** firms are certified minority or women's business enterprises must be provided to the Loan Recipient. ~~In addition, copies of the **Prime Contractor's Notice Letter for EPA Form 6100-2, EPA Form 6100-3** (to be co-completed by the Prime Contractor and each DBE subcontractor), and **EPA Form 6100-4** must also be provided to the Loan Recipient prior to tentative loan award. The Prime Contractor must provide **EPA Form 6100-2** to each **DBE** utilized on the contract.~~

**If no DBE participation was obtained** by the apparent successful Bidder, it remains the responsibility of the Prime Contractor to provide documentation to the Loan Recipient, prior to contract award, that a good faith effort was made to obtain **DBE** participation. Copies of the **certified letters** sent to a minimum of 10 qualified **DBE** potential subcontractors, supplies vendors, service providers, and/or equipment vendors and the corresponding **return mail receipts** are the only documentation of a good-faith effort that will be acceptable to the Loan Recipient.

*Failure to provide the required certified letters, return receipts, State or Federal agency **DBE** certification list(s), **Prime Contractor's Notice Letter for EPA Form 6100-2, EPA Form 6100-3, and EPA Form 6100-4** to the Loan Recipient may delay the contract award until the required documentation has been provided to and accepted by the Loan Recipient.*



## Certified Disadvantaged Business Enterprises (DBE) List

Using Governor's Diversity Business Office and State DOT and CCR DBE Directories to Find Certified WBEs and MBEs

Here are the links:

<https://tn.diversitysoftware.com/FrontEnd/VendorSearchPublic.asp?TN=tn&XID=1215>

[www.osdbu.dot.gov/DBEProgram/StateDOTDBESites.cfm](http://www.osdbu.dot.gov/DBEProgram/StateDOTDBESites.cfm)

CCR can be used to search for SBA SDBs. Since the SBA SDB certification is considered acceptable under the EPA DBE Program, firms found using the following search criteria can count toward EPA MBE/WBE fair share objectives.

Access the CCR search page at [www.bpn.gov/CCRSearch/Search.aspx](http://www.bpn.gov/CCRSearch/Search.aspx)

[http://www.epa.gov/osbp/dbe\\_team.htm](http://www.epa.gov/osbp/dbe_team.htm)

General Decision Number: TN160135 03/11/2016 TN135

Superseded General Decision Number: TN20150135

State: Tennessee

Construction Type: Heavy  
Including Water and Sewer Line Construction

County: Shelby County in Tennessee.

HEAVY CONSTRUCTION PROJECTS (including sewer/water construction).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of \$10.15 for calendar year 2016 applies to all contracts subject to the Davis-Bacon Act for which the solicitation was issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.15 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2016. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at [www.dol.gov/whd/govcontracts](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date
0	01/08/2016
1	03/11/2016

\* ELEC0474-015 08/03/2015

	Rates	Fringes
ELECTRICIAN.....	\$ 25.70	12.41

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ENGI0369-012 05/01/2013

	Rates	Fringes
Operating Engineers: Bulldozer, Crane, and Forklift.....	\$ 24.47	10.85

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LABO0386-001 05/01/2015

	Rates	Fringes
LABORER: Common or General.....	\$ 17.42	6.05

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SUTN2009-133 12/02/2009

	Rates	Fringes
LABORER: Flagger.....	\$ 8.73	0.00
LABORER: Pipelayer.....	\$ 11.68	0.00

OPERATOR:		
Backhoe/Excavator/Trackhoe.....	\$ 16.82	0.00
OPERATOR: Loader.....	\$ 13.50	0.00
TRUCK DRIVER: Dump Truck.....	\$ 10.76	0.00

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

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The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all

rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor

200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

# EMPLOYEE RIGHTS UNDER THE DAVIS-BACON ACT

## FOR LABORERS AND MECHANICS EMPLOYED ON FEDERAL OR FEDERALLY ASSISTED CONSTRUCTION PROJECTS

THE UNITED STATES DEPARTMENT OF LABOR WAGE AND HOUR DIVISION

### PREVAILING WAGES

You must be paid not less than the wage rate listed in the Davis-Bacon Wage Decision posted with this Notice for the work you perform.

### OVERTIME

You must be paid not less than one and one-half times your basic rate of pay for all hours worked over 40 in a work week. There are few exceptions.

### ENFORCEMENT

Contract payments can be withheld to ensure workers receive wages and overtime pay due, and liquidated damages may apply if overtime pay requirements are not met. Davis-Bacon contract clauses allow contract termination and debarment of contractors from future federal contracts for up to three years. A contractor who falsifies certified payroll records or induces wage kickbacks may be subject to civil or criminal prosecution, fines and/or imprisonment.

### APPRENTICES

Apprentice rates apply only to apprentices properly registered under approved Federal or State apprenticeship programs.

### PROPER PAY

If you do not receive proper pay, or require further information on the applicable wages, contact the Contracting Officer listed below:

or contact the U.S. Department of Labor's Wage and Hour Division.



For additional information:

**1-866-4-USWAGE**

(1-866-487-9243) TTY: 1-877-889-5627



**WWW.WAGEHOUR.DOL.GOV**

# DERECHOS DEL EMPLEADO BAJO LA LEY DAVIS-BACON

## PARA OBREROS Y MECÁNICOS EMPLEADOS EN PROYECTOS DE CONSTRUCCIÓN FEDERAL O CON ASISTENCIA FEDERAL

LA SECCIÓN DE HORAS Y SUELDOS DEL DEPARTAMENTO DE TRABAJO DE EEUU

### **SALARIOS PREVALECIENTES**

No se le puede pagar menos de la tasa de pago indicada en la Decisión de Salarios Davis-Bacon fijada con este Aviso para el trabajo que Ud. desempeña.

### **SOBRETIEMPO**

Se le ha de pagar no menos de tiempo y medio de su tasa básica de pago por todas las horas trabajadas en exceso de 40 en una semana laboral. Existen pocas excepciones.

### **CUMPLIMIENTO**

Se pueden retener pagos por contratos para asegurarse que los obreros reciban los salarios y el pago de sobretiempo debidos, y se podría aplicar daños y perjuicios si no se cumple con las exigencias del pago de sobretiempo. Las cláusulas contractuales de Davis-Bacon permiten la terminación y exclusión de contratistas para efectuar futuros contratos federales hasta tres años. El contratista que falsifique los registros certificados de las nóminas de pago o induzca devoluciones de salarios puede ser sujeto a procesamiento civil o criminal, multas y/o encarcelamiento.

### **APRENDICES**

Las tasas de aprendices sólo se aplican a aprendices correctamente inscritos bajo programas federales o estatales aprobados.

### **PAGO APROPIADO**

Si Ud. no recibe el pago apropiado, o precisa de información adicional sobre los salarios aplicables, póngase en contacto con el Contratista Oficial que aparece abajo:

o póngase en contacto con la Sección de Horas y Sueldos del Departamento de Trabajo de EEUU.



Para obtener información adicional:

**1-866-4-USWAGE**

(1-866-487-9243) TTY: 1-877-889-5627



**WWW.WAGEHOUR.DOL.GOV**

# Project Wage Rate Sheet

U.S. Department of Housing and Urban Development  
Office of Labor Relations

PROJECT NAME:			WAGE DECISION NUMBER/MODIFICATION NUMBER:			
PROJECT NUMBER:			PROJECT COUNTY:			
WORK CLASSIFICATION	BASIC HOURLY RATE (BHR)	FRINGE BENEFITS	TOTAL HOURLY WAGE RATE	LABORERS FRINGE BENEFITS:		\$ TOTAL WAGE
				GROUP #	BHR	
Bricklayers			\$			\$
Carpenters			\$			\$
Cement Masons			\$			\$
Drywall Hangers			\$			\$
Electricians			\$			\$
Iron Workers			\$			\$
Painters			\$	OPERATORS FRINGE BENEFITS:		\$ TOTAL WAGE
				GROUP #	BHR	
Plumbers			\$			\$
Roofers			\$			\$
Sheet Metal Workers			\$			\$
Soft Floor Layers			\$			\$
Tapers			\$			\$
Tile Setters			\$	TRUCK DRIVERS FRINGE BENEFITS:		\$ TOTAL WAGE
				GROUP #	BHR	
OTHER CLASSIFICATIONS						
			\$			\$
			\$			\$
			\$			\$
<b>ADDITIONAL CLASSIFICATIONS (HUD Form 4230-A)</b>						
WORK CLASSIFICATION	BASIC HOURLY RATE	FRINGE BENEFITS	TOTAL HOURLY WAGE RATE	DATE OF HUD SUBMISSION TO DOL	DATE OF DOL APPROVAL	
			\$			
			\$			
			\$			
			\$			



# STATE REVOLVING FUND LOAN PROGRAM

## Bidder's Requirements

### Davis-Bacon Act Wage Determination

**The Loan Recipient must ensure the bidder is in compliance with the Davis-Bacon Act as outlined below. Additionally, ten (10) days prior to the scheduled bid opening date, the wage rates need to be checked to ensure they have not changed.**

The Davis-Bacon Act as amended, requires that each contract over \$2,000 to which the United States or the District of Columbia is a party for the construction, alteration, or repair of public buildings or public works shall contain a clause setting forth the minimum wages to be paid to various classes of laborers and mechanics employed under the contract. Under the provisions of the Act, contractors or their subcontractors are to pay workers employed directly upon the site of the work no less than the locally prevailing wages and fringe benefits paid on projects of a similar character. The Davis-Bacon Act directs the Secretary of Labor to determine such local prevailing wage rates.

The **wage determination** (including any additional **classifications** and **wage rates** conformed) **and** a Davis-Bacon poster (WH-1321) **must be posted on the work site at all times** by the contractor and its subcontractors in a prominent and accessible place where it can be easily seen. The WH-1321 poster **may be obtained at no charge** from offices of the Wage and Hour Division.

With each **pay estimate** submitted, the contractors **must submit** a certification stating that workers have been paid the current prevailing wage rates for each classification according to the Davis-Bacon wage rate schedule currently in effect for this project.

### Wage Determinations

A "wage determination" is the listing of wage rates and fringe benefit rates for each classification of laborers and mechanics which the Administrator of the Wage and Hour Division of the U.S. Department of Labor has determined to be prevailing in a given area for a particular type of construction (e.g., building, heavy, highway, or residential).

### Extensions of Wage Determinations

When a general wage determination has not been awarded within 90 days after bid opening, the head of the contracting/assisting agency may request an extension of the 90 day period from the Wage and Hour Administrator. When, due to unavoidable circumstances, a project wage determination expires before award but after bid opening, the head of the contracting/assisting agency may request an extension of the expiration date of the project wage determination in the bid specifications instead of issuing a new wage determination.

Extension requests should be supported by a written finding including a brief statement of the factual support, that extension of the expiration date of the determination is necessary and proper in the public interest to prevent injustice or undue hardship or to avoid serious impairment in the conduct of Government business.

The Administrator of the Wage and Hour Division of the U.S. Department of Labor will either grant or deny the request for an extension after consideration of all the circumstances, including an examination to determine if the previously issued rates remain prevailing. If a request for the extension of a project wage determination is denied, a new wage determination will be issued to replace an expired project wage determination.

Additional information concerning the Davis-Bacon Act and current wage rate determinations can be obtained at the following sites: [www.gpo.gov/davisbacon/referencemat.html](http://www.gpo.gov/davisbacon/referencemat.html) and [www.wdol.gov/](http://www.wdol.gov/).

# STATE REVOLVING FUND LOAN PROGRAM

## Wage Rate Requirements Under FY 2010 Appropriations

### 3. Contract and Subcontract provisions.

(a) The Recipient shall insure that the subrecipient(s) shall insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project under the DWSRF financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1 or the FY 2010 appropriation , the following clauses:

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, [www.dol.gov](http://www.dol.gov).

(ii)(A) The subrecipient(s), on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

## STATE REVOLVING FUND LOAN PROGRAM

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the subrecipient (s) to the State award official. The State award official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. The subrecipient(s), shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

## STATE REVOLVING FUND LOAN PROGRAM

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the subrecipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or



## STATE REVOLVING FUND LOAN PROGRAM

indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees--

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency

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recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may be appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for

the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and Subrecipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.

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(10) Certification of eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

### **4. Contract Provision for Contracts in Excess of \$100,000.**

(a) Contract Work Hours and Safety Standards Act. The subrecipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such

laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (a)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (a)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The subrecipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a)(1) through (4) of this section.

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(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Subrecipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.



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## Loan Recipient's Requirements

### Davis-Bacon Act Wage Determination

**The Loan Recipient must ensure the bidder is in compliance with the Davis-Bacon Act as outlined below. Additionally, ten (10) days prior to the scheduled bid opening date, the wage rates need to be checked to ensure they have not changed.**

The Davis-Bacon Act as amended, requires that each contract over \$2,000 to which the United States or the District of Columbia is a party for the construction, alteration, or repair of public buildings or public works shall contain a clause setting forth the minimum wages to be paid to various classes of laborers and mechanics employed under the contract. Under the provisions of the Act, contractors or their subcontractors are to pay workers employed directly upon the site of the work no less than the locally prevailing wages and fringe benefits paid on projects of a similar character. The Davis-Bacon Act directs the Secretary of Labor to determine such local prevailing wage rates.

**The specifications must** incorporate a clause stating that the current Davis-Bacon wage rate is required (with the Davis-Bacon links and information).

The Bid Advertisement **must include** a clause that the **Davis-Bacon wage rates** are a requirement. (Refer to the ADVERTISEMENT FOR BIDS EXAMPLE – DBE, ARRA)

If modifications to the existing **wage rates** occur **ten (10) days** prior to the Bid Opening Date, the Loan Recipient **must** incorporate the proper **wage rates** into the plans and specifications by Addendum. All Bidders **must** be informed that this addendum **must** be incorporated into the plans and specifications that they have received.

However, if these modifications occur **less than ten (10) days** prior to the Bid Opening Date, these modifications **shall be effective unless** the agency **finds** that there is not a reasonable time still available before the Bid Opening to notify bidders of the modifications. (A report of this **finding** shall be inserted in the contract file.)

The **wage determination** (including any additional **classifications** and **wage rates** conformed) **and** a Davis-Bacon poster (WH-1321) **must be posted on the work site at all times** by the contractor and its subcontractors in a prominent and accessible place where it can be easily seen. The WH-1321 poster **may be obtained at no charge** from offices of the Wage and Hour Division.

With each **pay estimate** submitted, the contractors **must** certify that workers have been paid the current prevailing wage rates for each classification according to the Davis-Bacon wage rate schedule currently in effect for this project.

The loan recipients **must keep a file** in which all documentation **must be filed** for the current classifications and wage rates (under the Davis-Bacon Act) for the construction of their projects. This file must be kept for three (3) years after the project is completed and **will** be subject to audit by the State of Tennessee and the Environmental Protection Agency (EPA).

### Wage Determinations

A "wage determination" is the listing of wage rates and fringe benefit rates for each classification of laborers and mechanics which the Administrator of the Wage and Hour Division of the U.S. Department of Labor has determined to be prevailing in a given area for a particular type of construction (e.g., building, heavy, highway, or residential).

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## Extensions of Wage Determinations

When a general wage determination has not been awarded within 90 days after bid opening, the head of the contracting/assisting agency may request an extension of the 90 day period from the Wage and Hour Administrator. When, due to unavoidable circumstances, a project wage determination expires before award but after bid opening, the head of the contracting/assisting agency may request an extension of the expiration date of the project wage determination in the bid specifications instead of issuing a new wage determination.

Extension requests should be supported by a written finding including a brief statement of the factual support, that extension of the expiration date of the determination is necessary and proper in the public interest to prevent injustice or undue hardship or to avoid serious impairment in the conduct of Government business.

The Administrator of the Wage and Hour Division of the U.S. Department of Labor will either grant or deny the request for an extension after consideration of all the circumstances, including an examination to determine if the previously issued rates remain prevailing. If a request for the extension of a project wage determination is denied, a new wage determination will be issued to replace an expired project wage determination.

Additional information concerning the Davis-Bacon Act and current wage rate determinations can be obtained at the following sites: [www.gpo.gov/davisbacon/referencemat.html](http://www.gpo.gov/davisbacon/referencemat.html) and [www.wdol.gov/](http://www.wdol.gov/).

## **Wage Rate Requirements Under FY 2010 Appropriations**

### **3. Contract and Subcontract provisions.**

(a) The Recipient shall insure that the subrecipient(s) shall insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project under the DWSRF financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1 or the FY 2010 appropriation , the following clauses:

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in §

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5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, [www.dol.gov](http://www.dol.gov).

(ii)(A) The subrecipient(s), on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the subrecipient (s) to the State award official. The State award official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the

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contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. The subrecipient(s), shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g.,



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the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the subrecipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees--

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or

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with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

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(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may be appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and Subrecipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

### **4. Contract Provision for Contracts in Excess of \$100,000.**

(a) Contract Work Hours and Safety Standards Act. The subrecipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such

laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

## STATE REVOLVING FUND LOAN PROGRAM

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (a)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (a)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The subrecipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a)(1) through (4) of this section.

(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Subrecipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.



# STATE REVOLVING FUND LOAN PROGRAM

## Loan Recipient's and Contractor's Guidance

**FY2010 and After**

### Tracking and Reporting

For tracking and reporting purposes, the **Loan Recipient** is responsible for the following:

- Ensuring that the Contractor is in compliance with the Davis Bacon provisions of ARRA
- The loan recipients **must keep a file** in which all documentation **must be stored** for the current classifications and wage rates (under the Davis-Bacon Act) for the construction of their projects. This file must be kept for three (3) years after the project is completed and **will** be subject to audit by the State of Tennessee and the Environmental Protection Agency (EPA).
- Any additional tracking and reporting requirements from EPA

For tracking and reporting purposes, the **Contractor** is responsible for the following:

- Achieving and maintaining compliance with the Davis Bacon provisions of ARRA
- Submitting with each **pay estimate** a certification stating that workers have been paid the current prevailing wage rates for each classification according to the Davis-Bacon wage rate schedule currently in effect for this project
- Any additional tracking and reporting requirements from EPA

Please contact **Dr. Bagher Sami, Administrative Section Manager for the SRF Loan Program**, at 615-532-0501 or [bagher.sami@tn.gov](mailto:bagher.sami@tn.gov) to obtain details.

# NOTICE

THIS ENTITY IS A RECIPIENT OF **STATE AND FEDERAL FUNDS**. IF YOU HAVE KNOWLEDGE OF ANY ACTIVITY WHICH YOU CONSIDER TO BE ILLEGAL, IMPROPER, OR WASTEFUL, PLEASE CALL THE STATE COMPTROLLER'S TOLL-FREE HOTLINE:

**1-800-232-5454**





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 with multiple sections: Site or Project Name, Street Address or Location, Site Activity Description, County(ies), MS4 Jurisdiction, Existing NPDES Tracking Number, Start date, Estimated end date, Latitude, Longitude, Acres Disturbed, Total Acres, Receiving waters, Attach the SWPPP with the NOI, Site Owner/Developer Entity, Site Owner/Developer Signatory, Mailing Address, Phone, Fax, E-mail, Optional Contact, Title or Position, Owner or Developer Certification, Contractor(s) Certification, Other Contractor company name.

OFFICIAL STATE USE ONLY

Table with 4 columns: Received Date, Reviewer, Field Office, Permit Number TNR, Exceptional TN Water, Fee(s), T & E Aquatic Flora and Fauna, Impaired Receiving Stream, Notice of Coverage Date.

**Notice of Intent (NOI) for General NPDES Permit for Stormwater Discharges from Construction Activities (TNR100000)**

**Purpose of this form** A completed notice of intent (NOI) must be submitted to obtain coverage under the Tennessee General NPDES Permit for Discharges of Stormwater Associated with Construction Activity (permit). **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.** This permit is required for stormwater 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.

**Permit fee** (see table below) 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). There is no fee for sites less than 1 acre.

<b>Acres Disturbed</b>	= or > 150 acres	= or > 50 < 150 acres	= or > 5 < 50 acres	= or > 1 < 5 acres
<b>Fee</b>	\$7,500	\$4,000	\$1,000	\$250

**Who must submit the NOI form?** Per Section 2 of the permit, all site operators must submit an NOI form. “Operator” for the purpose of this permit and in the context of stormwater 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. This person 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 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 only add a contractor (secondary permittee) to an existing coverage.

**Notice of Coverage** The division will review the NOI for completeness and accuracy and prepare a notice of coverage (NOC). Stormwater discharge from the construction site is authorized as of the effective date of the NOC.

**Complete the form** Type or print clearly, using ink and not markers or pencil. Answer each item or enter “NA,” for not applicable, if a particular item does not fit the circumstances or characteristics of your construction site or activity. 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, a map, and the SWPPP.**

**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 geographic information available to describe the location (reference to adjacent highways, roads and structures; e.g. intersection of state highways 70 and 100). Latitude and longitude (expressed in decimal degrees) of the center of the site can be located on USGS quadrangle maps. The quadrangle maps can be obtained at the USGS World Wide Web site: <http://www.usgs.gov/>; latitude and longitude information can be found at numerous other web sites. Attach a copy of a portion of a 7.5 minute quad 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.

**MS4 Jurisdiction:** If this construction site is located within a Municipal Separate Storm Sewer System (MS4), please list name of MS4. A current list of MS4s in Tennessee may be found at [http://www.tn.gov/environment/wpc/stormh2o/docs/MS4s\\_Jan2012.pdf](http://www.tn.gov/environment/wpc/stormh2o/docs/MS4s_Jan2012.pdf)

**Give name of the receiving waters** Trace the route of stormwater runoff from the construction site and determine the name of the river(s), stream(s), creek(s), wetland(s), lake(s) or any other 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 water body that the unnamed tributary enters.

**ARAP permit 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 or permits, contact your local Environmental 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.**

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	540 McCallie Avenue STE 550	37402-2013
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601



**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 WPC 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.**

<b>Site or Project Name:</b>	<b>NPDES Tracking Number: TNR</b>
Street Address or Location:	County(ies):

<b>Name of Permittee Requesting Termination of Coverage:</b>			
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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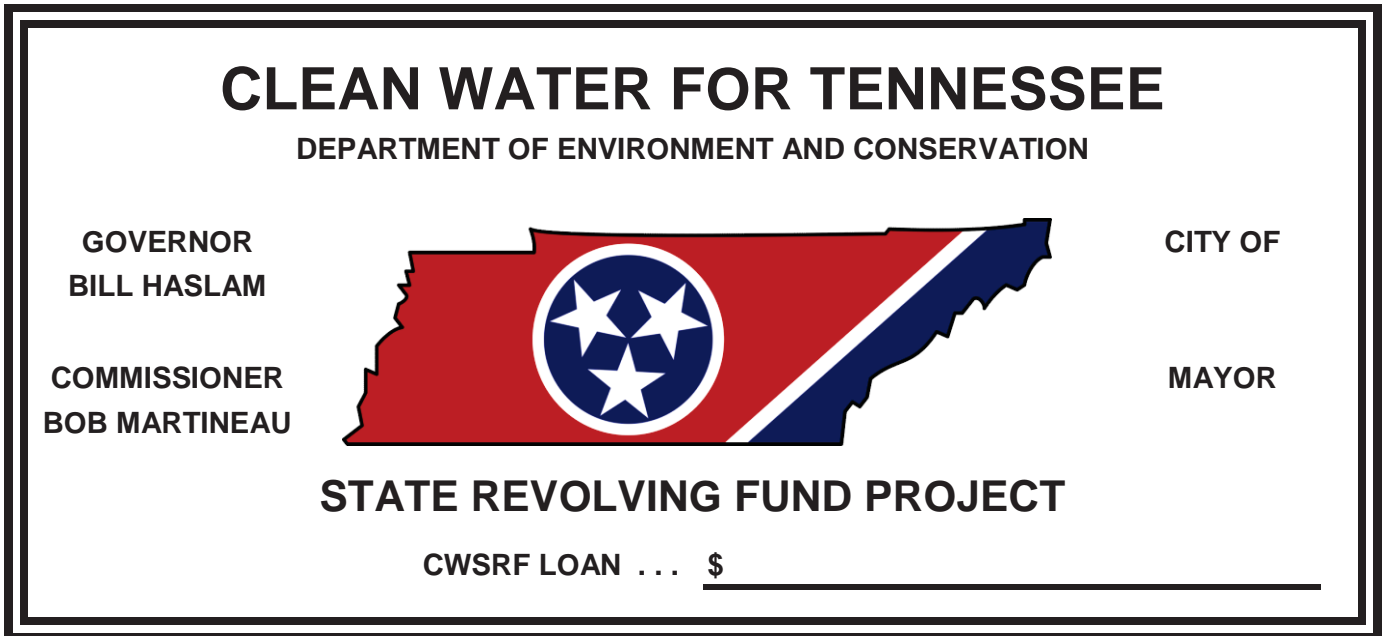
EFO	Street Address	Zip Code	EFO	Street Address	Zip Code
Memphis	8383 Wolf Lake Drive, Bartlett, TN	38133	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305	Chattanooga	540 McCallie Avenue STE 550	37402
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	1421 Hampshire Pike	38401	Johnson City	2305 Silverdale Road	37601

# CLEAN WATER STATE REVOLVING FUND

## IDENTIFICATION SIGN

All plans and specifications for each project approved shall contain provisions for requiring the general contractor to provide identification signs. The signs shall conform to the following basic features:

1. The following diagram shall be used as a design:



2. The sign shall be a 4'0" X 8'0" sheet of exterior grade plywood and shall be built so as to remain erected during the entire construction phase of the project.
3. The background of both sides shall be white. The lettering shall be black and shall be large enough to take advantage of the full size of the plywood. The stars shall be white set on a blue field and surrounded by a white ring placed inside a state map in red with a stripe of white and blue on the right side. The sign shall be bordered by a one-inch blue stripe.

Revised: JANUARY 20, 2011



**STATE REVOLVING FUND LOAN PROGRAM**  
**BID PACKAGE SUBMITTAL REQUIREMENTS**

**PRIOR TO FINAL CONTRACT AWARD** by the State Revolving Fund (SRF) Loan Program, the Loan Recipient must prepare and submit a completed Bid Package to the SRF Loan Program for review and **written approval**. An **Authority-to-Award (ATA)** letter from the SRF Loan Program must be obtained prior to the final contract award and the initiation of construction activities.

A completed Bid Package submittal consists of the following:

1. A copy of the **Advertisement for Bids** appearing in a local or major regional newspaper or the Dodge Report (40 CFR 31.36 (d)(2)(ii)(A)). *The project must be advertised for a minimum of 14 days prior to the bid opening.*
2. An original copy of either the **Award Resolution or the minutes** from the meeting of the governing body (or a certified copy of either) that tentatively awards the contract(s) to the lowest, responsible, responsive bidder(s)
3. A **certified bid tabulation** stamped and signed by the consulting engineer reviewing the bids
4. A copy of the **signed Bid Proposal** of the apparent successful bidder
5. **Equal Employment Opportunity (EEO) documentation** signed by the apparent successful bidder
6. **Bid Bond with Power of Attorney** (40 CFR 31.36(h))
7. Signed and dated U.S. EPA (or other agency) **Contractor Debarment Form**, such as the U.S. Environmental Protection Agency Certification Regarding Debarment, Suspension and Other Responsibility Matters
8. An original, notarized certification of publication (**Publisher's Affidavit**) signed by the editor of the newspaper
9. Copies of a minimum of 10 **certified letters** and "**Return Receipt Requested**" forms sent to potential **Disadvantaged Business Enterprises (DBE)** subcontractors, supplies vendors, service providers, and/or equipment vendors
10. A copy of the current **Davis-Bacon** wage rates used on this project (Davis-Bacon Act)
11. A completed **Loan Recipient's Certification and Summary** of **DBE** Participation on SRF Projects (40 CFR 31.36 (e)(2)(i through vi))
- ~~12. If **DBE** participation was obtained,~~
  - ~~• **Prime Contractor's Notice Letter** for EPA Form 6100-2~~
  - ~~• **EPA Form 6100-3** completed by Prime Contractor and **DBE Subcontractor(s)**~~
  - ~~• **EPA Form 6100-4** completed by the Prime Contractor~~
13. If no **DBE** participation was obtained, a "**Good Faith Effort**" letter (See Good Faith Effort Steps at 40 CFR 31.36 (e)(2)(i through vi))
14. Reference documents:
  - **Loan Recipient's Requirements** for Solicitation and Documentation of **DBE** Participation on SRF Projects
  - **Bidder's Requirements** for Solicitation and Documentation of **DBE** Participation on SRF Projects
  - **Loan Recipient's Certification and Summary** of **DBE** Participation on SRF Loan-Funded Projects
  - **Guidance Document** for **DBE** Requirements for SRF loans
15. If applicable, documentation of the justification for not awarding the contract to the lowest bidder if the award is to be made to a bidder other than the low bidder. The justification must indicate why the low bidder is not responsive or responsible and include documentation of any negotiations leading to the determination.
16. Resume of the resident inspector(s)
17. Documentation of the extension of the bid proposal and bid bond expiration dates, if necessary

**If the lowest bid received exceeds the amount budgeted** for construction in the SRF-approved SRF Loan Budget, the loan recipient must choose only from the following options:

- **Re-allocate** SRF funds through a budget revision. A revised Budget/Re-budget Form must be submitted to the SRF for review and approval if the re-budgeting option is chosen.
- **Provide** additional funds needed to pay the contract from **local funds** or funding source(s) other than the SRF loan
- **Apply** for an **SRF loan increase**. Application for a loan increase will require re-evaluation of the loan recipient's user rates to determine if the anticipated revenues will be sufficient to repay the requested loan increase and fund the additional depreciation. **Principal forgiveness does not apply to loan increases.**
- **Reject** all bids and **re-bid the project**

Please contact Dr. Bagher Sami by telephone at (615) 532-0501 or by e-mail at [bagher.sami@tn.gov](mailto:bagher.sami@tn.gov) if you have any questions concerning the contents of the Bid Package submittal for State Revolving Fund projects.

## City Letter Head

Dr. Bagher Sami,  
Administrative and Financial Section Manager  
State Revolving Fund Loan Program  
William R. Snodgrass - Tennessee Tower  
312 Rosa L. Parks Avenue, 12<sup>th</sup> Floor  
Nashville, Tennessee 37243-1102

RE: Property, Easements, Rights-of-Way Certification  
City/County/UD/Authority (xxxx County or xxx and xxxx Counties), Tennessee  
Loan No. SRF CWA CGA DWF DWA DGA 200x-xxx  
Loan Description: xxxxxxxxxx  
Contract No. / Name 1 of 2—Contract Description  
Contract No. / Name 2 of 2—Contract Description

Dear Dr. Sami:

This letter is to certify that all property, easements, and rights-of-way necessary to construct the projects included in the above-referenced contract are owned (or in the case of right-of-way permitted for the use) by the City/County/UD/Authority. And/or The plant improvements are to be constructed on the same site as our existing facility. Based upon this, no "Site Certificate" is required.

Sincerely,

**Authorized Representative, Title**



## SITE CERTIFICATION

I certify that the applicant, the City of ???, ??? County, the ??? Utility District, the ??? Water/Wastewater/Energy Authority has acquired or has entered into condemnation proceedings for all real property including easements and rights-of-way that are or will be required for the construction (erection, extension, modification, addition), operation, and maintenance of the entire wastewater treatment works funded under loan number SRF/CWA/CGA/DWF/DWA/DGA 200?-???

I certify that any deeds or documents required to be recorded in order to protect the title of the owner and the interest of the City of ???, ??? County, the ??? Utility District, the ??? Water/Wastewater/Energy Authority have been duly recorded and filed for record wherever necessary.

I further certify that real property including easements required for the entire wastewater treatment works project was acquired in accordance with the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and EPA's regulation 40 CFR Part 4.

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

\_\_\_\_\_  
Applicants' Authorized Representative

\_\_\_\_\_  
Title (Mayor, City Manager, Commissioner, etc.)

\_\_\_\_\_  
Attorney (Typed and Signed)

**00672.7 Bid Bond**

Know all men by these presents, that we, the undersigned,  
\_\_\_\_\_ as

Principal, and \_\_\_\_\_ as surety,

Hereby held and firmly bound unto \_\_\_\_\_ as Owner on the sum of \_\_\_\_\_ for the payment of which, well and truly to be made, We hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed this \_\_\_\_\_ day of \_\_\_\_\_, 2016

This condition of the above obligation is such that whereas the principal has submitted to the Purchaser a certain bid, attached hereto and hereby made a part of hereof to enter into a contract in writing for the construction of:

**SARP10 Program 179821.71.0402 Rodney Baber Park Sewer Improvements**

Now therefore,

- A) If said bid shall be rejected, or in the alternative,
- B) If said bid shall be accepted and the principal shall execute and deliver a contract in the form of contract attached hereto (properly completed in accordance with said bid), required insurance certificates, and shall furnish a Bond for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bond,

Then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall, in no event, exceed the amount of this obligation as herein stated.

The surety, for value received, hereby stipulates and agrees that the obligations of said surety and its bond shall be in no way impaired or affected by any extension of the time within which the Purchaser may accept such bid; and said surety does hereby waive notice of any such extension.

In witness whereof, the principal and the surety hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year set forth above.

**CONTRACTOR**

**SURETY**

\_\_\_\_\_  
Contractor's Company Name

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

\_\_\_\_\_  
Signature (principal)

By: \_\_\_\_\_  
Attorney in Fact - Signature

\_\_\_\_\_  
Printed or Typed Name and Title

\_\_\_\_\_



### 00672.8 Schedule Impact Due to Weather

Purchaser will determine Subcontractor's entitlement to an extension of the Work schedule as a result of weather delays, based on the data included in Tables 1 and 2. Extensions of time will be granted at the discretion of Purchaser for circumstances not covered by the flow chart.

The following rules apply to any analysis for weather related delays to this Project. Weather delay days may be awarded if the first two rules are met. Additional days may be awarded if conditions in Rule 3 are met for unusually heavy precipitation independent of Rules 1 and 2.

1. Rule 1: The average monthly precipitation amount must have been exceeded.

If the total amount of actual precipitation in a month exceeds the average for that month shown in Table 1, the first test has been met. Go to rule number 2.  
(Precipitation is defined as the quantity of water deposited by rain, hail, sleet, or snow.)

2. Rule 2: The number of days in a month with actual precipitation greater than the threshold amount shown in Table 2 has been exceeded.

The number of days with actual precipitation greater than the threshold amounts shown in Table 2 are eligible for award as weather delays days.

Additional days may be awarded for unusually heavy precipitation independent of meeting the rules above.

3. Rule 3: Unusually heavy precipitation has occurred.

Precipitation greater than one inch in a single day may be justification for an additional day time extension for each precipitation day. This rule may be applied singly but not in addition with any other rule.

**National Weather Service Data for  
Memphis International Airport – Years 2006-2015**

**Table 1**

Average Precipitation by Month (In Inches)											
Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
4.10	3.51	5.19	5.45	6.11	3.61	3.92	3.06	3.38	3.75	4.29	5.16

**Table 2**

Average Number of Days with Precipitation Greater than 0.25 Inches											
Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
5	4	5	5	5	3	4	3	3	4	4	5

Any weather-related extension of Contract time shall be non-compensable. Efficiencies gained as a result of favorable weather within a calendar month, where the number of days of normally anticipated weather days is less than expected, shall contribute to the project float and shall not affect the Contract Times.

Application for a weather related extension of time shall be submitted to Program Manager, and shall state the extension requested and be supported by the relevant weather data.

## 00672.9 Code of Conduct

### CODE OF CONDUCT FOR GLOBAL BUSINESS RELATIONSHIPS

Black & Veatch Corporation and its subsidiary companies (collectively hereinafter, the "Company") is a global company that conducts business in many countries through subsidiaries, branches, joint ventures, and other business arrangements.

As a responsible corporate citizen, the Company requires that all of its business operations observe certain basic standards of conduct. Also, as a company subject to the laws of the United States, the Company must ensure that its business relationships outside the United States will comply with the requirements of certain U.S. laws that impose on the Company standards of conduct for its business throughout the world.

For all business relationships, it is the policy of the Company that the following standards of conduct and legal requirements shall be observed in every aspect of transactions with the Company:

- 1) Applicable law must be complied with in the conduct of such relationships. If there is a conflict between applicable local law and applicable U.S. law, the guidance of the Company's Law Department will be sought in order to resolve such a conflict. However, the U.S. laws referred to in Paragraphs 4, 5, and 6 below must be complied with without exception.
- 2) The Company, customers, employees, suppliers, and other persons, organizations, and governments will be dealt with in a fair manner with honesty and integrity, observing high standards of personal and business ethics.
- 3) Business books and records will be maintained in a proper, responsible, and honest manner, which will allow the Company to comply with the laws applicable to it.
- 4) All applicable anti-bribery legislation must be complied with, including without limitation, (i) the domestic laws of the country in which operations take place, (ii) the U.S. Foreign Corrupt Practices Act ("FCPA"), (iii) the United Kingdom Bribery Act ("UKBA"), (iv) the national implementing legislation of any relevant jurisdictions under the Organization for Economic Co-operation and Development ("OECD") Anti-Bribery Convention (Convention on Combating Bribery of Foreign Public Officials in International Business Transactions), and (v) any other applicable anti-bribery legislation.
- 5) The laws of the United States regarding boycotts must be complied with.
- 6) The laws of the United States and any other applicable jurisdictions regarding trade sanctions and export administration and control must be complied with for any information or material supplied by the Company.
- 7) Confidential or proprietary information will not be disclosed at any time to persons outside the business relationship without proper authorization.
- 8) Applicable antitrust and competition laws will be complied with.

## 00770 – Loss Control Manual

The Loss Control Manual is available for viewing on the SARP10 website:

<http://www.sarp10.com/facts/>

Contact Riley Thompson, Safety Manager for additional information:

[ThompsonLR@overlandcontracting.com](mailto:ThompsonLR@overlandcontracting.com)

(901) 495-2649



## Technical Specifications

All related maps and drawings are available on the SARP10 website:

<http://www.sarp10.com/projects/>

**CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS**  
**Modified by SARP10 Program**  
**SECTION 01610 – BASIC PRODUCT REQUIREMENTS**

**PART 1 – GENERAL**

1.01 All materials and permanently installed equipment (for example, traffic signalization equipment, sewer pumps, and other such items) furnished by the Subcontractor for the Work shall conform to the requirements of the Plans and Contract Documents, including the applicable City of Memphis Standard Construction Specifications and Design Standards.

1.02 Throughout the entire Project, all units of any one item of installed equipment shall be of the same manufacture and model unless otherwise approved by the Purchaser.

**PART 2 – EQUIVALENT MATERIALS AND EQUIPMENT**

2.01 The General Conditions allows for the substitution of equivalent materials and equipment, with the written approval of the Purchaser.

2.02 Reference to a particular product by manufacturer, trade name, or catalog number establishes the quality standards of materials and equipment required for the Work. It is not intended to exclude products equivalent in quality and similar in design. Whenever any article, material, or equipment is identified by using the name of a manufacturer or vendor, the term “or approved equal” if not inserted shall be implied.

2.03 If the Subcontractor proposes to furnish materials or supplies other than those specified, he shall furnish complete descriptive data, including performance capabilities, specifications, and other data as required in the Contract General Conditions. The provisions of this substitution of materials shall not relieve the Subcontractor of the responsibility of meeting the requirements of the Plans and Contract Documents. All materials must be approved by the Purchaser before any installation will be permitted.

**PART 3 – LIST OF MAJOR EQUIPMENT AND MATERIALS**

3.01 The Subcontractor shall submit to the Purchaser for approval, with due promptness after award of Contract but in no case later than at the preconstruction conference, a list of major equipment and materials which he proposes to provide. The list shall include in sufficient detail to identify the materials, the name of the manufacturer’s model number of all material that is identified on the Plans or in the Contract Documents, including catalog literature for standard equipment and detailed scale drawings of any nonstandard or special equipment and of any proposed deviation from the Plans. A signed statement shall accompany this list stating that materials and equipment are in exact accordance with Project specifications. No charge shall be made to the Purchaser for any materials or equipment purchased, labor performed, or delay to the Work prior to approval of materials by the Purchaser.

**PART 4 – SOURCE OF SUPPLY**

4.01 The source of supply for each material to be supplied by the Subcontractor shall be subject to approval by the Purchaser before delivery is started.

**PART 5 – SAMPLES AND TESTING**

5.01 Representative samples of materials included for incorporation in the Work shall be submitted to the Purchaser for his examination and/or testing when so specified or requested.

5.02 All testing of materials shall be made in accordance with the standard methods of testing of the ASTM, AASHTO, NEMA, ITE, or other applicable standard specifications.



**CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS**  
**Modified by SARP10 Program**  
**SECTION 01610 – BASIC PRODUCT REQUIREMENTS**

**PART 6 – PROPOSAL QUANTITIES**

6.01 The quantities appearing in the Proposal Sheet(s) of the Proposal are approximate and are proposed and shown for the comparison of bids and award of a Contract. The Purchaser does not guarantee or assume any responsibility that the quantities indicated on the Plans or in the Proposal will hold true and accurate in the construction of the Project. The Subcontractor shall not plead deception or misunderstanding because of variation from these quantities. Unless otherwise provided in the Contract Documents, payment to the Subcontractor will be made only for the actual quantities of Work performed and accepted, and materials and equipment furnished and placed in accordance with the Contract. The Subcontractor is reminded of the limitation provided by Section 838 of the Charter of the City of Memphis which limits the total amount of the increase in the Contract Price, for any reason, to ten (10) percent of the original Contract award amount. There are no specific limitations on the amount by which the Contract Price and project quantities may be decreased.

**PART 7 – MEASUREMENT**

7.01 Measurement of Quantities

- A. All Work completed under the Contract will be measured by the Purchaser according to United States standard measure.
- B. The term “ton” will mean the short ton consisting of 2,000 pounds avoirdupois.
- C. The determination of quantities for specific items will be made as set for the in the subsection titled “Measurement” under the applicable Sections of the Standard Construction and Material Specifications hereof, or of other Specifications provided for the Work.
- D. Longitudinal and transverse measurements for surface area computations will be to the exact dimensions shown in the horizontal plane on the Plans or as ordered in writing by the Purchaser.
- E. Structures will be measured according to the lines and exact dimensions shown on the Plans or as altered to fit field conditions by direction to the Purchaser.
- F. In all cases where measurement of materials is based on certified weights, the Subcontractor shall furnish the Purchaser certified weigh bills showing the net weight of materials received in each shipment. In no instance will the Purchaser pay for materials in excess of the amounts represented by the certified weigh bills.
- G. When certified scale weights are not used for measurement, all materials which are measured or proportioned by weight shall be weighed on accurate, approved scales, by competent, qualified personnel, at locations designated by the Purchaser.
- H. Trucks used to haul material being paid for by weight shall be weighed empty at such times as the Purchaser directs, and each truck shall bear a plainly legible identification mark.
- I. Measurements for payment will be made to the nearest fractional units specified below, unless otherwise specified herein or in the Contract Documents for the project.

<u>Unit of Measurement</u>	<u>Nearest Unit</u>
Linear Foot	0.1 LF
Square Foot	0.1 SF
Square Yard	0.1 SY

**CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS**  
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**SECTION 01610 – BASIC PRODUCT REQUIREMENTS**

Ton	0.1 Ton
Cubic Yard	0.01CY
1,000 SF Unit	0.1 Unit

**END OF SECTION 01610**

## **SPECIAL CONDITIONS**

### **I. SCOPE OF THE CONTRACT:**

- A. The work required under this Contract includes furnishing and paying for all necessary materials, labor, tools, equipment, and other items and construction improvements of the Rodney Baber Park Sewer Improvements, complete in every detail, ready for the Purchaser's beneficial use as specified herein and/or indicated on the contract drawings. The project shall consist of, but is not limited to, the following items:
1. Installation of approximately 2000 linear feet of new 12 inch diameter sanitary sewer ductile iron pipe (DIP) and polyvinyl chloride (PVC) pipe, approximately 480 linear feet of new 24 inch diameter sanitary sewer Glass Fiber Reinforced Polymer Mortar Pipe, new sanitary sewer manholes, and 12 foot diameter concrete junction box (doghouse manhole) over existing 84 inch gravity sewer line. Also included is the post construction assessment of all new pipes and manhole structures. The assessment includes manhole assessment as well as closed-circuit television (CCTV) or sonar inspection inspections for all pipe diameters. Other related work includes abandoning existing sanitary sewer pipes, bypass pumping, a new sewer tap and service line, restoring the disturbed area, and erosion control.

### **2. MODIFICATIONS AND ADDITIONS TO TECHNICAL SPECIFICATIONS:**

- A. In the event of conflict between the TECHNICAL SPECIFICATIONS, Construction Drawings, the General Provisions or Special Conditions contained herein, and/or product manufacturer's specifications the more stringent shall apply. However, all conflicts shall be brought to the attention of the INSPECTOR for approval.
- B. The cost of all required material inspections and testing, including, but not limited to earthwork and concrete testing, shall be paid for by the CONTRACTOR.
- C. Item No.03310-01, Reinforced Concrete Junction Box (Doghouse Manhole):
1. This item is not specified in the TECHNICAL SPECIFICATIONS.
  2. Reference: Section 03310 – Concrete Structures
  3. Where Doghouse manholes are indicated on the drawings to be constructed over existing sewers, the existing sewer pipe shall be left undisturbed and the flow maintained through it until the manholes has been completed and accepted or until the receiving facility to where the flow is being diverted is ready to accept the flow. Unless otherwise

specified, required or ordered by the Engineer, the Contractor shall carefully excavate around and properly support the existing sewer pipe. On completion and acceptance of the Doghouse manhole, the top portion of the existing sewer pipe shall be carefully removed and the flow channel formed to the limits and in accordance with the details (City of Memphis, Civil Details, Reinforced Concrete Junction Box) shown on the drawings.

4. Where a cast-in-place base section is used, the top of the base section shall have a ring-formed joint cast or formed in the section which shall be compatible with the corresponding precast manhole riser sections.
5. Where doghouse manholes are used, the base slab may be cast-in-place or precast and shall have reinforcing bars extending into the concrete fill used for the flow channel and bench. The doghouse manhole section shall have openings provided by the manufacturer to fit over the existing pipe(s). The opening around the existing pipe(s) shall be sealed with concrete when forming the flow channel to the top of the bench and the remaining opening above the bench with concrete or brick and mortar.
6. Payment will be at the contract unit price for installation of each Concrete Junction Box (Doghouse Manhole), which shall include all material and labor necessary to complete the item as shown on the plans.

D. Item No. 02530-02, Silt Fence

1. This item is not specified in the TECHNICAL SPECIFICATIONS.
2. Job Conditions
  - A. Excavation, trenching, backfilling, and grading operations to elevations as needed to meet the requirements shown on the Contract Documents, shall be done in such a manner as to cause the least amount of soil erosion and siltation.
  - B. Appropriate management practices and control structures shall be in place prior to clearing of vegetation for necessary construction activities near streams, rivers, and lakes.
  - C. Provisions required to maintain uninterrupted surface water flow shall be maintained during the work. Storm water flow in existing gutters, surface drains, and swales shall not be interrupted.
  - D. The Engineer shall be notified of any unexpected subsurface or other unforeseen conditions. Work shall be discontinued until the Engineer provides notification to resume work.
3. Preparation
  - A. Erosion and sediment control shall be in accordance with the Tennessee Water Quality Control Act of 1977, as amended, and the Federal Act PI 92-59.
  - B. The Tennessee Department of Conservation Publication, Tennessee Erosion & Sediment Control Handbook, latest revision, shall be used as a guide for construction of projects that require erosion and sediment controls to protect adjoining property and waters of the state.

4. Performance

- A. Whenever possible, a buffer strip of vegetation cover shall be kept adjacent to grading operations.
  - B. Control measures shall be in place and functional before earth moving operations begin, and must be properly constructed and maintained during the construction period.
  - C. Staked and entrenched straw bales or silt fence shall be installed along the base of all sloped cuts and fills, on the down hill sides of stockpiled soil, and along stream banks.
  - D. All surface water flowing toward the construction area shall be diverted around the area as much as possible to reduce erosion potential by using beams, channels, and/or sediment traps as necessary.
  - E. Maintenance of erosion and sediment control methods shall be performed on a regular basis throughout the construction period and until a good vegetative cover is established over the entire disturbed area.
  - F. A vegetation buffer strip shall be maintained between any stream and pipe trenching. Excavated material from the trench shall not be placed between the trench and stream.
  - G. Trenches or pits shall be backfilled as soon as practicable to reduce erosion potential.
  - H. Erosion control measures shall be removed when they have served their useful purpose. The disturbed soil shall be fine graded, top soiled, and planted with permanent vegetation as soon as the construction sequence allows to prevent further potential erosion and sedimentation. Any seeded areas which are eroded shall be reworked as soon as possible.
5. Payment will be at the contract unit price for installation per linear foot (L.F.) silt fence, which shall include all material and labor necessary to complete the item as shown on the plans

E. Item No. 02531-03, Existing Manhole Core & Boot

1. Core-drill circular opening in manhole wall of diameter to fit the required boot size.
2. Kor-n seal flexible rubber boot (manufactured by National Pollution Control Systems, Inc. or as approved by the engineering department) shall be used for watertight connection.
3. Cut, shape and slope new invert channel in the existing concrete bench for smooth flow from new sanitary sewer connection.
4. Clean existing manhole of any dirt, concrete or debris which may accumulate during the construction process.
5. Payment will be at the contract unit price for installation of each existing manhole core and boot, which shall include all material and labor necessary to complete the item as shown on the plans.

**CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS**  
**SECTION 00001 - MANHOLE GPS & MACP INSPECTION**

**PART 1 – SCOPE**

- 1.01 This Work will consist of locating sanitary sewer system facilities, gathering sub-meter grade GPS coordinates of manhole (including lamphole) covers, Manhole Assessment Certification Program (MACP) protocol Level 1 and Level 2 manhole inspections using the National Association of Sewer Service Companies (NASSCO) MACP Version 6.0.1 protocols, associated photographs, camera inspection of manholes and the associated pipe connections, and documentation of manholes not found, not on grade and/or not showing. Manholes to be located, documented and inspected are in both improved streets, arterial and primary roads, backyards and unimproved easements. Once new manhole coordinates are obtained, the updated source GIS map data shall be delivered to Program Manager (from hereon Program Manager shall be interpreted as “Program Manager or his designee”) in order to reflect the actual sewer system network.

The Work covered by this section includes furnishing all labor, competent MACP certified technicians/crew leads, equipment, tools, accessories, and materials required to GPS, perform MACP Level 1 and Level 2 inspections, conduct camera inspections and document the specified manholes.

- 1.02 Sub-meter GPS coordinates, updated GIS map data, Levels 1 and 2 MACP data and records, and camera inspection photos of the manholes shall be delivered to the Program Manager on clearly labeled external hard drive(s) which will become property of the Program Manager. Inspection data for any one asset shall not be split between multiple drives. MACP data files shall be formatted to facilitate upload into a MACP Exchange Database or internet upload to an FTP site as approved by the Program Manager.
- 1.03 Selected Contractor(s) will be provided two Geo-databases; one will have supporting records (aerial photo overlays, outfall and block maps and as-builts, as available), and a maiden database which will include the asset ID for each manhole.

**PART 2 - MATERIALS AND EQUIPMENT**

2.01 MATERIALS

A. Submittals

1. Unless otherwise specified, all sample submittals shall be delivered to the Program Manager within two weeks of the NTP.
2. A Traffic Control Plan shall be submitted to the Program Manager, including the following items:
  - a. Outline of permit acquisition procedure for lane closures.
  - b. Methods for proper signing and barricades, which comply with local requirements and the City.
  - c. Major streets (e.g. Shelby County Principal Arterial & Minor Arterial) requiring a City approved permit if taking a lane for mobile operations, secured through Traffic Control Plan submittal to the City and signed by a TN P.E. The City requires a two-week lead time for permit processing.
    - i. The Contractor will be required to deliver a sample primary/arterial road Traffic Control Plan for review by the City.

**CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS**  
**SECTION 00001 - MANHOLE GPS & MACP INSPECTION**

- ii. If the City determines that the nature of the work operation or the type of road in which the Contractor is working requires a permit, the Contractor will be required to modify the sample Traffic Control Plan to obtain a permit from the City.
  - d. For everywhere else where a permit is not required, the Contractor shall develop, provide, and implement a Traffic Control Plan for all mobile operations in accordance with standard MUTCD specifications.
  - e. The Contractor is also responsible for acquiring all necessary disposal and/or landfill site permits required to perform this work.
  - f. Railroad Rights of Way: The Contractor shall notify the Program Manager when work or access to manholes and sanitary sewers lie within the 25 feet railroad easement, as measured by 25 feet outside the nearest rail of the tracks. To access sewer facilities within the 25 feet of the railroad right of way, the Contractor shall contact 48 hours in advance the Program Manager, who will alert the City's Zone Construction Inspector to coordinate individual railroad direction and guidance.
3. Site Contractors emergency phone numbers.
4. Schedules of work on a weekly basis that will be delivered no later than 2:00 PM on Thursday for the week following, and daily AM email updates of approximate crew locations each day.
- a. Weekly schedule format shall contain the following elements:
    - i. Map format.
    - ii. Sufficient streets labeled and identified at a scale to provide clarity.
    - iii. Nature and type of crew location by map area.
5. Permit required confined space entry plans in compliance with the Loss Control Manual.
6. GPS calibration standards, including frequency, are to be followed in the field; specify which available base stations will be used for the work.
7. Sample of sub-meter GPS coordinates delivered in electronic and pdf format.
8. Copies of NASSCO certifications for all field staff conducting MACP Levels 1 and 2 inspections.
9. Sample of MACP Level 1 and Level 2 documentation logs (with photo documentation comments and photos properly referenced) in MACP formats, in both electronic and pdf format.
10. Equipment list, including GPS and camera manufacturer and model equipment to be used.
11. Sample of the GPS coordinate delivery in an ESRI ArcPAD .axf file format.
12. Sample of the digital inspection data delivery in MS ACCESS database format.

**CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS**  
**SECTION 00001 - MANHOLE GPS & MACP INSPECTION**

2.02 EQUIPMENT

- A. All equipment used for the gathering of GPS coordinates, collection of condition assessment information, and digital camera inspection of manholes shall be specifically designed and manufactured for the purpose intended under this Contract. The software and hardware for the electronic capture of the inspection defect observations must be consistent with NASSCO's MACP Level 1 and Level 2 requirements for the collection of data. ESRI ArcPad 10.1 is required for GPS data collection and GIS map updates for manhole / lamphole facility locations. Export of the electronic inspection data to an MACP format Microsoft ACCESS database for analysis is required.
- B. The Contractor shall submit an equipment list to the Program Manager for approval before the commencement of the Work and shall certify that back-up equipment is available and can be delivered to the worksite in 72 hours.

1. GPS Equipment

- a. Equipment shall be sub-meter grade, Trimble Pro Series Receivers with Floodlight technology capability, Top Con GRS-1 Series equipment or equal (to be approved by Program Manager prior to mobilization). GPS coordinates to be real-time or post-processed to achieve sub-meter accuracy. Equipment must have ESRI ArcPad 10.1 installed for use in data acquisition.

2. Camera

- a. All cameras used shall be digital format color cameras specifically designed or modified for use in sewer manhole inspection work. All cameras used during inspections shall have a minimum of 5 mega pixels .jpg format for sufficient clarity and detail in the photos, and photos of at least 2MB shall be submitted. The cameras shall be operable in 100 percent humidity conditions. The cameras shall be high-resolution cameras with wide viewing angle lenses and either automatic or remote focus and iris controls. Camera lighting shall be sufficient for use with digital color inspection cameras and for the manhole diameters and pipe connection diameters identified in the contract.
- b. The following photo sequence is specified: Photo 1- surface view photos taken of the manhole should include a whiteboard (or similar) with the manhole ID number identified on it. The photographer should be standing with the outlet pipe facing their 6 o'clock position. Photo 2 - the downhole photo of the manhole channel should be taken with the outlet pipe facing their 6 o'clock position. Additional photos as specified by MACP guidance.
- c. Inadequate lighting, image distortions, blurry or murky images, low resolution, dirty lens and/or other quality issues will be a cause for rejection. If unsatisfactory, Contractor shall perform work until deliverable is of acceptable quality. No payment will be made for unsatisfactory inspections or until product is accepted.

3. Data Logger and Software



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**SECTION 00001 - MANHOLE GPS & MACP INSPECTION**

- a. MACP and camera inspections and logs created and captured electronically during the MACP inspection of the manhole through the use of commercially available electronic data loggers are required. Paper records for data collection in the field shall not be used. NASSCO MACP protocols shall be used for capturing and recording the observations.
  - b. The data logger equipment and software shall allow Program Manager direct access to the captured electronic data, and provide for export of the data in accordance with MACP formats and standards.
4. Retrieval of Stuck Equipment
- a. The Contractor is responsible for hiring a licensed sub-contractor to retrieve any equipment that becomes lodged in the sewer system through the execution of the scope of work (fallen cameras, jet nozzles, inflatable plugs, sandbags etc.) at the Contractor's own cost. Such retrieval by an appropriately licensed sub-contractor shall be made within 72 hours to avoid interfering with the City of Memphis sewer system operations. Any and all impacts and related costs due to the Contractor's equipment in the line shall be the responsibility of the Contractor.

**PART 3 – CONSTRUCTION REQUIREMENTS**

3.01 INSPECTION

A. GPS Coordinates of Manhole Cover

1. Program Manager will provide Contractor with a digital copy of the original GIS source map indicating the sewer system network compiled from existing City records.
2. The Contractor shall capture and record sub-meter grade x, y and z coordinates of each manhole cover identified in the original GIS maiden data map provided with a unique asset identification (ID) number. Additional sanitary sewer lamp hole and manholes found in the field in the course of the inspection work that are not provided in current mapping nor identified with a current unique asset ID shall be documented and GPS coordinates shall be recorded. A provisional manhole asset ID number shall be used by the Contractor by adding a dash and a two-character number to the closest upstream manhole ID.
3. Record sub-meter GPS coordinates in NAD83 TN State Plane Coordinates horizontal, NAVD88 vertical in US Survey feet using properly-calibrated GPS equipment. If GPS coordinates cannot be obtained due to buildings, trees or cloud cover, Contractor shall note this on the inspection form and return at least one additional time at a different time of day or under different sky cover. If both attempts fail at securing the sub-meter coordinates, this is to be documented and reported in the submittal. Land surveying shall not be required where GPS is not available.
4. The Contractor shall be expected to use all reasonable means to locate the lampholes and manholes in the field. This includes walking the pipeline alignment, using measuring tapes or wheels from the last found manhole, using metal detectors, or other means. If manholes are not able to be found and documented or unknown manholes are found, record the reasons for not locating or not opening the manhole or the specifics of the new manhole found, and submit with supporting MACP documentation to the Program Manager daily.

**CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS**  
**SECTION 00001 - MANHOLE GPS & MACP INSPECTION**

5. Once GPS coordinates are obtained for known and newly discovered facilities, the original GIS map data shall be delivered to the Program Manager to reflect the actual sewer system network for the assigned inspection area.
6. The Contractor shall revisit predefined GPS control locations near project area at least one time per day per each GPS unit used as a quality control check on GPS accuracy. Contractor is to document these checks on a single log, which shall be kept on file for the duration of the project, and shall be released to Program Manager on a weekly basis.

**B. MACP MH Inspection**

1. The Contractor shall document and record each sanitary sewer manhole inspection in MACP Level 1 format for lampholes and Level 2 format for manholes with supporting completed MACP format database. The complete NASSCO MACP Levels 1 and Level 2 protocols must be utilized for the lamphole and manhole inspections respectively, and must be associated in the electronic database and pdf documentation with the unique asset ID provided.
2. The Contractor shall mark the direction of wastewater flow (one arrow per pipe) in and out of the manhole around the perimeter of the manhole cover on the street with discrete green arrows spray painted onto the road surface using a guide or template for the arrows. The arrows shall be a minimum of 12 inches and a maximum of 18 inches in length.
3. The Contractor shall follow the prescribed MACP Level 1 and Level 2 procedures and use the required nomenclature and formats to document the manhole interior and exterior conditions and defects.
4. Contractor shall be responsible for cleanup, repair, fines, property damage costs, and claims for any sewage backup, spillage or sanitary sewer overflow during or as a result of the field operations.

**C. Camera Inspection of Manholes and Associated Pipe Connections**

1. Digital camera inspection of manholes shall be completed in conjunction with Level 2 manhole inspections of defects and include each sewer pipe connection in the manhole. The photo record of the inspection shall document defects and leaks and shall include a photo record of the connecting pipes in each manhole. Abbreviations, naming conventions, and numbering conventions shall be documented in MACP formats. For photo image quality reference back to Section 2.02.B.1.
2. File naming must be consistent. Additional instructions, naming conventions, file structures, etc. will be provided after contract award.

**D. Meetings**

1. The Program Team will arrange bi-weekly (every other week) meetings with the contractor to discuss data management and quality, and field issues.

**CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS  
SECTION 00001 - MANHOLE GPS & MACP INSPECTION**

**PART 4 – DELIVERABLES**

4.01 RECORDS

A. GPS Manhole Cover Coordinates

1. Contractor's Level 1 Lamphole and Level 2 Manhole GPS coordinate delivery to the Program Manager shall be in an ESRI ArcPAD .axf file format. The updated GIS source map data reflecting the actual sewer system network shall also be delivered. Inspection data is to be delivered to the Program Manager by the close of business on the Monday following a week after data acquisition. Subsequent data will not be accepted if GPS data is not obtained and delivered at the same time as inspection is conducted. The requested GPS control check file (MS EXCEL) shall also be delivered at this time.

B. Level 1 and Level 2 Inspection Documentation

1. Deliver complete MACP Level 1 for lampholes and Level 2 inspections for manholes in MACP electronic database and pdf electronic formats on an external hard drive. Delivery will be in MS ACCESS database format unless otherwise preapproved by the Program Manager. Inspection data is to be delivered to the Program Manager by the close of business on the Monday following a week after data acquisition.

C. Camera Inspection Documentation

1. Include specified camera photo documentation of defects, leaks and pipe connections in the MACP Image reference field as appropriate, for the Level 2 documentation. Inspection data is to be delivered to the Program Manager by the close of business on the Monday following a week after data acquisition.

D. Manhole Reports

1. Deliver a summary report in PDF format of each manhole inspected. The report will include all MACP Level 1 & Level 2 data collected for the manhole. The report shall include the surface view photo of the manhole with the outlet pipe facing 6 o'clock as well as a downhole photo of the channel with the outlet pipe at 6 o'clock. Any defects noted in the manhole shall also have an accompanying photo in the report.

E. Draft Report and Final Report

1. In addition to the electronic database and pdf format reports, three copies of the Draft Report will contain hard copies of each of the MACP inspections with camera manhole defect and pipe connection photographs. The MACP compliant database of the inspections in ACCESS format shall also be submitted to the Program Manager electronically on an external hard drive.
2. Draft Report shall be delivered to Program Manager within fifteen working days of the last or final inspection. The Program Manager will have a two workweek period to review and provide comments to the Contractor. The Contractor shall address all comments and submit the Final Report within one workweek from receipt of comments. At the Program 3. Manager's discretion, a meeting will be

**CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS**  
**SECTION 00001 - MANHOLE GPS & MACP INSPECTION**

held upon submittal of the Final Report to have the Contractor go over the processes used to address comments.

F. Quality

1. Rejection of deliverables will be submitted to the Contractor via the Program Team in a written communication discussing issues that must be addressed. The Contractor will be required to follow up with a response within three business days upon receipt of the written communication. Contractors will have seven (7) calendar days from the rejection notice date to make the necessary corrections and resubmit the data deliverable in its entirety.

**PART 5 – MEASUREMENT**

5.01 GPS COORDINATES OF MANHOLE COVER

- A. The capture and associated documentation of sub-meter GPS x, y and z coordinates for each lamphole and manhole cover will be measured for payment per each lamphole and manhole located by GPS and its coordinates recorded in accordance with the specification, provided that documentation meets QA/QC standards.

5.02 MACP LEVEL 1 FOR LAMPHOLE INSPECTIONS

- A. The inspection and recording of all lamphole observations in a MACP compliant fashion will be measured for payment per each lamphole inspected in accordance with the specification.

5.03 MACP LEVEL 2 FOR MANHOLE INSPECTIONS

- A. The inspection and recording of all manhole observations in a MACP compliant fashion will be measured for payment per each manhole inspected in accordance with the specification.

**PART 6 – PAYMENT**

6.01 GPS COORDINATES OF MANHOLE COVER

- A. The capture and associated documentation of sub-meter GPS x, y and z coordinates for each manhole cover shall be paid for at the unit price bid for each lamphole and manhole cover coordinates documented and recorded in accordance with the specification provided that QA/QC standards are met.
- B. The unit price for each manhole cover GPS set of coordinates shall cover the entire cost of the GPS equipment and time necessary to gather the coordinates, including but not limited to calibrating the equipment; setup and access; traffic control; documenting results in prescribed MACP electronic formats, records and logs; power supply for equipment; interim and final reports; and all other appurtenant work.
- C. No additional payment will be made for:
  1. Location or re-inspection due to cars parked over manholes or other impediments to on grade and showing manhole covers.
  2. Additional visit(s) to secure the proper GPS coordinates due to lack of adequate satellite coverage or reception.
  3. Unapproved duplication of inspections: The contractor/subcontractor is responsible to ensure duplications do not occur.

**CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS**  
**SECTION 00001 - MANHOLE GPS & MACP INSPECTION**

6.02 MACP LEVEL 1 FOR LAMPHOLE INSPECTIONS

- A. The inspection and recording of all lamphole observations in a MACP format shall be paid for at the unit price bid per each MACP Level 1 inspection performed in accordance with the specification, provided that QA/QC standards are met.
- B. The unit price for each MACP lamphole inspection shall cover the entire cost of the inspection and reporting, including but not limited to setup and access, documenting results in records and logs, power supply for equipment, interim and final reports and all other appurtenant work.

6.03 MACP LEVEL 2 FOR MANHOLE INSPECTIONS

- A. The inspection and recording of all manhole observations in a MACP format shall be paid for at the unit price bid per each MACP Level 2 inspection performed in accordance with the specification, provided that QA/QC standards are met.
- B. The unit price for each MACP manhole inspection shall cover the entire cost of the inspection and reporting, including but not limited to setup and access, documenting results in records and logs, digital photos, power supply for equipment, interim and final reports, and all other appurtenant work.

6.04 PAYMENT WILL BE MADE UNDER:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
00001-6.01	GPS COORDINATES OF MANHOLE COVER	EACH
00001-6.02	MACP LEVEL 1 LAMPHOLE INSPECTIONS	EACH
00001-6.03	MACP LEVEL 2 MANHOLE INSPECTIONS	EACH

**END OF SECTION 00001**

**CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS**  
**SECTION 00003 - CLOSED CIRCUIT TELEVISION INSPECTION**  
**OF SEWER MAINS&CONNECTIONS**

**PART 1 – SCOPE**

- 1.01 This Work will consist of cleaning and Pipeline Assessment Certification Program (PACP) internal closed circuit television (CCTV) surveys to digitally inspect and record conditions of existing sanitary sewer mains and connections. Sewer pipes and connections to be inspected are located in both improved streets, arterial and primary roads, backyards and unimproved easements.
- 1.02 The Work covered by this section includes furnishing all labor, competent PACP certified technicians, equipment, tools, accessories, and materials required to clean and inspect the designated sanitary sewer lines.
- 1.03 PACP compliant inspections, logs, data, and photos shall be delivered to the Program Manager (from hereon Program Manager shall be interpreted as “Program Manager or his designee”) on external hard drive(s) which will become property of the Program Manager. Data files shall be formatted to facilitate upload into a PACP compliant Exchange database or internet uploads formats to an FTP site approved by the Program Manager.

**PART 2 – MATERIALS & EQUIPMENT**

2.01 MATERIALS

A. Submittals

1. Unless otherwise specified all sample submittals shall be delivered to the Program Manager within two weeks of the NTP.
2. Traffic Control Plan shall be submitted to the Program Manager, including the following items:
  - a. Outline of permit acquisition procedure for lane closures.
  - b. Methods for proper signing and barricades, which comply with City of Memphis requirements.
  - c. Major streets (e.g. Shelby County Principal Arterial & Minor Arterial) requiring a City approved permit if taking a lane for mobile operations, secured through Traffic Control Plan submittal to the City and signed by a TN P.E. The City requires two-week lead time for permit processing.
    - i. The Contractor will be required to deliver a sample primary/arterial road Traffic Control Plan for review by the City.
    - ii. If the City determines that the nature of the work operation or the type of road in which the Contractor is working requires a permit, the Contractor will be required to modify the sample Traffic Control Plan to obtain a permit from the City.
  - d. For everywhere else where a permit is not required, the Contractor shall develop, provide, and implement a traffic control plan for all mobile operations in accordance with standard MUTCD specifications.
  - e. The Contractor is also responsible for acquiring all necessary disposal and/or landfill site permits as required to perform this work.

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- f. Railroad Rights of Way: The Contractor shall notify the Program Manager when work or access to manholes and sanitary sewers lie within the 25 feet railroad easement as measured by 25 feet outside the nearest rail of the tracks. To access sewer facilities within the 25 feet of the railroad right of way the Contractor shall contact the Program Manager 48 hours in advance who will alert the City's Zone Construction Inspector to coordinate individual railroad direction and guidance.
3. Site Contractor emergency phone numbers.
4. Schedules of work on a weekly basis that will be delivered no later than 2:00 PM on Thursday for the week following with daily AM email updates of approximate crew locations each day.
  - a. Weekly schedule format shall contain the following elements:
    - i. Map format.
    - ii. Sufficient streets labeled and identified at a scale to provide clarity.
    - iii. Nature and type of crew location by map area.
5. Permit required confined space entry plans in compliance with the Loss Control Manual.
6. Copies of National Association of Sewer Service Companies (NASSCO) certification for all field staff conducting PACP inspections.
7. Sample of PACP compliant television survey log in MS Access format.
8. Sample of PACP compliant video inspection in MP-4 (Web optimized)format.
9. Cleaning and CCTV vehicle, equipment,andcleaning supplies list.
10. Disposal site(s) and appropriate landfill permits for appropriate disposal of all waste materials removed from the sewer during the light and heavy cleaning operations.

2.02 EQUIPMENT

A. General

1. All equipment used for PACP compliantCCTV sewer segment inspections of existing sanitary sewer mains andconnectionsshall be specifically designed and manufactured for the purpose intended under this Contract. The software and hardware for the electronic capture of the inspection defects and recorded observations must be Version 6.0.1NASSCOPACP compliant.
2. The Contractor shall submit an equipment list to the Program Manager for approval before the commencement of the Work and shall certify that back-up equipment is available and can be delivered to the worksite within 72 hours.
3. The Contractor shall provide equipment to perform inspections of sewer mains located in streets, street rights-of-way, backyards, easements and rights-of way that are off-road.



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- a. Including but not limited to portable CCTV equipment, vehicles capable of transporting TV equipment and accessing remote easements, and adequate cleaning equipment rights of way or easement applications.

**B. PACP Compliant Software &Data Logger Requirements**

**1. Data logger**

- a. Internal inspection logs created and captured electronically during the television inspection through the use of commercially available electronic data loggers in the truck are required. NASSCO PACP protocols Version 6.0.1 shall be used for capturing and recording the observations. Audio commentary made during the inspection and captured on the digital video shall correspond with the PACP observations on the log.
  - b. The data logger equipment and software shall allow the Program Manager access directly to the captured electronic data and provide for a non-proprietary export of the data into MSACCESS databases in accordance with PACP standards for standalone database review.
- 2. Software must be compliant with the NASSCO PACP V.6.0.1 standards. Follow PACP protocol for recording of observations and defects for sewer mains.**
- a. All software shall be capable of providing complete survey reports in compliance with PACP, and the software shall be the V.6.0.1 of the PACP compliant software.
  - b. The Program Manager has no intent to specify which software the Contractor shall use, but requires the software and the submitted database to be fully compliant with PACP V.6.0.1 and capable of being exported to ACCESS databases. No payment will be rendered for improperly formatted data.
  - c. Software and data logger must be capable of capturing sewer main and sewer lateral observations by PACP descriptions, record travel footage along pipeline, and video time stamp the recorded observations to support hyper linking from the digital record to the event point or location within the digital inspection record. The same requirements apply to still photo images (if provided) which shall follow PACP guidelines and be hyperlinked to the inspection log.

**C. Sewer Main CCTV**

**1. Sewer Main Digital Color Video Camera**

- a. All cameras used shall be digital format color CCTV units specifically designed and constructed for use in sewer pipe inspection work. The cameras shall be operable in 100 percent humidity conditions. The camera shall have a high-resolution, 360-degree pan and tilt or rotating head with a wide viewing angle lens and either automatic or remote focus and iris controls. Camera lighting shall be sufficient for use with digital color inspection cameras and for the manhole and pipe diameters identified in the contract.
  - i. Camera, Television Monitor, and Other Components shall be capable of producing a high resolution color digital inspection record.

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- ii. Video file to be in MP-4 (Web optimized) format
- b. In all cases, the complete digital inspection system (camera, lens, lighting, cables, monitors, and recorders) shall be capable of providing a digital picture and digital video quality acceptable to the Program Manager. Inadequate lighting, image distortions, blurry or murky images, and dirty lenses will be a cause for rejection. No payment will be made for unsatisfactory inspections and the Contractor shall perform work until deliverable is of acceptable quality. Digital video cameras/digital recorders not specifically intended for use for internal television inspection of manholes and sewer lines shall not be permitted.
- c. Pan and tilt type camera, capable of turning at right angles to pipe's axis over an entire pipe wall perimeter shall be used.
  - i. The camera lens shall be capable of self-righting itself after a lateral view or connection view with a return view down the pipe with a "home" capability for the lens.
- d. Lighting shall be suitable to allow clear picture of entire inner pipe wall extending at least 10 feet in front, including black High Density Polyethylene (HDPE) pipe.
- e. Document header and observations shall be in accordance with PACP V.6.0.1 protocols.
- f. Contractor shall have equipment capable of cleaning and assessing 12" and smaller diameter siphons.

**D. Cleaning Equipment**

- 1. Hydraulic sewer pipe cleaners or combination hydraulic/vacuum cleaners shall be specifically designed and constructed for such cleaning.
- 2. Mechanical sewer pipe cleaners shall be specifically designed and constructed for such cleaning.
- 3. The Contractor shall possess equipment capable of cleaning hydraulically or mechanically a minimum of 1,000 linear feet of pipe from one direction and have a minimum 1,000 linear feet of hose or cable on-site during the cleaning execution.
- 4. Hydraulic sewer pipe cleaners shall be specifically designed and constructed for such cleaning. The sewer cleaner shall have a minimum usable water capacity of 600 gallons and a pump capable of delivering at least 30 gallons per minute at 1,500 psi at the nozzle.
  - a. The hydraulic cleaning equipment shall have multiple hydraulic cleaner hose nozzles for a variety of sewer cleaning conditions, including grease, roots, debris and granular materials.
  - b. Vacuum equipment shall be capable of lifting debris removed from the segment from the downstream manhole.

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5. Mechanical sewer pipe cleaners (cable machines with buckets, brushes, swabs, root cutters, and power rodders with similar capability) shall be capable of controlled forward and reverse travel through the sewers without inflicting damage to the existing pipe in removing rocks, grit and other heavy debris and roots.

**PART 3 – CONSTRUCTION REQUIREMENTS**

3.01 CCTV Inspection of Sewer Mains

A. Cleaning

1. Sewer pipe cleaners or combination hydraulic-vacuum cleaners must accompany CCTV units at all times. Ideally, sewers lines are to be cleaned and then followed immediately by CCTV inspection. All sewers must be cleaned in advance of CCTV during the same calendar day they are inspected.
2. Light Cleaning
  - a. Before CCTV work, the Contractor shall light clean the sewer line from manhole to manhole, from upstream to downstream direction unless an obstruction is encountered, one sewer section at a time and performed as efficiently as possible at the Contractor's discretion.
  - b. Materials shall not be passed from one sewer segment to another but must be trapped and removed from each sewer segment prior to CCTV inspection.
3. Heavy Cleaning
  - a. If a camera is inserted and additional debris or impediments to inspection are observed following the required light cleaning, heavy cleaning shall be approved by the Program Manager. Sections of pipe containing significant roots, large areas of debris, and/or several inches of depth of sands and gravels that will require the use of additional hydraulic nozzles, cable/bucket machine, power rodders and root cutters is considered heavy cleaning.
  - b. Heavy cleaning will be proposed by the Contractor and approved by the Program Manager. The Contractor must obtain prior approval for heavy cleaning in each sewer segment in order to receive payment for heavy cleaning.
4. Cleaning Execution
  - a. No roots, grease or debris from light or heavy cleaning shall be passed from sewer segment to sewer segment during the cleaning operation. All debris flushed from the sewer must be collected, captured, and removed from the sewer at the downstream manhole.
  - b. Roots shall be removed in the sections where root intrusion is a problem. Special precautions shall be exercised during the cleaning operation to assure complete removal of visible roots from the joint area and so as not to incur further damage to the pipe. Any visible roots that may impact rehabilitation efforts shall be removed. Fine roots are allowed if the Contractor made a heavy cleaning attempt to remove roots with proper root removal means. Procedures may include the use of mechanical devices such

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as rodding machines, expanding root cutters and porcupines, and hydraulic procedures such as high-pressure jet cleaners.

- c. The Contractor is responsible for safe, responsible and legal handling and disposal of all material and debris removed from the sewers. The Contractor is responsible for all permits and landfill fees associated with the disposal of debris collected and removed from the sewer.
- d. The Contractor shall provide a dated manifest of the volume or weight of the dewatered sewer cleaning loads taken and dumped at the permitted dump site selected by the Contractor. Each waste load manifest shall be associated with a list of corresponding sewer segments from where the waste originated.
- e. Siphons shall be cleaned to remove 95% of the debris from the pipe.

**B. Sewer Flow Levels During Inspection Operations**

- 1. Maintain low sewer flow during inspection by using sandbags or flow-through plugs or by inspecting during low flow times of day, evening, or early morning hours while camera is moving and recording observations in the sewer segment. Any items used to restrict flow shall be removed immediately after intended use.
  - a. Flow-through Plugs: If used, secure the plugs so as to remain in place during inspection. Use a fail-safe device at the downstream pipe connection to ensure the plug is not lost in the downstream sewer segment if it becomes dislodged from the upstream pipe connection.
  - b. Conduct all cleaning and CCTV operations to prevent building backups and sewer overflows.
  - c. Contractor shall be responsible for cleanup, repair, fines, property damage costs, and claims for any sewage backup, spillage or sanitary sewer overflow during or as a result of the cleaning and inspection operations.
- 2. Allowable Depth of Flow For Inspection Operations
  - a. For effective inspection, all flow shall be minimized in the segment being inspected. However, the depth of flow at the upstream manhole of the interceptor section being worked shall be within the specified limits provided herein.
- 3. Maximum Allowable Depth of Flow for CCTV Inspection
  - a. 6 - 10 inch diameter Pipe - 20% of pipe diameter
  - b. 12 - 18 inch diameter Pipe - 25% of pipe diameter
  - c. 24-inch diameter and Larger Pipe - 30% of pipe diameter
  - d. Exceptions to these guidelines shall result in rejection, and non-payment, of the CCTV inspection unless approved in advance by the Program Manager.

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C. Camera Operations

1. Using the pan/tilt feature, pan the interior of the manhole for record purposes in accordance with V.6.0.1 PACP protocols and begin and terminate the inspection in the starting and ending manholes.
  - a. Capture the inside of manhole walls, manhole channel, and pipe connection to wall at both upstream and downstream manhole and lateral connections using the digital mainline sewer camera and the pan/tilt feature.
2. Place the camera at center of manhole and commence video before entering pipe.
  - a. Start footage counter at manhole wall/pipe connection or at a short pre-measured distance down the pipe for the sewer segment inspection.
3. Connections: The digital camera shall be used to look at connections and up laterals from the connection in the main sewer pipe being inspected. The camera shall pause, pan, and record all connections. Conditions noted in these sidelines and laterals shall be noted on the inspection logs.
4. Mainline camera operations:
  - a. Move through line at speed no greater than 30 feet per minute stopping for minimum 10 seconds to record lateral connections, mainline connections, defects, and features and points of interest.
  - b. Do not float camera.
  - c. Maintain technical quality, sharp focus, and distortion free picture with the camera lens centered in the pipe for the different diameters inspected.
    - i. Eliminate steam in line for duration of inspection.
    - ii. Utilize blower as needed to defog sewer line.
  - d. Digitally record a complete sewer segment in its entirety with no breaks, "blink-outs," or interruptions from manhole to manhole according to PACP V.6.0.1 formats.
  - e. Pan, tilt, and rotate as necessary to best view and evaluate lateral connections, pipe defects, features, obstructions, and points of interest.
  - f. Use power winches, powered rewinds, self-propelled tractors, or other devices that do not obstruct camera view or interfere with proper documentation of sewer conditions to move camera through sewer.
  - i. Whenever non-remote powered and controlled winches are used, set up telephones or other suitable means of communication between manholes to insure good communication.
  - g. Use hydraulic jet nozzle pressure and flow to remove standing water from depressions or sags in the sewer, if necessary, for complete inspection of the sag portion of the sewer segment.

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- h. Measurement for location of defects and service laterals:
  - i. At ground level by means of Program Manager-approved footage counter or metering device.
  - ii. Electronic display measurement meters: Accurate to PACP standards over length of section being televised.
  - iii. Do not pull unnecessary length of slack camera cable if it impacts the footage counter.
- i. Stop camera at service connections and inspect lateral with pan and tilt camera.
  - i. Identify building connection in PACP compliant terms as active, capped, or abandoned.
  - ii. If no wastewater flows are being discharged from building, consider steady, clear observed flow as infiltration/inflow.
- j. Identification of defects
  - i. If roots, sludge, or sediment material impedes inspection after the light cleaning, withdraw camera and perform heavy cleaning at the direction of the Program Manager.
  - ii. Upon completion of heavy cleaning operation, resume internal inspection.
  - iii. Furnish media confirmation for heavy cleaning (more than three passes with jet cleaner) to Program Manager.
  - iv. If protruding tap impedes inspection trim protruding tap to 1/2 inch.
- k. If obstructions are not passable and cannot be removed by sewer cleaning, withdraw CCTV equipment and perform a reverse inspection from opposite end of the sewer segment in accordance with PACP protocols.
  - i. Contractor shall be responsible for costs associated for reverse set-ups when an obstruction is encountered that cannot be passed.
  - ii. Contractor shall be responsible for all judgments and impacts as to whether an obstruction in the sewer main can be passed. Costs involved in extracting a stuck camera in the sewer main will be borne by the Contractor and at no additional cost to the Program Manager.
  - iii. When additional obstructions are encountered after reversal of equipment and no means are available for passing a second obstruction in order to complete the sewer main inspection, remand the segment inspection to the Program Manager for resolution. The portion of the main inspected will be paid for as prescribed.

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- I. Undocumented facilities
  - i. If undocumented manholes or sewer mains (facilities not on the field updated GIS sewer maps) are encountered during the inspection, the Contractor needs to complete the documentation requirements per PACP requirements and capture on the video the following:
    - 1. Approximate horizontal distance from the upstream or reference manhole.
    - 2. Approximate depth of the undocumented manhole by turning the pan/tilt camera vertically and estimating the height of the cover from the invert.
    - 3. A provisional manhole asset ID number shall be used by the Contractor by adding a dash and two-character number to the closest upstream manhole ID.
  - m. Retrieval of Stuck Equipment
    - i. The Contractor is responsible for hiring a licensed sub-contractor to retrieve any equipment/foreign objects that get stuck in the sewer system through the execution of the scope of work (fallen cameras, jet nozzles, inflatable plugs, sandbags etc.) at the Contractor's own cost. Such retrieval by an appropriately licensed sub-contractor shall be made within 72 hours to avoid interfering with the City of Memphis sewer system operations. Any and all impacts and related costs due to the Contractor's equipment in the line shall be the responsibility of the Contractor. Contractor shall follow SARP10 sewer point repair specifications outlined in "Section 02540 Sanitary Sewer Point Repairs" and "Section 02950 Removal and Replacement of Pavements and Incidentals" during retrieval of equipment. Also per "00585.2.2 Safety, Health, and Accident Prevention Program", Purchaser must approve sub-tier contractors prior to mobilization to the jobsite.

**D. Quality Assurance**

- 1. With each monthly invoice the Contractor shall provide a QA/QC memo documenting that 10% of the previous month's CCTV data has undergone a random, independent review by a PACP certified reviewer using NASSCO standards for Television Inspection of Main Sewer and PACP Quality control as the basis for the QA/QC procedures. The independent reviewer shall be a Tennessee P.E. or is a P.E. in another state and has a Tennessee P.E. license pending. Each line segment which has been randomly reviewed shall be identified in the QA/QC memo as well as any subsequent findings or recommendations. Internal independent QA/QC is acceptable, as long as the person is a Tennessee P.E. or is a P.E. in another state and has a Tennessee P.E. license pending. Failure to submit the QA/QC memo shall delay payment of the current month's invoice.
- 2. For all new Contractors and Operators who begin PACP coding, an initial review of CCTV data will consist of reviewing, at a minimum, 20 of the first 100 PACP inspection records submitted. Subsequent reviews will be based on the results of the initial reviews as explained below.



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3. Auditing Procedures:

a. Header information: As explained in the NASSCO PACP Quality Control Standards each audited inspection record is given an accuracy level for the header information and the detailed observation records. It is expected that the accuracy of the header record exceed 90% because the majority of the contents are based upon facts and not subject to operator judgment. To assess the accuracy level of the header, record the number of errors as compared to the total number of header fields using the following formula:

$$100\% - (\text{error count}/\text{total header fields}) * 100\% = \text{Header Accuracy}$$

b. Detailed Observations: Determining the accuracy level for the detailed observation records is similar to the method for assessing the header record. The main difference being that a defect observation has multiple data entries that must also be counted towards the total number of entry fields. In the event that a defect is not coded all of the required entries for coding the missed defect are counted towards the total error count. The following formula is used to calculate the accuracy level of the detailed observation records:

$$100\% - (\text{error count}/\text{total entries}) * 100\% = \text{Detail Accuracy}$$

c. Review Scoring and Results

i. Satisfactory Review, No changes required. Accuracy Level of 90% or above for both the Header Record and Observation Detail with no major errors or omissions found.

ii. Unsatisfactory Review (below levels of acceptance) will not be accepted by the Program Manager and will not be considered payable items in the Contractor's Request for Payment.

E. Deliverable Documentation

1. Mainline Sewer

a. Submit V.6.0.1 PACP compliant records, logs, and electronic inspection data for sewer line inspection to Program Manager by the close of business on the Monday following a week after data acquisition.

b. Monthly QA/QC memo submittal listing which segments have been randomly reviewed, as well as any subsequent findings or recommendations.

c. Digital videos, data, and photos shall be delivered to the Program Manager on external hard drives which will become property of the Program Manager.

d. Data files shall be formatted to facilitate upload into a PACP Exchange Database with the approval of the Program Manager.

e. Inspections displaying poor digital video/audio quality will be rejected. Quality refers to, but is not limited to, grease or debris on lens, camera under water, image too dark or light, image washed-out, distorted image, out of focus images, lines improperly cleaned, and poor/no audio.

i. Contractor will re-televiser rejected inspections and resubmit inspections at no additional cost to the Program Manager.

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2. Map changes/undocumented manholes:
  - a. For map changes identifying undocumented manholes and network changes which were found as a result of field inspections or observations, a Map Edit Form shall also be prepared and supplied by the Contractor with a drawing or sketch and shall indicate special details, field measurement or distances, or locations about an observed undocumented manhole or a change to the sewer network. The Map Edit Form should also identify buried manholes and siphons that have been encountered.
  - b. Contractor shall indicate all buried manholes identified in the field via CCTV using the provided Buried Manhole Form. Any additional manholes that have not been located or verified via CCTV but are impeding the completion of required CCTV work should be designated as unable to locate (UTL) and be included on the form.

F. Easement or Turf Operation

1. The Contractor will restore the work area to its original condition as quickly as possible after the inspection is complete. The Contractor will not be allowed to postpone restoration of the site until the end of the project.

**PART 4 –DELIVERABLES**

4.01 RECORDS

A. Pipe Cleaning Record

1. The Contractor shall provide a dated manifest of the volume or weight of the dewatered sewer cleaning loads taken and dumped at the permitted dump site selected by the Contractor. Each waste load manifest shall be associated with a list of corresponding sewer segments from where the waste originated.

B. Digital Inspection Record

1. In the digital PACP V.6.0.1 compliant format, the Contractor shall provide the following information:
  - a. Digital CCTV survey inspection which shall be recorded and shall be continuous as the inspection proceeds through the manholes and sewer pipes. Inspection videos should be delivered in an MP-4 (Web optimized) format.
  - b. Digital Recordings: The digital recording shall document the visual and audio record of the manhole and sewer pipe inspection and shall be the basis of measurement and payment. Digital recording playback shall be at the same speed that it was recorded. Original digital recordings for the Project shall be forwarded to the Program Manager on clearly labeled external hard drive(s) in PACP ACCESS format with final report submittals and shall become the property of the Program Manager. Data for a single facility asset will not be split across multiple hard drives. Digital recordings shall be available to the Program Manager by the close of business on the Monday following a week after data acquisition. File naming must be consistent. Additional

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instructions, naming conventions, file structures, etc. will be provided after contract award.

- i. **Picture Quality:** The sewer inspection digital record shall be free of steam, fog, vapor, or other headspace distortion that degrades the quality of the picture from the intended purpose of evaluating the sewer for structural and watertight integrity. If necessary, the Contractor shall provide positive ventilation or other means through the sewer pipe to draw out steam, fog, and vapor that will degrade the recorded image of the pipe.

**C. Inspection Documentation Logs**

1. Observations made during television inspection shall be documented in an unmodified PACP compliant manner within an electronic inspection log form, supported by accompanying audio, digital photographs and MP-4(Web optimized) format recording written to an external hard drive and submitted to the Program Manager. Hard copies of completed inspection log photographs shall be furnished to the Program Manager with invoicing.

**D. Electronic & Hard Copy Records**

1. **Reports:**

- a. The Contractor shall prepare printed inspection log reports for each associated sewer pipes inspected during the actual field inspection activities. These field logs shall then be reviewed by the Contractor's technical staff, along with reviewing the associated digital video record, as a means of ensuring that no defects or entries are omitted or incorrect. Edited field logs shall then be used in the final project reports and submitted in pdf format.

2. **Draft Report and Final Report:**

- a. The Draft Final Report will contain electronic and hard copies of each of the PACPCCTV log pipe segment inspection logs. Digital recordings of the inspections written to an external hard drive and the PACP compliant database of the inspections in ACCESS format shall also be submitted in electronic and pdf format.
- b. Draft Report shall be delivered to the Program Manager within fifteen working days the last or final inspection. The Program Manager will have two workweeks to review and comment. Contractor shall address all comments provided and submit a Final Report within one workweek upon receipt of comments. At the Program Manager's discretion a meeting will be held so the Contractor can explain the processes used to address the comments.

**E. Meetings**

1. The Program Team will arrange bi-weekly meetings (every other week) with the contractor to discuss data management and field issues.

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F. Quality

1. Rejection of deliverables will be submitted to the Contractor via the Program Team in a written communication discussing issues that must be addressed. The Contractor will be required to follow up with a response within three business days upon receipt of the written communication. Contractors will have seven (7) calendar days from the rejection notice date to make the necessary corrections and resubmit the data deliverable in its entirety.

**PART 5 – MEASUREMENT**

5.01 LIGHT CLEANING & CCTV INSPECTION

- A. Light cleaning and mainline CCTV inspections shall be measured by linear foot by each diameter of mainline sewer inspected and documented in accordance with the specification.

5.02 HEAVY CLEANING

- A. Heavy cleaning shall be measured by linear foot of each diameter of heavy cleaning approved by the Program Manager and documented.

5.03 SIPHON CLEANING AND CCTV INSPECTION

- A. Siphon cleaning and CCTV inspection shall be measured per linear foot of each diameter 12" and smaller of sewer inspected and documented in accordance with the specifications.

5.04 REMOTE TRIMMING OF PROTRUDING SERVICE LATERAL

- A. Remote trimming of protruding service lateral that prevent a thorough inspection of the pipe will be measured per each.

**PART 6 – PAYMENT**

6.01 MAINLINE CCTV INSPECTION

- A. Light cleaning and mainline CCTV inspections shall be paid for at the unit price for each linear foot of each diameter inspected and documented in accordance with the specification.
- B. The unit price for Light Cleaning and Mainline CCTV inspection shall cover the entire cost of the required light cleaning and CCTV inspection and reporting in accordance with PACP V 6.0.1 format, including but not limited to labor, mobilization and access, CCTV equipment, recording media, traffic control, light cleaning of mainline sewer, documenting results in PACP records and logs, digital format recordings, photo equipment, power supply for equipment, interim and final reports and all other appurtenant work.
- C. No additional payment will be made for:
  1. Re-inspection due to rejected inspection and/or records for any reason.
  2. Reversals.
  3. Performing excavation and associated sewer point repair to retrieve a stuck CCTV camera or hydraulic cleaning hose/nozzle.

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4. Incomplete electronic logs.
5. Unapproved duplication of inspections: The contractor/subcontractor is responsible to ensure duplications do not occur.

**6.02 HEAVY CLEANING**

- A. Heavy Cleaning shall be paid for at the unit price for each linear foot of each diameter of heavy cleaned sewers at the direction of the Program Manager and in accordance with the specification.
- B. The unit price for Heavy Cleaning shall include the entire cost including but not limited to labor, mobilization and access, traffic control, appropriate disposal of sewer debris removed from sewer at permitted site and all other appurtenant work. Payment includes non-hydraulic jet efforts such as porcupines, cutters, power rodding, clam buckets, and other mechanical means, traffic control, and re-cleaning with hydraulic jet, labor, materials, and equipment necessary to clean mainline sufficiently to allow video reviewers a clear picture of pipe conditions.
- C. No additional payment will be made for:
  1. Additional passes of heavy cleaning if the inspection observation reveals roots, grease or other debris remaining in the sewer after the heavy cleaning passes.

**6.03 SIPHON CLEANING AND CCTV INSPECTION**

- A. Siphon cleaning and CCTV inspection shall be paid for at the unit price for each linear foot of each diameter 12” and smaller inspected and documented in accordance with the specification.
- B. The unit price for Light Cleaning and Mainline CCTV inspection shall cover the entire cost of the required light cleaning and CCTV inspection and reporting in accordance with PACP V 6.0.1 format, including but not limited to labor, mobilization and access, CCTV equipment, recording media, traffic control, light cleaning of mainline sewer, documenting results in PACP records and logs, digital format recordings, photo equipment, power supply for equipment, interim and final reports and all other appurtenant work.
- C. No additional payment will be made for:
  1. Re-inspection due to rejected inspection and/or records for any reason.
  2. Reversals.
  3. Performing excavation and associated sewer point repair to retrieve a stuck CCTV camera or hydraulic cleaning hose/nozzle.
  4. Incomplete electronic logs.
  5. Unapproved duplication of inspections: The contractor/subcontractor is responsible to ensure duplications do not occur.

**6.04 REMOTE TRIMMING OF PROTRUDING SERVICE LATERAL**

- A. Remote trimming of protruding service lateral that prevent a thorough inspection of the pipe will be measured per each.

**6.05 PAYMENT WILL BE MADE UNDER:**

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<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
00003-6.01	LIGHT CLEANING & MAINLINE CCTV INSPECTION FOR EACH DIAMETER	LF
00003-6.02	HEAVY CLEANING FOR EACH DIAMETER	LF
00003-6.03	SIPHON CLEANING AND CCTV INSPECTION FOR EACH DIAMETER	LF
00003-6.04	REMOTE TRIMMING OF PROTRUDING LATERAL	Each

**END OF SECTION 00003**

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**PART 1 - SCOPE**

1.01 This Work will consist of the construction of sanitary sewers, and service connections of the kinds and dimensions shown on the Plans, stipulated in the Contract Documents, or as directed by the Purchaser. The construction will be accomplished by these Specifications and in conformity with the lines, grades, and details shown on the Plans or established by the Purchaser. The Subcontractor will perform all work necessary to complete the Contract with the best modern practice. Without specifications that state the quality of any work, the Subcontractor is required to perform such items using first-quality construction. Unless otherwise provided, the Subcontractor will furnish all material, equipment, tools, labor and incidentals necessary to complete the Work.

**PART 2 – MATERIALS AND EQUIPMENT**

2.01 MATERIAL

A. Construction Material

1. All material furnished by the Subcontractor will be new, high quality and free from defects. Previously used material in acceptable condition may be used for bracing, forms, false work, and similar uses. Material not conforming to the requirements of the Specifications will be considered defective and will be removed immediately from the site.

B. Higher Strength Pipe

1. The Subcontractor may substitute a higher strength pipe of the same type as that specified subject to the approval of the Purchaser.

C. Qualifications of Manufacturers

1. Pipe for sanitary sewers will be the standard product of an established, reputable manufacturer made in a permanent plant. Suppliers for each material to be used by the Subcontractor will be subject to approval by the Purchaser. No material will be delivered until the manufacturer and product have been approved by the Purchaser. For any construction project, pipe and appurtenances for each pipe material shall be the product of a single manufacturer having a minimum of 10 years domestic experience producing the type of pipe supplied.

D. Material Inspection and Testing

1. Representative samples of material intended for incorporation in the work will be submitted for examination when so specified or requested. All material to be used in the work will be sampled, inspected, and tested by current ASTM specifications, or other standard specifications. The Subcontractor will furnish the Purchaser with three copies of certified reports from a reputable testing laboratory showing the results of the tests carried out on representative samples of material to be used on the Project. Each length of pipe delivered to the project will show the laboratory's stamp. The performance or cost of all testing is the responsibility of the Subcontractor.

2. The Subcontractor will notify the Purchaser before any deliveries of material and will make whatever provisions are necessary to aid the Purchaser in the inspection and culling of the material before installation.

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E. Storage

1. The Subcontractor will provide and maintain storage facilities and exercise such measures to maintain the specified quality and fitness of material to be incorporated in the work. The interior and sealing surfaces of the pipe, fittings and adapters will be kept free from dirt and foreign matter. PVC pipe, fittings, and adapters stored outside and exposed to sunlight will be covered with an opaque material with proper ventilation.

F. Prestressed Concrete Cylinder Pipe

1. All prestressed concrete cylinder pipe shall conform to the requirements of AWWA C 301 and C 304 and will be designed for a variable depth of cover as shown on the profile; the maximum trench loading that can occur on an empty pipe after backfill is in place; and a live load equal to the AASHTO HS20 loading or the minimum live load as specified in AWWA C 301, whichever is greater. The interior surface of the pipe will be a smooth, cylindrical surface. Cement will meet all the requirements ASTM C 150, Type II. Steel cylinder shall be made of steel sheets not lighter than No. 16 gauge with a minimum yield strength of 33,000 psi, and conforming to the requirements of "Standard Specification for Hot-Rolled Carbon Steel Sheets and Strip Structural Quality", Grade 33, ASTM designation A 570. Steel used for the bell rings for pipe and fittings shall have a minimum yield strength of 30,000 psi and conform to the requirements of ASTM A 570. Steel plate and special shapes for spigot joint rings shall conform to the requirements of ASTM A 36 or the other ASTM specifications listed in AWWA C 301. High tensile prestressing wire shall be a minimum of No. 6 gauge and maximum class shall be Class III. The wire shall conform to the requirements of "Standard Specification for Steel Wire, Hard-Drawn for Prestressing Concrete Pipe", ASTM A 648. No lifting holes will be allowed. The pipe will be furnished complete with gaskets, grout bands and lubricant as required for proper installation.

2. The interior of all 36 inch and larger diameter pipe will be fully lined with a PVC liner as specified in Section 02530 Paragraph 2.01.DD. The liner will be installed by the pipe manufacturer prior to pipe delivery.

3. The liner will be welded at each joint after installation and testing of the pipe. Exceptions to the welding requirement may be granted at the direction of the Purchaser.

4. Fittings shall be composed of cut and welded steel plate with all welds inspected, and the completed cylinder shall be tested for tightness by the dye penetrant method. Fittings shall have wire reinforcement applied to the interior and exterior surfaces. Concrete and mortar linings shall be at least 3/8 inch thick and exterior mortar coating shall be 1 inch thick unless otherwise indicated. All materials and workmanship shall be as specified in AWWA C 301.

a. Curves of long radius may be formed by the use of pipe on which the spigot joint rings are placed on a bevel or by the use of bevel adapters. Special pipes shall be designed to provide the same strength as the adjacent pipe. Branch connection or openings, such as manholes and bypass pumping connections, shall be incorporated in straight pipe and shall be suitably reinforced. Special pipes shall be provided with joint rings corresponding to those on adjoining straight pipes. Special ends shall be provided on concrete pipe, where required to connect to pipe of other manufacturers and special structures.



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G. Reinforced Concrete Pipe

1. All reinforced concrete pipe for gravity sewer applications will conform to the requirements of ASTM C 76 for circular pipe, Wall B for the specified diameter and strength class. If no class is specified, Class III pipe will be used. The interior surface of the pipe will be a smooth, cylindrical surface. Cement will meet all the requirements ASTM C 150, Type I. No lifting holes will be allowed. The pipe will be furnished complete with gaskets, grout bands and lubricant as required for proper installation. Pipe will be designed for a 0.01 inch crack D-Load. The ultimate D-Load will be at least 1.5 times the 0.01 inch D-Load.
2. The interior of all 36 inch and larger diameter pipe will be fully lined with a PVC liner as specified in Section 02530 Paragraph 2.01.DD. The liner will be installed by the pipe manufacturer prior to pipe delivery.
3. The liner will be welded at each joint after installation and testing of the pipe. Exceptions to the welding requirement may be granted at the direction of the Purchaser.
4. Joints in reinforced concrete pipe less than 30 inches in diameter will have compression gaskets or trapped O-ring gaskets. Pipes 30 inches in diameter or greater will have trapped O-ring gaskets meeting the requirements of ASTM C 443. When required, concrete pipe ends will be manufactured with steel bell and spigot end rings with a groove on the spigot for an O-ring rubber gasket. This joint will meet the joint requirements of ASTM C 443 and ASTM C 361. The shape, dimensions, and tolerances of the bell and spigot or tongue and groove ends of the pipe will meet the requirements of ASTM C 443. The ends of the rubber gasketed pipe will be accurately manufactured so that, when adjacent pipe sections are drawn together, the rubber gasket will be uniformly compressed around the periphery of the pipe to provide a watertight seal.

H. Ductile Iron Pipe and Fittings

1. Ductile iron pipe for gravity sewer and service connections will conform to ASTM A 746. Ductile iron pipe for force main applications will conform to ANSI A 21.51. The pipe thickness design will conform to ANSI A 21.50. If no thickness class is specified on the Plans or Contract Documents, Class 50 or approved equivalent will be used. All ductile iron pipe will be lined with either Protecto 401 Ceramic Epoxy, SewPer Coat Cement Mortar Lining, or Polyethylene. Linings will be applied according to manufacturer's recommendations. Fittings will conform to the requirements of ANSI A 21.10. Unless otherwise specified, joints will be push-on gasket type conforming to the requirements of ANSI A 21.11. Mechanical joints will conform to the requirements of ANSI A 21.11. Flanged joints will conform to the requirements of ANSI A 21.15. Flexible joint ductile iron pipe for river crossing applications will conform to ASTM A 536 and will be Grade 70-50-05. Steel retainer rings will conform to ASTM A 148 for Grade 90-60.

I. Deleted.

J. Polyvinyl Chloride (PVC) Gravity Pipe and Fittings (8-15 inch Diameter)

1. All PVC gravity pipe and fittings 8-15 inches in diameter shall be solid wall PVC; no profile wall PVC pipe is allowed for pipes 15 inches or less in diameter. PVC solid wall pipe and fittings for gravity sewer applications will conform to the requirements of ASTM D 3034. The standard dimension ratio (SDR) will be SDR 26 (Type PSM). PVC resin will conform to ASTM D 1784 cell class 12454C. A different cell class will be allowed only if the material meets the requirements of a superior cell class than 12454C. Fittings for PVC gravity sewer pipe will be fabricated from PVC meeting the respective ASTM PVC pipe standard for molded or extruded PVC. The wall thicknesses of the waterway and bell of fittings will be no less than the respective minimum thicknesses for the equivalent pipe. All fittings will be compatible with the pipe to which they are attached.

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2. All PVC gravity pipe joints will be gasketed bell and spigot push-on type conforming to ASTM D 3212, unless directed otherwise in these Specifications. Gaskets will be part of a complete pipe section and purchased as such. Lubricant will be as recommended by the pipe manufacturer.
  3. Solvent welded PVC saddle wye's may only be used on existing PVC and truss gravity sewer mains. Collar joints for fittings will be either Type SC (solvent cement) or Type OR (flexible gasketed compression joint) and will conform to the requirements of ASTM D 2680.
- K. Polyvinyl Chloride (PVC) Profile Pipe and Fittings (18-36 inch Diameter)
1. All 18-36 inch diameter PVC sewer pipe and fittings shall be designed and manufactured in accordance with ASTM F 679, F 794, F 949, or F 1803. All PVC sewer pipe and fittings shall be manufactured from PVC resin with a cell classification of either 12454C or 12364C as defined in specification ASTM D 1784. The pipe shall be furnished complete with gaskets, fittings, lubricant, etc. as required for proper installation and completion of the line. The minimum pipe stiffness at 5% deflection shall be 46 psi when tested in accordance with ASTM D 2412 and as specified in ASTM F 679, F 794, F 949, or F 1803, as applicable. Samples of the type of pipe to be used shall be tested in accordance with ASTM D 2412. Impact tests shall be conducted in accordance with ASTM D 2444 and shall comply with ASTM F 679, F 794, F 949, or F 1803. Tests may be conducted by the manufacturer in the presence of the Purchaser. The City and Purchaser shall have the right to make unannounced visits to the pipe manufacturer's facility to inspect the manufacturing process.
  2. All joints shall be the bell and spigot type and conform to ASTM D 3212. Gaskets shall meet ASTM F 477. All bells shall be formed integrally with the pipe and shall contain a factory installed elastomeric gasket which is positively retained. No solvent cement joints will be permitted in field construction.
  3. The pipe manufacturer shall furnish to the Purchaser a notarized certificate(s) of inspection stating that each piece of pipe used on this project was made and tested in accordance with these specifications.
  4. All pipeline material shall be generically the same throughout the project with the permissible exception of utilizing different material for piping used for tie-ins of smaller lines, or as noted on the plans or as approved by the Purchaser.
- L. Glass Fiber Reinforced Polymer Mortar Pipe and Fittings up to 72 inch Diameter
1. Pipe shall meet the requirements of ASTM D 3262 - Standard Specification for Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe. The pipe shall be manufactured to form a dense, non-porous, corrosion-resistant, composite pipe that is resistant to corrosion from hydrogen sulfide and other corrosive materials normally found in sewerage systems, all without the use of special HDPE or PVC liners.
  2. Minimum acceptable nominal length for joints of pipe shall be 20 feet except where field conditions require otherwise.
  3. Design: The design of the pipe shall comply with all requirements of the latest revision of ASTM D - 3262 for non-pressure (gravity) flow conditions. The pipe shall also be designed for a variable depth of cover as shown on the profile; the maximum trench loading that can occur on an empty pipe after backfill is in place; and a live load equal to the AASHTO HS20 loading or the minimum live load as specified in the latest revision of ASTM D - 3262, whichever gives the greater live load.

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4. Resin Systems: These shall be only polyester resin systems with a proven history of satisfactory performance in sewage applications. Historical data shall have been acquired from a composite material of similar construction and composition.

5. Glass Reinforcements: Reinforcing glass fibers used in the manufacture of the pipe shall be of the highest quality commercial grade E-glass filaments with binder and sizing compatible with impregnating resins.

6. Interior Lining: All interior surfaces of the pipe shall be lined with a fiberglass reinforced polyester lining as a part of the manufacturing process.

7. Joints: The pipe shall be field connected with fiberglass sleeve couplings that utilize full face elastomeric sealing gaskets of EPDM rubber compound, providing a zero leakage joint. The coupling shall be factory assembled to one end of the pipe. Each joint shall be pressure tested after installation.

8. Tests and Examinations: Tests, in-process and final examinations shall be performed by the manufacturer, or an independent testing laboratory approved by the Purchaser, in accordance with the latest revision of ASTM D 3262, in order to assure conformance. All instruments, gauges, and other testing and measuring equipment shall be of the proper range, type and accuracy to verify conformance and test equipment shall be checked at least annually against calibrated and certified test gauges and instruments. The Purchaser shall have access to all records of tests and inspections related to the manufacture of the pipe, and, without notice to the manufacturer, shall also have the right to witness the manufacture of the pipe and any tests being performed by the manufacturer or his suppliers relative to products, materials, or the pipe being produced. Copies of records of tests and inspections shall be submitted if requested by the Purchaser.

a. Pipes: These shall be manufactured and tested in accordance with ASTM D 3262.

b. Joints: Coupling joints shall meet the requirements of ASTM D 4161 and/or produce a zero leakage joint.

c. Stiffness: Minimum pipe stiffness when tested in accordance with ASTM D 2412 shall be 46 psi.

9. Fittings and Special Pipe: Fittings shall be contact molded or manufactured from mitered sections of pipe joined by glass-fiber-reinforced overlays, all capable of withstanding all operating conditions when installed.

10. Curves of long radius shall be formed by the use of bevel end pipe or by the use of bevel adapters. Deflection of pipe joints to form the long radius curves will not be accepted. Special pipes shall be designed to provide the same strength as the adjacent pipe. Branch connections or openings, such as manholes and bypass pumping connections, shall be incorporated in straight pipe and shall be suitably reinforced. Special pipes shall be provided with joints corresponding to those on adjoining straight pipes. Special ends shall be provided on pipe, where required, to connect to pipe of other manufacturers and special structures.

11. Unloading Handling and Storage: All pipe shall be inspected at time of delivery, and damaged pieces rejected and removed from the site of the work. Unloading shall be done by mechanical equipment designed to properly handle the pipe, and dropping from delivery vehicles will not be permitted. Pipe shall be stored in an orderly manner to protect the pipe from injury, and from damage by freezing, all in accordance with the manufacturer's written instructions.

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M. High Density Polyethylene (HDPE) Pipe and Fittings

1. High Density Polyethylene Pipe (HDPE) may be used in construction of inverted siphons. No HDPE will be allowed in any other gravity sewer application. All HDPE shall be manufactured from virgin, extra high molecular weight, high density PE3408 or PE3608 polyethylene pipe grade resin to a minimum cell classification of PE345434C as determined by ASTM D3350. No post consumer recycled polyethylene materials shall be allowed. The minimum material classification shall conform to III C 5 P34 as determined by ASTM D1248.
2. All HDPE pipe and fittings shall conform to ASTM F714 and ASTM D3261, respectively, and have a Standard Dimension Ratio (SDR) of 17, maximum.
3. Successive joints of HDPE pipe shall be joined by heat fusion at a fusion pressure of 75 psi and temperature of 400° F. All such connections shall be performed in strict accordance with the manufacturer's instructions.

N. Polyvinyl Chloride (PVC) Pressure Pipe and Fittings

1. PVC pipe and couplings for force main applications will conform to the requirements of ASTM D 2241 and AWWA C 900 Standard for Polyvinyl Chloride (PVC) Pressure pipe 4 inches through 12 inches for Water. The minimum pressure class will be Class 100 or as specified and outside diameter base (IPS or CI) will be as specified in the Plans or Contract Documents.
2. Joints for pipe and couplings will be solid ring elastomeric gasket type. Gaskets must withstand internal pressures of not less than the minimum sustained pressure and burst pressure requirements specified for the pipe with which they are designed to be used. No solvent cement joints will be allowed. Joints will conform to the requirements of AWWA C 900 and/or ASTM D 2241.

O. High Density Polyethylene (HDPE) Pressure Pipe and Fittings

1. High Density Polyethylene Pipe (HDPE) shall be manufactured from virgin, extra high molecular weight, high density PE3408 polyethylene pipe grade resin to a minimum cell classification of PE345434C as determined by ASTM D3350. No post consumer recycled polyethylene materials shall be allowed. The minimum material classification shall conform to III C 5 P34 as determined by ASTM D1248.
2. All HDPE pipe and fittings shall conform to ASTM F714 and ASTM D3261, respectively, and have a Standard Dimension Ratio (SDR) of 17, maximum.
3. Successive joints of HDPE pipe shall be joined by heat fusion at a fusion pressure of 75 psi and temperature of 400° F. All such connections shall be performed in strict accordance with the manufacturer's instructions.

P. Air/Vacuum Valves, Automatic Air Release Valves and Combination Valves

1. The Air/Vacuum Valves shall be single body, double orifice and shall automatically exhaust air from the force main while being initially filled with fluid. After the air has been exhausted from the line, the valve shall close tightly. The valve shall remain closed as long as the sewer line is under positive pressure. Should the force main pressure fall below atmospheric pressure, the valve shall reopen to allow air to enter the pipe thereby preventing a negative pipe pressure. The valve shall be designed to prevent clogging due to solids in the fluid. Each of these valves shall be designed to separate the liquid from the sealing mechanism. The Air/Vacuum Valves shall be as manufactured by A.R.I. or approved equal.

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2. The Combination Air Valve shall consist of a combination of an air and vacuum large orifice and an automatic small orifice in a single body. The valve must be designed to operate with liquids carrying solid particles. The valve shall discharge air during the filling or charging of the system and admit air to the system while being emptied of liquid and discharge accumulated air from the system while it's under pressure and operating. Each of these valves shall be designed to separate the liquid from the sealing mechanism. The valve shall have a working pressure range up to 150 psi or as specified on the plans. Combination Valves shall be A.R.I. or approved equal.

3. The manufacturer shall certify venting capacity and provide three copies of installation and maintenance manuals for each type of Combination Air Valve and Air/Vacuum Valve supplied.

4. The Manufacturer shall guarantee all items specified to be free from defects in design, materials and workmanship for one year from the date of acceptance. During the guarantee period, the Manufacturer shall furnish and install replacement parts for any defective component at no additional cost.

#### **Q. Check Valves, Gate Valves and Ball Valves**

1. All check valves shall have external arms so that the valve may be opened and closed by hand. Check valves shall be controlled closing swing check valves and shall be Golden-Anderson Series 250, or Valve and Primer Series 6000, or as approved. Each check valve shall have a cast iron body, stainless steel plates, stainless steel springs, stainless steel hinge pins and stops, Teflon spring and hinge bearings and standard trim for IBBM construction. All wetted components shall be 316 stainless steel. Each check valve shall have Buna N seals.

2. All check valves shall be class 125 vertical or horizontal swing type with iron body and flanged ends.

3. Knife gate valves will be manufactured by Red Valve Company, Inc, Pittsburgh, PA; and shall be their Standard Flexgate, or approved equal. Knife gate valves must conform to AWWA C-504 requirements. The shaft shall be constructed of Type 304 stainless steel. The knife gate shall be Type 316 stainless steel. The valve seat shall be a resilient, mechanically retained, field replaceable, polytetrafluoroethylene elastomer. The upper and lower bearings shall be self lubricating Teflon. The valve shall be equipped with a handwheel.

4. Wedge gate valves will be resilient wedge gate valves as manufactured by Mueller Co., or approved equal. Wedge gate valves must conform to AWWA C 509 or AWWA C 515 and will be either series 2360 or series 2361.

5. All ball valves for 2 inch and 3 inch diameter fittings shall be full port, brass ball valves, shall be rated to 125 psi minimum, and shall meet the requirements of NSF/ANSI 61/8. Ball valves will have threaded connections and blowout proof stems. Ball valves will be Series FBV-3C as manufactured by Watts, or as approved.

6. Valve manufacturer shall furnish certification that each valve has been subjected to a hydrostatic water pressure twice the pressure class and that each valve is free of defects. The valve manufacturer shall guarantee all items specified to be free from defects in design, materials and workmanship for one year from the date of acceptance. The manufacturer shall, during the guarantee period, furnish and install replacement parts for any defective component at no additional cost.

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R. Steel Casing Pipe

1. Casing pipe will conform to ASTM A 139. Minimum yield strength will be 35,000 psi. Wall thickness will meet the requirements of the latest revision of the American Railway Engineering Association Manual of Recommended Practice unless otherwise specified. Wall thickness will be:

Nominal Thickness Inches	Nominal Diameter Inches
0.188	Less than 14
0.219	14 and 16
0.250	18
0.281	20
0.312	22
0.344	24
0.375	26
0.406	28 and 30
0.438	32
0.469	34 and 36
0.500	38, 40, and 42

2. When casing is installed without a protective coating and is not cathodically protected, the wall thickness shown above will be increased to the nearest standard size that is a minimum of 0.063 inches greater than the thickness shown. This requirement does not apply to casing diameters less than 12 3/4 inches.

S. Lubricants for Prefabricated Pipe Gaskets

1. The lubricant used in jointing pipes fitted with flexible, rubber gaskets will be as recommended by the pipe manufacturer. Lubricants will be suitable for use at temperatures from 5° to 120° F (-15°C to 50°C). Containers will be labeled with the intended, compatible pipe material and the manufacturer's name.

T. Primers and Adhesives

1. All primers and solvents used with ABS Composite Sewer pipe will conform to ASTM D 2235 and will be applied as recommended by the manufacturer. For bonding PVC to PVC, solvent cement will conform to ASTM D 2564. For bonding PVC to ABS, solvent cement will conform to ASTM D 3138. Adhesives used to fasten flexible rubber or rubber gaskets will conform to the requirements of the gasket manufacturer.

U. Adapters and Couplings

1. At the direction of the Purchaser, a connection of sanitary sewer pipes, 6 inches through 16 inches, of dissimilar material, different sizes or for the repair of sanitary sewer pipes of similar material may be made by means of an approved compression or mechanical connector or adapter. The gaskets for compression connectors or adapters will be manufactured of an approved preformed elastomeric material conforming to applicable sections of ASTM Standards C 143, C 425, C 564, and D 3212. Mechanical couplings or adapters will have tightening clamps or devices made of 300 series stainless steel with a stainless steel shear ring and stainless steel hardware, as specified in ASTM A 167. If a stainless steel shear band is not used a concrete collar is required. Each connector and adapter will bear the manufacturer's name and required markings. Installation will be by the manufacturer's recommendations.

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2. At the direction of the Purchaser, a connection of sanitary sewer pipes (18 inches in diameter and larger) of dissimilar material, different sizes or for the repair of sanitary sewer pipes of similar material may be made in accordance with Specification Section 02530 Paragraph 3.09.C. Mechanical connectors meeting the above requirements may be used at the direction of the Purchaser.

V. Portland Cement Concrete

1. Portland Cement Concrete will be of the class and dimensions shown on the Plans, or as directed by the Purchaser. The classes of concrete are called Class A and Class C. Class A concrete is intended principally for concrete structures designed for high strength. Class C concrete is low strength concrete, intended principally for foundation stabilization, pipe cradles and encasement and other general purpose uses. All portland cement, coarse aggregate, fine aggregate, water, air entraining agents and chemical admixtures, their proportioning, mixing, delivery, minimum strength, sampling and testing will be as specified in Specification Section 03050.

W. Crushed Limestone

1. Crushed limestone will be size No. 67 Coarse Aggregate meeting the requirements of the Tennessee DOT Standard Specifications for Road and Bridge Construction and the following gradation:

Total Percent by Dry Weight, Passing Each Sieve (U.S. Standard)					
Size No.	1"	3/4"	3/8"	No. 4	No. 8
67	100	90- 100	20- 55	0- 10	0- 5

X. Sand

1. Sand for pipe bedding will consist of natural sand, all of which passes a 3/8 inch sieve and not more than 10 percent passes a No. 200 sieve.

Y. Mortar

1. Mortar will be composed of one part portland cement, two parts masonry sand, hydrated lime not to exceed 10 percent of the cement used, and 4 parts water. All ingredients will be proportioned by measurements and not by estimating. All portland cement, sand, and water will be as specified in Specification Section 03050. All hydrated lime will be as specified by ASTM C 6.

2. The mortar will be hand mixed or machine mixed. In the preparation of hand mixed mortar, the sand, cement and hydrated lime will be thoroughly mixed in a clean, tight, mortar box until the mixture is of uniform color, after which water will be added. Machine mixed mortar will be prepared in an approved mixer and will be mixed not less than 1½ minutes. Mortar will be used within 30 minutes after mixing.

Z. Bracing Lumber

1. Lumber for tunnel bracing will be a minimum of 3 inches thick and made of bridge oak. All timbers will be of good quality, straight grained, and free from weakening knots and other defects. Bracing will be placed to form a structurally sound timber tunnel. The timber tunnel lining will remain in place after laying the pipe and backfilling.

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AA. Pit Run Gravel

1. Pit run gravel will consist of one of the three gradations shown in the table below.

Size No.	Total Percent by Dry Weight, Passing Each Sieve (U.S. Standard)						
	2½"	2"	1½"	1"	¾"	No.40	Clay *
1	100	95-100			35-65	10-30	1-12
2		100	95-100		40-65	10-30	1-12
3			100	90-100	45-65	10-35	2-12

\*Clay content will be determined by the Hydrometer Test-AASHTO T 88. Clay content up to 15 percent may be used with the approval of the Purchaser.

2. That portion passing the No. 40 sieve will be known as the binder. The binder aggregate will consist of hard durable particles of limestone or sound siliceous material. Shale aggregate or pipe clay binder will not be acceptable. The percent of silt will not exceed the percent of clay by more than 25 percent. If the binder material is insufficient to bond the aggregate a satisfactory binding material may be incorporated, as approved by the Purchaser, so that the resultant mixture will comply with these Specifications. The mixing will be done uniformly, and blending of material on stockpiles or in the pits by bulldozers, clamshells, draglines, or similar equipment will not be permitted.

BB. Brick

1. All brick will conform to ASTM C 55 for Grade A. Unless otherwise approved by the Purchaser, bricks will conform to the following dimensions:

	Depth (in)	Width (in)	Length (in)
Standard Size	2 1/4	3 3/4	8
Allowable Variation	+ 1/4	+ 1/4	+ 1/2

2. All brick will be new and whole, of uniform standard size and with straight and parallel edges and square corners. Bricks will be tough and strong and free from harmful cracks and flaws. Brick will be culled after delivery if required and all culls will be removed from the work site.
3. The Subcontractor may be required to furnish the Purchaser with at least five bricks of the character and make he proposes to use, at least one week before any bricks are delivered for use. All brick will be of the same quality as the accepted samples.

CC. Non-Shrinking Grout

1. Grout will be mixed in small quantities as needed and will not be retempered or used after it has begun to set. Unless otherwise specified, the grout will consist of one part portland cement, two parts masonry sand by volume, a nonshrinking, nonmetallic admixture and sufficient water to form a grout of proper consistency. When nonshrinking or nonshrinking fast setting grout is specified it will be formulated by the incorporation of an admixture, or a premixed grout may be used.



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2. The formulation, admixture or the premixed grout used will be subject to the approval of the Purchaser and will be mixed and used according to the recommendations of the manufacturer. These special grouts will be classified as follows:

- Type I - Nonshrinking Grout
- Type II - Nonshrinking, Fast Setting Grout

Portland cement, masonry sand, and water will conform to the requirements of Specification Section 03050.

**DD. Polyvinyl Chloride (PVC) Protective Lining for Concrete Pipe and Structures**

1. Liner shall be Ameron T-Lock as manufactured by Ameron Protective Coatings Division, Brea, California or approved equivalent.
2. The material used in the liner and in all joint, corner, and welding strips shall be a combination of polyvinyl chloride resin, pigments, and plasticizers, specially compounded to remain flexible. Material color shall be white.
3. Polyvinyl chloride resin shall constitute not less than 99 percent, by weight, of the resin used in the formulation. Copolymer resins will not be permitted.
4. Tensile specimens shall be prepared and tested in accordance with ASTM D412 using die B. Weight change specimens shall be 1-inch by 3-inch samples of the sheet thickness. Specimens may be taken from sheet and strip at any time prior to final acceptance of the work.
5. Liner plate locking extensions embedded in concrete shall withstand a test pull of at least 100 pounds per linear inch applied perpendicularly to the concrete surface for a period of one minute, without rupture of the locking extensions or withdrawal from embedment. This test shall be made at a temperature of 70-80°F inclusive.
6. All plastic liner plate sheets, including locking extensions, all joint, corner and welding strips shall be free of cracks, cleavages or other defects adversely affecting the protective characteristics of the material. The Purchaser may authorize the repair of such defects by approved methods.
7. The lining shall have good impact resistance, shall be flexible and shall have an elongation sufficient to bridge up to 1/4-inch settling cracks, which may occur in the pipe or in the joint after installation, without damage to the lining.
8. The lining shall be repairable at any time during the life of the structure.
9. Liner shall be a minimum of 0.065 inches in thickness. Locking extensions (T-shaped) of the same material as that of the liner shall be integrally extruded with the sheet. Locking extensions shall be approximately 2.5 inches apart and shall be at least 0.375 inches high.
10. Sheets shall have transverse strap channels cut in the locking extensions so that the strap can be placed into and perpendicular to the locking extensions.
11. These channels shall be not less than 3/4 inch wide and not more than 1 1/4 inch wide and shall be cut so that a maximum 3/16 inch of the base of the locking extension remains in the base of the strap channel. Strap channels shall be provided at intervals of not less than 15 inches and no more than 20 inches center-to-center. The strap channels will not be cut through the final two locking extensions on each edge of the sheet.

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12. Transverse flaps shall be provided at the ends of sheets for pipe. Locking extensions shall be removed from flaps so that a maximum of 1/64 inch of the base of the locking extension is left on the sheet.

13. Weld strips shall be approximately 1 inch wide with a minimum width of 7/8 inch. The edges of weld strips shall be beveled in the manufacturing process. Thickness of weld strip shall be a nominal 1/8 inch.

14. All sheets used shall be shop tested for pinholes using an electrical spark tester set at 20,000 volts minimum. Any holes shall be repaired and retested.

EE. Reserved

FF. Reserved

GG. Reserved

#### 2.02 EQUIPMENT

A. The Subcontractor will furnish and maintain in good condition all equipment and facilities as required for the proper execution and inspection of the Work. All equipment and facilities will be on site and approved by the Purchaser before work will be permitted to begin.

### PART 3 - CONSTRUCTION REQUIREMENTS

#### 3.01 SITE PREPARATION AND RESTORATION

##### A. Rights-of-Way and Easements

1. Rights-of-way and/or easements as shown on the Plans and/or rights-of-way/easement plats are provided by the City to the Subcontractor for construction of sanitary sewer facilities. The Subcontractor will confine his construction activities to these areas. The Subcontractor will be responsible for obtaining written agreements for use of private property outside City acquired rights-of-way/easements for such purposes as storage of material and equipment and access to the construction site. The Subcontractor will immediately provide a copy of all such written agreements to the City and Purchaser upon obtaining the same.

##### B. Clearing of Rights-of-Way and Easements

1. The Subcontractor will confine his clearing of rights-of-way and easements to the least area necessary for construction of facilities shown on the Plans. The Subcontractor will protect as many trees and shrubs within the area as possible. Where necessary for construction the Subcontractor will clear all live and dead vegetation and growth, pole stubs, logs, and other objectionable material. Cleared material will be removed to within 3 inches of existing ground. This work will be done well before excavation operations but only after erosion controls have been placed.

##### C. Location of Existing Obstructions

1. Locations of obstructions shown on the Plans are approximate and are not intended as an accurate location of such obstructions. Obstructions not shown on the Plans but encountered by the Subcontractor will be removed and replaced in their original state or protected by the Subcontractor at no additional cost to the Purchaser.

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D. Removal of Obstructions

1. The Subcontractor will demolish and remove all structures and structure foundations, abandoned vehicles, appliances, and rubbish within the right-of-way/easement limits necessary for the performance of the work.

E. Protection of Obstructions Outside Easement Limits

1. The Subcontractor will protect and avoid damage to all trees, shrubs, plants, fences, structures, and all other objects outside the right-of-way/easement limits shown on the Plans and/or Plats due to construction operations. All damage will be repaired or restored at the Subcontractor's expense. Particular attention will be paid to avoid damage to trees, shrubs, bushes, and private property located next to rights-of-way/easements. No trees, plants, or other objects may be removed outside such limits without written permission of the property owner.

F. Special Protection of Obstructions Inside Easement Limits

1. Wherever the underground installation of sanitary sewer facilities will go through surface improvements previously made by the City, other governmental bodies, or property owners, the Subcontractor will be responsible for their protection and preservation. This responsibility includes the removal and storage of such improvements to allow replacement and restoration as close as possible to the undisturbed condition.

G. Disposal of Debris

1. All trees, brush, logs, snags, leaves, sawdust, bark, and refuse will be collected and disposed of according to the City Code of Ordinances at the expense of the Subcontractor. There will be no separate pay item for disposal of debris. Debris will be removed from the site when practical and will not be left until the completion of the contract. Burning of debris is not allowed. When material is to be disposed of outside the easement, the Subcontractor will first obtain written permission from the property owner on whose property the disposal is to be made and will file a copy with the Purchaser. Unless otherwise provided in the Contract Documents, the Subcontractor will arrange for disposing of such material outside the right-of-way/easement. No debris will be deposited in wetlands.

H. Replacement of Fences

1. Any fences disturbed inside the right-of-way/easement limits will be replaced or restored to their original or better condition. Any fences removed will be replaced in their original location. Fences in such poor condition that they cannot be taken down and rebuilt with the same material will be replaced with new fence material similar in original quality, size, construction, and appearance to the removed fence. Exceptions to this requirement will be allowed if written releases are obtained from the property owners by the Subcontractor and submitted to the Purchaser.

I. Restoration of Turfed Areas

1. All areas will be restored as nearly as practicable to their original condition. Finished lawn areas where soil has been deposited will be cleared to the level of the existing sod and then raked and watered. Areas where sod has been damaged, destroyed, or ruts have been filled will be resodded. After final restoration of the settled trench surfaces, trench areas and areas regraded as part of the construction will be resodded, unless otherwise shown on the Plans or directed by the Purchaser. New sod shall consist of live, dense, well rooted growth of Bermuda grass, free from Johnson grass, nutgrass, and other obnoxious grasses or weeds, well suited for

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the intended purpose and for the soil in which it is to be planted. All sod shall be cleanly cut in strips having a reasonably uniform thickness. Subcontractor shall water sodded areas as frequently as required for a period of at least two weeks and shall apply fertilizer as necessary. Sod must be living at the time of final acceptance of the project.

3.02 EXCAVATION

A. All excavation performed under this Section including trench excavation, structure excavation, and channel excavation, but excluding undercut excavation, will be considered unclassified excavation despite the nature of the material and objects excavated and will not be measured or paid for separately except as specifically noted. Pavement removal and replacement will be accomplished as specified in Specification Section 02950.

B. Trench Excavation

1. All trenches will be open cut unless otherwise shown on the Plans. Tunneling, boring, or jacking may be allowed by written permission of the Purchaser.

2. Trenches may be excavated by machinery to a depth that will not disturb the finished subgrade. The remaining material will be hand excavated so that the pipe is bedded on a firm, undisturbed subgrade.

3. No more than 300 feet of trench will be opened ahead of the completed sanitary sewer, nor will more than 100 feet be left unfilled except by written permission from the Purchaser. In special cases the Purchaser may limit the distance to which the trench may be opened by notifying the Subcontractor in writing.

4. The width of trenches below a level 1 foot above the outside top of pipe will be at least 6 inches but not more than 12 inches on each side of the outside of the pipe for all sizes up to and including 16 inches in diameter. A maximum trench width dimension for these pipe sizes will be 36 inches. For 18 inch diameter pipes, the width of trenches below a level 1 foot above the outside top of pipes will be at least 6 inches on each side of the pipe, with a maximum trench width of 42 inches. For pipe sizes more than 18 inches, the width of trenches below a level 1 foot above the outside top of the pipe will be at least 12 inches but no more than 15 inches on each side of the outside of the pipe. If the trench width at or below 1 foot above the top of pipe exceeds the width specified, provisions will be made at the Subcontractor's expense to compensate for the additional load upon the pipe.

5. The sides of the trench will be as nearly vertical as possible. The bottom of the trench will be carefully graded, formed, and aligned according to SARP10 Trench Cross Section Showing Terminology Figure and to the satisfaction of the Purchaser before sanitary sewers are laid.

C. Other Excavation

1. Undercut Excavation:

Undercut excavation will consist of removing and disposing of unsatisfactory material below the grade established on the Plans for sanitary sewers, structures, and manholes. No undercut excavation will be done without prior authorization of the Purchaser. The limits of undercut excavation will be determined by the Purchaser who will be present during the undercut operations.

2. Undercut areas will be backfilled with No. 67 limestone or other aggregate approved by the Purchaser to the grade established on the Plans to produce a suitable Foundation. The backfill will be placed in 6 inch maximum lifts and compacted to 95 percent of maximum density at plus or minus 2 percent of optimum moisture content as determined by Laboratory Standard Proctor

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Test (ASTM D 698) or a minimum relative density of 0.75.

3. **Unauthorized Excavation Below Subgrade or Outside Limits:**

Any unauthorized excavation and subsequent removal and backfilling beyond the lines and grades shown on the plans will be at the Subcontractor's expense. The excess space between the undisturbed bottom and sides of the excavation and subgrade limits shown on the Plans will be backfilled according to Specification Section 02530 Paragraph 3.02.C.2.

D. Change in Location and Grade

1. If the Purchaser orders in writing that the location or grade of a proposed sanitary sewer facility be changed from that shown on the Plans, the following provisions will apply. If the change is made before excavation work has begun and the item being constructed is covered in the Proposal Sheet(s) by pay items with appropriate depth classifications, the appropriate pay item will apply. If the facility being constructed is not covered in the Proposal Sheet(s) and if the average excavation per linear foot at the changed location or grade is within 10 percent of the original Plan quantity, there will be no change in the unit price for this work. If the average excavation per linear foot at the changed location varies more than 10 percent above or below original Plan quantities, a Change Order will be prepared to cover the new work. For purposes of comparing changed quantities with Plan quantities, a 1 foot long strip will be calculated from natural ground line to invert along both the revised and original locations. These calculations will then be multiplied by the proper lengths to determine the total cost.

2. If the change is made after excavation has already begun on the original Plan location, the procedures described above will apply to payment for work along the changed location. If abandonment of an existing excavation is required due to a change by the Purchaser, a Change Order will be prepared covering the backfilling and restoration of the abandoned excavation. Backfilling and restoration of the abandoned excavation will be accomplished according to the appropriate section of these Specifications.

3. Filling a portion of existing excavation to meet changed grades will be accomplished according to Specification Section 02530 Paragraph 3.11.

4. If a change in a location and/or grade is authorized in writing by the Purchaser at the written request of the Subcontractor, the Subcontractor will not receive any additional compensation for the changed work. Backfilling and restoration of abandoned excavation work will be accomplished totally at the Subcontractor's expense. If changes requested by the Subcontractor result in reduced lengths and/or depth of excavation, the revised quantities using Proposal unit prices or Change Orders as appropriate will be used to develop payment.

E. Disposition of Excavated Material

1. Excavated material suitable for backfill will be stored no closer than 2 feet from the edge of the excavation. Excavated material will not obstruct crosswalks, sidewalks, driveways, street intersections, nor interfere unreasonably with travel on streets. Gutters or other surface drainage facilities will not be obstructed. The Subcontractor must provide access to fire hydrants, mail boxes, sewer and conduit manholes and similar utility or municipal service facility as required. Excavated material intended for backfill will be stored in a way that minimizes loss of excavated material due to erosion. The Subcontractor shall comply with all applicable OSHA regulations and City of Memphis Storm Water Ordinances. 2. Unless otherwise directed, all excavated material that will not be used for backfilling or restoration will be removed from the site and disposed of by the Subcontractor. If the Subcontractor proposes to store or place such excess excavated material upon any private property, written consent of the property owner or owners must be obtained by the Subcontractor in advance. A certified copy will be given to the Purchaser. No surplus or excess material will be deposited in any stream channel nor anywhere

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that would change preconstruction surface drainage.

F. Control of Water

1. The Subcontractor will keep all excavations free of water. If the trench subgrade consists of good soil in good condition at the time of excavation, it will be the Subcontractor's responsibility to maintain it in suitable condition. Dams, flumes, channels, sumps, or other work and equipment necessary to keep the excavation clear of water will be provided by the Subcontractor. Dewatering of trenches, will be incidental to trench excavation. The Subcontractor will avoid producing mud in the trench bottom by his operations. If necessary or so ordered by the Purchaser, the Subcontractor will remove any soil that becomes unacceptable and replace it with limestone or other approved aggregate at his own expense to maintain a firm, dry base.

2. Pipe embedment, laying, jointing, and the placing of concrete or masonry will be done in a water free trench or excavation. Trenches will be kept clear of water until pipe joints, concrete and masonry have set and are resistant to water damage. The water will be disposed of in a manner acceptable to the Purchaser.

3. All gutters, pipes, drains, conduits, culverts, catch basins, storm water inlets, ditches, creeks, and other storm water facilities will be kept in operation, or their flows will be satisfactorily diverted and provided for during construction. Any facilities disturbed during construction will be restored to the satisfaction of the Purchaser.

G. Excavation Around Obstructions

1. The Subcontractor will perform all excavation by hand where excavation by machinery would endanger trees, structures, or utilities that otherwise might be saved by hand excavation.

2. The Subcontractor will cautiously excavate test holes to find the limits of underground obstructions anticipated within the excavation. When a water pipe, gas pipe, other sanitary sewer, storm drain, or similar utility comes within the limits of the trench, such facilities will be properly supported.

H. Excavation for Manholes and Special Structures

1. The Subcontractor will be responsible for performing the Work according to the lines and elevations shown on the Plans or as directed by the Purchaser. The Subcontractor will excavate as required for all structures with foundations carried to firm, undisturbed earth at the elevation of the underside of the structure.

2. The outside dimensions of excavations for manholes and special structure will be at least 12 inches greater than the outside of the masonry or concrete work to permit backfilling around the structure.

3. Where structures are to be built in street rights-of-way or paved areas, the excavation will not exceed 2 feet from the outside of the masonry or concrete work. If the excavation exceeds this limit, the Subcontractor will be required to backfill the entire space around the structure with pit run gravel compacted as specified in Specification Section 02530 Paragraph 3.11.B.

I. Special Protection

1. Treacherous Ground:

When running sand, quicksand, or other treacherous ground is encountered, the work will be carried on with the utmost urgency and will continue day and night should the Purchaser so direct.

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**2. Sheeting and Shoring:**

The Subcontractor will furnish, place, and maintain sheeting and shoring as required to support the sides of any excavation to prevent earth movement that could endanger the workers or public and to prevent damage to the excavation, adjacent utilities or property. The Subcontractor will place this sheeting and shoring without the Purchaser's instructions.

3. Sheeting will extend below structure invert a sufficient depth to assure adequate support. In the installation of sheeting, the use of vibratory type pile drivers (as opposed to impact type) will be limited to sheeting driven no greater than 5 feet below the invert. The sheeted trench width, as measured between those faces of the sheeting in contact with the earth trench wall, will not exceed the maximum width of a trench per Specification Section 02530 Paragraph 3.02.B. Walers and struts will be designed and installed to present no obstructions to proper placement of the pipe, pipe embedment, cradle or encasement, and they will not interfere with the satisfactory installation of the pipe.

4. Sheeting, bracing, and shoring will be withdrawn and removed as the backfilling is being done, except where the Purchaser permits the material to be left in place. The Subcontractor will cut off sheeting left in place at least 2 feet below the surface and will remove the cut off material from the excavation.

5. All sheeting, bracing, and shoring which is not left in place under this provision will be removed in a way that will not endanger the completed work or other structures, utilities, storm drains, sewers, or property. The Subcontractor will be careful to prevent the opening of voids during the extraction process.

6. If sheeting and shoring are not specifically required on the Plans or in the Specifications, steel drag shields or trench boxes may be used subject to the authorization of the Purchaser. Voids left by the advancement of the shield will be carefully backfilled and compacted following trench backfill requirements.

**7. Excess Width of Trench:**

If the Subcontractor is permitted to use equipment that results in wider trenches than specified, approved methods will be used around the pipe to resist the additional load caused by the extra width. The dimensions of the cradle or other methods will be specified by the Purchaser. The Subcontractor is responsible for meeting all applicable OSHA requirements. No extra compensation will be allowed for the additional material or work. Excess width trenches for semi-rigid and flexible pipe will be backfilled and compacted according to ASTM D 2321, and no concrete cradle will be used.

**8. Blasting:**

Blasting will be undertaken only after the Subcontractor has received written authorization from the Purchaser. With respect to the use of explosives in blasting, the Subcontractor will obtain all necessary permits and comply with all laws, rules, and regulations of the federal, state, City, and the insurer governing the keeping, storage, use, manufacture, sale, handling, transportation, or other disposition of explosives. The Subcontractor will obtain additional insurance covering the use of explosives with limits and coverage as specified by the Purchaser. All operations involving the handling, storage, and use of explosives will be conducted with every precaution under the supervision of a properly licensed individual. The Subcontractor will take special precautions for the proper use of explosives to prevent harm to human life and damage to surface structures, utilities, storm drains, sewers, or other subsurface structures. The Subcontractor will advise the Purchaser in advance when charges are to be detonated. Blasts will not be fired until all persons in the vicinity have had ample notice and have reached positions of safety.

9. Sanitary sewer construction will be carefully protected from all blasts, and all excavations requiring blasting will be fully completed at least 30 feet ahead of the laying of the pipe. The

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mouth of the pipe will always be covered with a board or other plug carefully fitted to the pipe to prevent earth or other substances from entering.

10. After a blast is fired, the Subcontractor will thoroughly scale the excavation. All loose, shattered rock or other loose material that may be dangerous to the workers, pipe, or structure will be removed and the excavation made safe before proceeding with the work. The fact that the removal of loose, shattered rock or other loose material may enlarge the excavation beyond the required width will not relieve the Subcontractor from making such removal and filling the extra space. The Subcontractor will not be entitled to extra compensation therefore.

11. Underpinning:

When excavations require underpinning of existing structures, the Subcontractor will submit shop drawings of underpinning details to the Purchaser for review before commencement of excavation below the foundation of the structure. Review of underpinning details by the Purchaser will not relieve the Subcontractor of his responsibility for protection of the structure and its contents.

J. Existing Utilities

1. Location:

The Plans show the readily available record of location of existing structures and facilities both above and below the ground, but the Purchaser assumes no responsibility for the accuracy or completeness of this information. Utility service connections are not shown on the Plans, but can be expected in built-up areas, and if relocating them is necessary, it will be the Subcontractor's responsibility to arrange for the relocation with the owner or owners of the utilities.

2. Protection

The Subcontractor will protect any storm drain, sewer, or utility within the limits of the construction. The Subcontractor will proceed with caution and will use every means to establish the exact location of underground structures and facilities before excavating in the vicinity. The Purchaser will not be responsible for the cost of protection or repair or replacement of any structure, pipe line, conduit, service connection, or similar facility broken or damaged by the Subcontractor's operations. All water and gas pipes and other conduits near or crossing the excavation will be properly supported and protected by the Subcontractor.

3. If the construction requires the removal and replacement of any overhead wires or poles, underground pipes, conduits, structures or other facilities, the Subcontractor will arrange for such work with the Owner or Owners of the facilities. No additional payment will be made by the Purchaser for this work.

4. Service Connections:

Sewer and utility services between mains and buildings will be maintained and adjusted as necessary by the Subcontractor to provide as nearly a continuous operation as can be expected. This will be accomplished in any way that the Subcontractor chooses, provided the individual service is not interrupted for more than two consecutive hours. The occupants will be notified by the Subcontractor at least six hours before such service interruptions. When a break occurs, the Subcontractor will notify the affected occupant(s) of the probable length of time that the service will be interrupted.

5. If existing underground facilities or utilities require removal and replacement for the performance of this work, all replacements will be made with new material conforming to the requirements of these Specifications. If not specified, the material will be as approved by the Owner.

6. The removal and replacement of water services to adapt to new construction will be the



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Subcontractor's responsibility within the limits where the new service line grade blends smoothly with the existing service line grade.

7. The removal and replacement of sewer house connections to adapt to new construction will be the Subcontractor's responsibility from the sewer main to a point where the new grade and existing grade can be matched.

8. The Subcontractor will be responsible for any damage to the sewer house connection because of his operations. The Purchaser does not guarantee the number, size, condition, nor length of adjustment necessary to bring a service to a new grade.

**3.03 SEWER PIPE INSTALLATION**

**A. General**

1. Sewer pipe and pipe embedment will be constructed as shown on the Plans. It will be the Subcontractor's responsibility to find all underground utilities before construction to insure there are no conflicts with the proposed line and grade. The Subcontractor's surveyor shall verify the base information on the City's plans prior to commencement of construction. Any discrepancies in the plans shall be reported to the Purchaser immediately. If approved by the Purchaser, minor changes in the alignment or grade will be permitted to avoid underground facilities, if straight alignment can be maintained between manholes. If minor changes in line or grade cannot avoid a conflict with the existing utility, the Subcontractor will arrange with the owner of said utility to have it adjusted as required to accommodate the proposed sewer at no additional expense to the Purchaser.

**B. Modifications of Existing Sanitary Sewer Facilities**

**1. Maintenance of Flow:**

Where existing sewer lines are being modified, the Subcontractor will arrange his work so that sewage flow will be maintained during the construction period with no discharge of sewage into the open trench, and no back up of sewage in the existing line. The Subcontractor will provide necessary bypass pumping capacity to carry flow downstream of the section to be modified.

**2. Abandonment of Sewer Pipe:**

Sewer pipe called for in the Specifications or Plans to be abandoned will be sealed at each end for a minimum distance of 18 inches, or one-half the diameter of the pipe, whichever is greater. Unless otherwise specified, the pipe will be sealed with a brick bulkhead and/or acceptable cement grout to form a solid watertight plug completely bonded to the pipe. Any sewer manholes to be abandoned will be abandoned per Specification Section 02531 Paragraph 3.03.B.

3. The Subcontractor will be allowed to remove pipe to be abandoned if wanted. If the Subcontractor elects the removal method, all associated costs will be included in the cost for other Pay items.

**4. Connection to Existing Manholes:**

The Subcontractor will cut suitable openings into existing manholes or remove existing pipe to accommodate the sewer pipe at the proper elevation, location, and direction, as indicated on the Plans. Care will be used to avoid unnecessary damage to the existing manhole.

5. All loose material will be removed from the cut surfaces that will be completely coated with nonshrinking grout before setting the pipe. Before inserting the pipe, a sufficient thickness of grout will be placed at the bottom and sides of the opening for proper bedding of the pipe. For semi-rigid and flexible pipe installations a water stop as approved by the pipe supplier will be installed on the pipe according to the manufacturer's recommendations. After setting, all spaces

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around the pipe will be solidly filled with nonshrinking grout and neatly pointed up on the inside to present a smooth joint, flush with the inner wall surface. Any necessary revisions on the existing manhole invert will be made to provide a smooth, plastered surface for properly channeled sewage flow from the new connection. Plaster on the exterior of brick manholes will be repaired with nonshrinking grout. Particular care will be given to insure that the earth sub-base and bedding next to the manhole will provide firm solid support to the pipe.

**6. Removal of Sewer Pipe:**

Existing pipes and manholes to be removed and their locations will be shown on the Plans. Existing sewer pipe and manholes that must be removed to excavate for the proposed sewer will be included in the cost of the proposed sewer pipe and no additional compensation will be made to the Subcontractor. The City reserves the right to retain or reject salvage of any material encountered. All remaining material becomes the property of the Subcontractor who will be responsible for properly disposing of the same.

**3.04 PIPE EMBEDMENT**

- A. Pipe embedment will be defined as that material supporting, surrounding and extending to 6 inches above the top of the pipe. Pipe Embedment for sewer pipe will conform to the requirements given below for Class A, B.1, B.2, or C, whichever is shown on the Plans. If the class of pipe embedment is not shown, a minimum of Class B.1 (for concrete and ductile iron pipe) or B.2 (for fiberglass reinforced polymer mortar pipe, PVC, and HDPE pipe) will be provided as specified below. At the direction of the Purchaser or as shown on the plans, sewer pipe and Class B.1 or B.2 will be encapsulated in geotextile fabric meeting the following requirements:

Physical Property	Test Method	Acceptable Test Result
Tensile Strength, wet, lbs	ASTM D-1682	200 (min)
Elongation, wet, %	ASTM D-1682	40 (min)
Coefficient of Water Permeability, cm/sec	Constant Head	0.03 (min)
Puncture Strength, lbs.	ASTM D-751	100 (min)
Pore Size - EOS U.S. Standard Sieve	Corps of Engineers CW-02215	40 (max)

**B. Class A - Concrete Cradle**

1. Class A pipe embedment for sewer pipe will consist of a continuous concrete cradle constructed in conformity with the details shown on the plans or as directed by the Purchaser. Class A pipe embedment will only be used for rigid pipe.

**C. Class B.1-Crushed Limestone**

1. Class B.1 pipe embedment will be number 67 crushed limestone. Pipe 4 inches to 24 inches in diameter will be bedded on 4 inches of bedding material. Pipe 27 inches to 48 inches in diameter will be bedded on 6 inches of bedding material. Pipe embedment for pipes larger than 48 inches in diameter will be by design based on anticipated soil conditions. After pipe installation, crushed limestone will then be tamped under the haunches continuing in layers not more than 6 inches in loose thickness around the pipe to the spring line. The remainder of the installation will be as outlined in Specification Section 02530 Paragraph 3.11. Unless otherwise instructed, concrete and ductile iron pipe will be bedded in Class B.1 pipe embedment.

**D. Class B.2-Crushed Limestone**

1. Class B.2 pipe embedment will be number 67 crushed limestone. Pipe 4 inches to 24 inches

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in diameter will be bedded on 4 inches of number 67 crushed limestone. Pipe 27 inches to 48 inches in diameter will be bedded on 6 inches of bedding material. Pipe embedment for pipes larger than 48 inches in diameter will be by design based on anticipated soil conditions. After pipe installation, crushed limestone will then be tamped under the haunches and continued in layers not more than 6 inches in loose thickness around and above the pipe to a level 6 inches above the outside top of the pipe. The remainder of the installation will be as outlined in Specification 02530 Paragraph 3.11. Class B.2 pipe embedment will be used for all flexible pipe including fiberglass reinforced polymer mortar pipe, PVC and HDPE.

E. Class C-Sand

1. Class C pipe embedment will only be used when specified by the Purchaser or construction plans. The remaining depth of the trench will then be backfilled and compacted as specified in Specification Section 02530 Paragraph 3.11.

3.05 PIPE LAYING

A. Inspection Before Laying

1. All pipe will be inspected on delivery. Pipe that does not conform to the requirements of these Specifications or is not suitable for use will be rejected and immediately removed from the work site.

B. Preparation of Pipe Ends

1. All surfaces of the pipe to be joined will be clean and dry. All necessary lubricants, primer, adhesives, and similar material will be used as recommended by the pipe or joint manufacturer's specifications.

C. Care During Hoisting, Placing, And Shoving Home

1. Equipment used to handle, lay, and join pipe will be equipped and used as to prevent damage to the pipe. All pipe and fittings will be carefully handled and lowered into the trench. Damaged pipe or jointing material will not be installed.

D. Direction of Work

1. The laying of pipe will be commenced at the lowest point. The bell or grooved end will be laid upgrade. All pipe will be laid with ends abutting and true to line and grade. They will be carefully centered so that when laid they will form a sewer with a uniform invert.

E. Uniform Pipe Bearing

1. Special care will be taken to insure that the pipe is solidly and uniformly bedded, cradled, or encased according to the Plans. For pipe with a bell that is larger than the barrel of the pipe the bedding material will be removed to a depth that will provide continuous support for the bell and barrel. No pipe will be brought into position for joining until the preceding length has been bedded, joined, and secured in place. Where a concrete cradle is required, the pipe will be supported at no more than two places with masonry supports of minimum size sufficient to provide the required clearance and to prevent displacement during placing of concrete.

F. Alignment and Grade

1. Each piece of pipe will be checked for vertical and horizontal alignment immediately after being laid. All adjustments to alignment and grade must be made by scraping away or filling in

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under the barrel of the pipe and not by wedging or blocking up any portion of the pipe or striking the pipe to drive it down. Curved alignments will not be allowed except as directed by the Purchaser.

G. Backfilling to Secure Pipe

When the joint is made, sufficient backfill material will be simultaneously placed along each side of the pipe to prevent moving the pipe off line and grade. Particular care will be used to prevent disturbance or damage to the pipe and the joints during backfilling.

H. Flotation and Water in the Trench

1. The Subcontractor will take all necessary precautions to prevent flotation of the pipe in the trench. Water will not be allowed to rise in the trench. The Subcontractor will use well points, sump pumps, or another approved method of dewatering as required to lower the water table below the bottom of the excavation while minimizing the migration of fines from the surrounding area. The Subcontractor will make a request to the Purchaser and receive approval prior to the use of special dewatering equipment other than well points or sump pumps. Dewatering operations are considered incidental to the work and no additional compensation will be made to the Subcontractor.

I. Open Ends

1. Whenever pipe laying is stopped for any significant length of time, such as at the end of a workday, the unfinished end will be protected from damage and a temporary tight fitting plug or bulkhead will be placed in the exposed ends of the pipe to keep soil or other debris from entering the pipe.

J. Concrete Cradle Section next to Manhole

1. The pipe will be supported from the manhole wall to the limits of the manhole excavation in a normal sewer trench with a concrete cradle, structurally continuous with the manhole base slab or footing. Cost for this work is incidental to the cost of the pipe installation.

K. Cutting Pipe

1. Cutting will be in a neat workmanlike manner at right angles to the pipe axis without damage to the pipe. Observe specifications regarding joint locations. Smooth the cut end by power grinding or filing to remove burrs and sharp edges. Repair lining of the pipe as required.

L. Wyes and Special Fittings

1. Wyes, stubs, reducers, fittings, or other special pipes will be installed as shown on the Plans or where ordered by the Purchaser. The fittings and special pipes will be made of a compatible material, type, and class and/or strength designation as the pipe and installed as required by the Plans and Specifications. The cost for providing and installing the above items is incidental to the cost of the pipes.

M. Valves

1. Valves and appurtenant fittings will be installed as shown on the Plans or where directed by the Purchaser.

2. Check valves and gate valves will be installed on either flanged or mechanical joint ductile iron pipe.

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3. Air release, vacuum relief and combination air valves larger than 3 inches in diameter will be installed on either flanged or mechanical joint ductile iron pipe. A gate valve conforming to section 2.01.Q shall be installed to isolate these air valves from the force main.

4. Air release, vacuum relief and combination air valves 3 inches in diameter and smaller will be installed on a ductile iron tap 'T' fitting. A ball valve conforming to section 2.01.Q shall be installed on a 6" threaded nipple between the 'T' and the air valve.

**3.06 PIPE JOINTS**

**A. General**

1. Pipe will be jointed immediately following the laying of each section. No pipe section will be left overnight which has not been completely jointed to the preceding pipe section in conformance with these Specifications.

2. The following provisions will apply to insure tight and sound joints:

a. The joint will be placed with special care to avoid breaking joints and to leave gasket, if required, in proper position.

b. All pipe 12 inches in diameter or larger will have dead weight held by crane while being lined up and pushed home.

c. Pipe will be pushed home with a constant and even force and not jarred home by the momentum of a moving force that will place an impact load on pipe.

d. Cement and lubricant will be used as recommended by the manufacturer and designated by the Purchaser.

**B. Compression Joints**

1. The two ends to be joined will be thoroughly cleaned and a compression gasket compatible with the type of pipe to be joined will be at the position recommended by the pipe manufacturer.

2. Lubricant recommended by the gasket manufacturer will be liberally applied to the gasket and both ends immediately before pipe ends are joined. The upstream pipe will be positioned such that the spigot may enter the bell squarely. The pipe being laid will be pushed home and the gasket position checked with a feeler gauge before installation of the next section. Flat, unconfined gaskets on concrete pipe will be cemented to the spigot at the position recommended by the pipe manufacturer.

**C. Mechanical Joints**

1. The two ends to be joined will be thoroughly cleaned with a wire brush and the plain end, socket end, and gasket will be brushed with soapy water. The end will be centered in the socket and adequate anchorage will be provided to hold the pipe in position until the joint can be completed. When deflecting pipe from a straight line is necessary, the deflection will be made after joint assembly and before tightening bolts. Pipe deflection will not exceed that specified by ANSI C 600.

2. When tightening bolts, it is essential that the gland be brought up toward the pipe flange evenly, maintaining approximately the same distance between the gland and the face of the

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flange at all points around the socket. All bolts will be torqued to the required range recommended by the pipe manufacturer. Over stressing of bolts will be avoided. Gauge lines on the spigot end will be checked following assembly to ensure proper positioning of bell and spigot has been accomplished.

3. Any joints not properly positioned will be disassembled, cleaned, and reassembled as previously indicated.

D. Flanged Joints

1. The two ends to be joined will be thoroughly cleaned with a wire brush. Bolt holes on each pipe flange to be joined will be aligned and bolts inserted. Bolts will be torqued evenly by alternating tightening of bolts opposite one another until all bolts are torqued to the recommended pressure.

E. Solvent Cement Joints

1. The two ends to be joined will be thoroughly cleaned and primer liberally applied to the outside of the spigot within the joint insertion limits and inside the bell in conformance with the manufacturer's recommendations. Cement will be applied immediately to the same surfaces as the primer and the pipe joined within one minute. A sufficient quantity of cement will be applied to form a bead of excess cement around the full circumference of the joint when the spigot is fully inserted. The spigot end will be inserted to the insertion stop mark and rotated one-fourth turn. Avoid disturbing the joint until cement has had ample time to set.

F. Restrained Joints

1. Restrained push-on joints are to be used as specified on the plans or by the Purchaser. These special joints will be installed as specified by the manufacturer. The length of the pipe to be restrained will be determined by the Purchaser based on pipe size, internal pressure, depth of cover, and soil characteristics around the pipe.

3.07 PIPE CAPS AND PLUGS

A. Wyes, stubs, or other fittings installed in the pipe for future connections will be closed at the open end. For pipes 21 inches in diameter or smaller, an approved cap or plug will be installed in the bell or socket using the same type joint or jointing material as required for the sewer. For pipes larger than 21 inches in diameter, temporary approved masonry bulkheads of the thickness required by the Plans and Specifications to close the open end may be substituted for stoppers. Care in backfilling will be used so that such closure and its seal will not be disturbed. This stopper will be jointed so that it may be removed later without injury to the pipe itself. Work and material is incidental to the cost of the pipe installation.

3.08 SERVICE CONNECTIONS

A. All service connections for pipe diameters up to and including 12 inches will be 6 inch diameter in-line wye connections unless indicated otherwise on the Plans. Service connections on pipes larger than 12 inches in diameter will not be allowed. Saddles will not be used on new construction. Although the general location of connections may be shown on the drawings, the actual location will be determined by the Subcontractor, subject to approval by the Purchaser. Connections for undeveloped property will generally be at the center of the lot. Connection locations for developed property will be coordinated with the property owner. The quantities shown on the proposal sheet are only approximate and are subject to change. The depth of connections at the property line will be determined by the Purchaser. Building connections will be laid on no less than a 1 percent grade for 6 inch diameter connections unless otherwise directed by the Purchaser. Each building connection

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will be accurately recorded by station offset and depth on the as-built drawings and will be furnished to the Purchaser. Unless authorized by the Purchaser in writing, or shown on the drawings, building connections will not be tied into new or existing manholes. When service connections are tied into manholes at an elevation greater than 2 feet above the manhole invert, the service will be constructed as a drop construction as specified in Specification Section 02531 Paragraph 3.08.

B. Service connections will be laid in open trenches except where tunneling may be necessary under existing curbs, sidewalks, or pavements. In all such instances, a shaft must be excavated at the end of the connection for inspection purposes and measurement of length and depth. All service connections will extend to the right-of-way or easement limits. The service connection will be installed in conformance to the City of Memphis Standard No. SST-16.

**3.09 PIPE ENCASEMENT, COLLARS, AND THRUST BLOCKS**

A. General

1. Concrete will be Class "C" Concrete as specified in Specification Section 03050. All concrete will be placed, cured, and protected according to the applicable paragraphs of Specification Sections 03050 and 03310. Pipe alignment will be inspected immediately following concrete placement and any misalignment caused by the placement of concrete will be corrected before the initial set. Concrete will be protected against water until completely cured.

B. Pipe Encasement

1. Concrete encasement for pipes is to be used at the locations shown on the Plans or as directed by the Purchaser. Concrete will be Class C and will be reinforced as required. All pipe requiring encasement will be blocked at each joint using masonry supports of a minimum size sufficient to provide the required clearance and to prevent displacement during placing of concrete. Concrete will be placed on either side of the pipe in approximately equal amounts to prevent movement of the pipe. Concrete encasement is to be rectangular in section with a thickness of  $\frac{1}{2}$  the pipe diameter between the outside edge of pipe and the outside of encasement at the closest point unless shown otherwise on the Plans. The absolute minimum thickness for concrete encasement shall be 6 inches regardless of pipe size.

C. Pipe Collars

1. Concrete pipe collars are to be used to join pipe ends that cannot be joined with prefabricated joints. Concrete will be Class C and will be reinforced when shown on the Plans. Concrete pipe collars will be constructed at the locations and to the dimensions shown on the Plans or as directed by the Purchaser. Pipes being joined will be blocked and supported laterally to prevent movement during placing or curing of concrete. Rubber water stops will be placed on each pipe before pouring the concrete collar. Fernco or equal mechanical coupling will be used for pipe connectors 16 inches and smaller.

D. Thrust Blocks

1. Concrete thrust blocks are to be used to resist internal thrust pressures at bends and fittings in force mains at the locations shown on the Plans or as directed by the Purchaser. Concrete will be Class C and will be reinforced when shown on the Plans. Thrust blocks will conform to the dimensions shown on the Plans or City of Memphis Standard SST-12. Load distribution type thrust blocks will be poured continuously from the force main to the undisturbed trench face. Backfill will not be placed as backing material for load distribution type thrust blocks.

2. All concrete will be poured in a way that leaves the pipe joint accessible for caulking or

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tightening of bolts. Care will be taken to permit the concrete to cure long enough to develop sufficient strength before the concrete is required to withstand the thrust. The area of the concrete bearing on the main or the restraining mass must be large enough to prevent over stressing the concrete.

3. If a concrete mass is used, a form may be necessary to contain the mass to provide access to joints or to insure the required bearing area. Generally, some form work is required for the mass of concrete necessary for blocking on mains sized 12 inches and larger. In poor soil, forming the concrete mass to construct the necessary bearing surface will be necessary. Instead of this construction, a restrained joint may be used.

4. Thrust blocks will be included in the linear foot price for the force main.

**3.10 INVERTED SIPHONS**

A. Each siphon will include inlet, outlet, and any intermediate manholes where shown on the Plans with all foundations, pipes, and pipe encasement and other appurtenances. Pipe to be included in the cost of the siphon is to be all pipe, fittings and specials between the center of the inlet manhole and the center of the outlet manhole.

B. The Subcontractor will construct cofferdams, temporary bulkheads, perform all pumping and other work necessary to protect the siphon during construction. The Subcontractor will be required to maintain a dry trench during construction, and will never be permitted to lay pipe or place concrete with water in the trench. Trenches will be kept free from water until the material in the joints and masonry has sufficiently hardened.

C. Unless otherwise specified, inverted siphon pipe will be lined ductile iron Class 50 pipe and fittings as specified in Specification Section 02530 Paragraph 2.01.H fabricated for push-on type joints or HDPE conforming to Specification Section 02530 Paragraph 2.01.M. The siphon pipes will be encased in concrete at the locations and to the dimensions shown on the Plans or Design Standards. The excavation, pipe embedment, laying, jointing, pipe encasement, and backfill operations will conform to the applicable sections of this Specification.

D. When shown on the Plans, flexible joint ductile iron pipe will be used instead of push-on joint pipe as shown on Design Standards. Flexible joint pipe will be laid such that the maximum joint deflection as specified by the pipe manufacturer for each joint is not exceeded.

E. The inlet, outlet, and any intermediate manholes will be constructed according to the requirements of Specification Section 02531.

F. The inlet and outlet manhole inverts will be carefully shaped to conform to the inlet and outlet pipes and cause the least possible resistance to flow. The inlet manhole will have an invert weir constructed to contain low flows to a single siphon pipe. The invert weir will be level across the top and constructed to the elevation shown on the Plans. The outlet manhole invert will be formed to reduce backflow into the inactive siphon pipes.

**3.11 BACKFILLING**

A. General

1. After sanitary sewer facilities have been bedded and installed according to these Specifications and upon permission of the Purchaser, the backfill may be placed. Backfilling operations will continue following as closely behind pipe installation as practical. All backfill will be placed in uniform horizontal layers. Pushing backfill material down a ramp into excavated areas will not be permitted. No trash will be allowed to accumulate in the space to be backfilled.



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Particular care will be taken to avoid allowing wood to be included in the backfill, other than sheeting and shoring that has been approved to be left in place.

2. The Subcontractor will be responsible for the condition of the trenches and filled areas during the contract and warranty period. The Subcontractor will maintain frequent inspection of the same. Anytime during the 12-month warranty period the trenches or filled areas settle and sunken places appear, the Subcontractor will be required to refill these sunken places when they are discovered with suitable material and will replace all damaged curb, gutter, and sidewalk. All soft or dangerous trenches will be marked, barricaded and caution lighted for the protection of the public.

3. Property with an existing dwelling located on it or lots within a developed subdivision or planned development are considered improved property.

**B. Street Right-of-Way and Improved Property**

1. Backfill Material:

a. Backfill for manhole and pipe trench excavations through pavements in street or highway right-of-way or where the Purchaser orders, will be made with pit run gravel or other acceptable material as approved by the Purchaser. The backfill will be from the top of the pipe embedment material or manhole foundation to the subgrade elevation of the pavement. Pea gravel or similar granular material approximately uniform in size and without bonding properties will not be used.

2. Backfill for manhole and pipe trench excavations beyond pavements in street or highway right-of-way or outside public right-of-way will be made with select earth from the top level of the pipe embedment material or foundation to the subgrade elevation in paved area, or within 1 inch of the surface in areas to be sodded, or to the surface in all other areas.

3. Select material will be free from debris, organic matter, perishable compressible material and will contain no stones or lumps larger than 6 inches. Rocks and lumps smaller than 6 inches will not exceed an amount that will interfere with the consolidating properties of the fill material. Care will be taken that stones and lumps are kept separated and well distributed, and that all voids are completely filled with fine material. No rocks or lumps will come in direct contact with the pipe. The upper 3 feet of backfill in sodded or planted areas will be free of rocks or lumps larger than 1 inch in diameter.

4. Placement and Compaction:

a. Sanitary Sewer Trenches:

Backfill material will be placed by hand in 6 inch loose layers and tamped to a point 2 feet above the outside top of the pipe. Backfill will be compacted with suitable mechanical tamping equipment with special care being taken not to damage the pipe or joints. Use of compaction equipment directly above semi-rigid and flexible pipe should be avoided until sufficient backfill has been placed to ensure that the equipment will not damage the pipe. A minimum of 36 inches of compacted backfill above the top of semi-rigid and flexible pipe will be in place before wheel loading and a minimum of 48 inches of compacted backfill before use of pneumatic tampers. From these elevations to the subgrade elevation of the pavement, bottom of the sod, or to the original ground surface, suitable backfill will be mechanically placed in 9 inch, maximum, loose layers. All backfill material will be compacted to 95 percent of maximum density at plus or minus 2 percent of optimum moisture content as determined by Laboratory Standard Proctor Test (ASTM D 698).

b. Manholes and Special Structures:

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When the masonry or concrete work has set sufficiently to withstand compaction, and the Purchaser authorizes, backfill material will be placed in 6 inch loose layers and compacted with heavy tampers or pneumatic tampers to 95 percent of maximum density at plus or minus 2 percent of optimum moisture content as determined by Laboratory Standard Proctor Test (ASTM D 698). Suitable backfill will be placed in this manner from the foundation of the structure to the subgrade elevation of the pavement, the bottom of the sod or to the original ground surface.

C. Open Areas and Unimproved Property

1. Backfill Material:

Backfill of excavations on unimproved property will be made with select material from the top level of pipe embedment material or foundation to the surface. Non-granular select material to be used for backfill will be free from debris, organic matter and perishable compressible material, and will contain no stones or lumps or rock fragments larger than 6 inches. Rocks or lumps smaller than 6 inches in diameter will not exceed an amount that will interfere with the consolidating properties of the fill material. No rocks or lumps will come in direct contact with the pipe. Stones and lumps will be kept separated and well distributed, and all voids will be completely filled with fine material.

2. Placement of Backfill:

Backfill procedures specified in Specification Section 02530 Paragraph 3.11.B will apply from the trench bottom to a point 2 feet above the outside of the pipe. From this point to slightly above the surrounding surface elevation, suitable backfill may be placed by bulldozer or other mechanical means.

D. Sanitary Sewer Facilities Placed on Fill

1. All sanitary sewer pipe laid on fill will be ductile iron pipe. Fill material placed in areas over which sanitary sewer facilities will be constructed will be select, job-excavated earth from the original ground to the subgrade elevation of the facility.

2. The fill material will be placed in 6 inch loose layers and compacted to 95 percent of maximum density at plus or minus 2 percent of optimum moisture content as determined by Laboratory Standard Proctor Test (ASTM D 698) up to a point at least 2 feet above the outside top of the pipe or to the foundation of manholes or special structures. If compaction standards for the sanitary sewer exceed that of the adjoining fill, the width of compaction for a sanitary sewer will be not less than the outside diameter of pipe plus 10 feet. If compaction standards for the sanitary manhole or special structure exceed that of adjoining fill, the limits of compaction for the structure will be not less than 5 feet outside the structure base slab.

E. Removal of Excess Material

1. After the trench or excavation has been properly backfilled, all excess dirt will be removed from the streets, roadways and improved private property so pavements or turfed areas may be replaced and properties cleaned.

2. In open areas and unimproved property, the excess material may be used to fill low spots on property next to the right-of-way/easement. Before spreading excess soil, the Subcontractor will obtain written permission from the property owner for the spreading of excess soil, and a copy of the written permission will be submitted to the Purchaser. Such spreading or filling will not obstruct surface drainage and be to the satisfaction of the property owner. Excess material will be disposed of by the Subcontractor.

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3.12 TUNNELING, BORING, AND JACKING

A. General

1. Sewer pipe will be constructed by tunneling, boring, or jacking only at those locations shown on the plans or directed by the Purchaser. Carrier pipe for these applications will be of the type specified in the Plans and Specifications. Grade and alignment will be maintained through all liner pipes. The Subcontractor will submit shop drawings detailing the method, equipment and material to be used for tunneling, boring and jacking operations to the Purchaser for review and approval. The approval by the Purchaser of any drawings or plans will not in any way be deemed to release the Subcontractor from full responsibility for complete and accurate performance of the Work according to the Contract Drawings and Specifications.

2. When tunneling, boring, or jacking is required under railroads, highways, streets, or other facilities, construction will not interfere with the operation of the railroad, street, highway, or other facility and will not weaken or damage any embankment or structure. No water shall be introduced into any tunneling, boring or jacking excavation that lies within City, State or Rail Road right-of-way. A boring that uses a bentonite slurry may be allowed at the discretion of the Purchaser and the owner of the right-of-way.

3. The Subcontractor will be responsible for protection of utilities and sewers against damage by his work. If any utility above or near the tunnel is endangered or has been damaged because of the construction operations, the utility owner will be notified immediately and will be given access to the area to carry out all necessary repairs to such utilities. If any sewers are damaged, it will be the responsibility of the Subcontractor to make the necessary repairs. If any public or private property is endangered or has been damaged due to tunneling, boring, or jacking operations, it will be repaired at the Subcontractor's expense. All cost and expense to the Subcontractor of carrying out the above requirements will be considered included in his bid prices for the completed sewer installation.

4. Access pits will be of sufficient size to provide ample working space for the jacking or boring equipment, reaction blocks, bracing, liner plates, spoil removal, and 2 sections of pipe. Provisions will be made for the erection of guide rails in the bottom of the pit where applicable. If drainage is to be discharged from the jacking pit, a collection sump will be provided. Wherever end trenches are cut in the sides of the embankment or beyond it, such work will be sheeted securely and braced satisfactorily to prevent earth caving.

5. The Subcontractor will furnish and operate all necessary pumping equipment of ample capacity and arrange to keep tunnels and shafts free of water during construction and to dispose of water satisfactorily. During placement of concrete, drainage and pumping will be arranged so concrete is placed in dry conditions. No water will flow over the concrete until it has set and will not be damaged.

B. Tunneling

1. The Subcontractor will carry out the work of tunneling so there will be no cave-in or heaving of earth or other material into the tunnel excavation. If there should be any fall or movement of earth into the tunnel, the Subcontractor will proceed with the work with all necessary precautions to insure the safety of life and of sewers, utilities and public and private property above and near the tunnel.

2. The Subcontractor will furnish, place, and maintain all sheeting, bracing, lining or casing required to support the tunnel until the pipe and its pipe embedment, jointing, encasement, and backfilling have been completed. All liners will remain in place.

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3. Care will be used in trimming the surfaces of the excavated section and in placing the liners or sheeting and bracing so that the required minimum clearance between the outside of the pipe and the final position of the liners, sheeting and bracing in the tunnel will be attained without any deviation in sewer alignment. Sheeting or lining must be placed and held tightly against the trimmed earth surface of the excavated section so that there will be no voids between the earth and the lining or sheeting.
4. No part of the lining, bracing, or flanges of steel liner plates will project closer to the outside of the pipe or pipe bells than the clearance limits shown on the Plans, or a minimum of two inches, if not shown on the Plans.5. If timber is used for lining and bracing instead of steel liner plates, invert struts will be placed at the required intervals but in such manner that the pipe and its pipe embedment will be supported entirely by the original earth floor of the tunnel and not on timber lining or bracing. All timbers, when placed for the support of the roof and sides of the tunnel, will be properly fitted and wedged in place. Timber sets in tunnels will be abutting. All voids behind timbers will be filled with blocking or other suitable material.
6. Timbering will be designed and placed to allow the filling of voids. All excavated material not required for backfilling abandoned shafts will be removed from the site and disposed of by the Subcontractor at his expense.
7. Shafts will be constructed at the location shown on the Plans. Temporary construction shafts will be of adequate size and properly constructed and equipped to meet all safety requirements. All shafts will be barricaded, lighted, fenced, and properly guarded from the beginning of the excavation until the completion of the construction requiring the shaft.
8. Provision will be made at all shafts so that plumb lines suspended on the centerline of the sewer at each end of the shaft will hang freely from the surface.
9. A ladder meeting OSHA requirements will be provided in each shaft and will be kept in safe, good repair, clean and clear of debris.
10. Cavities between the surfaces of excavation and the tunnel liner plates or sheeting will be completely filled with a uniform sand cement grout consisting of 1 part portland cement and 7 parts sand and the minimum amount of water necessary for proper placement. Grout will be placed under pressure through grout holes in the steel liner plates or sheeting. The grout holes will be located and the grout placed in such sequence to insure the complete filling of all cavities and to transfer the load from the undisturbed material to the tunnel lining or sheeting uniformly.
11. After the tunnel section is excavated, lined, and braced, the pipe will be placed on and supported by steel rails or other approved supports. The supporting system will assure line and grade and will allow space below the pipe for concrete grout. Care will be used to avoid damage to the pipe and the liner plates.
12. The space between the pipe and the tunnel will be completely grouted with a mixture of sand and portland cement, mixed in the proportions of 1 part cement to 7 parts sand by volume and a minimum amount of water necessary for proper placement whether placed under pressure or by hand.
13. Temporary shafts will be completely abandoned. Unless otherwise specified in the Plans or Contract Documents all sheeting, bracing, and similar items may be removed unless the Subcontractor requests and receives authorization from the Purchaser to leave it in place. No payment will be made for items left in place at the Subcontractor's option. If the Plans or the Purchaser requires leaving the sheeting, bracing, and similar items in place, measurement will be made as provided in Specification Section 02530.5 and payment will be made as provided in

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C. Boring

1. When required by the Plans, sewers will be installed in bored holes. The holes will be bored from the downstream end, unless site conditions dictate otherwise and the Purchaser approves.
2. The boring machine to be used will be in good condition and capable of drilling the bore hole within the required limits of accuracy. A smooth liner of sufficient strength will be forced into the bored hole to give a tight fit against the earth sides of the bore hole and still provide a uniform clearance of at least two inches around the pipe flange to permit pressure grouting. The liner pipe will be carefully inspected to insure that the carrier pipe can be properly placed.
3. All carrier pipe shall be mechanical joint or restrained joint pipe. Manholes at the ends of a section of bored pipe will not be constructed until the bored section is completed.
4. The following procedures will be used for carrier pipe 18 inches and larger in diameter. The assembled pipe will be placed in the bored hole with approved, non-metallic, casing spacers attached. Casing spacers will be attached in accordance with the manufacturer's recommendations and with a casing spacer installed within 6 inches of each end of the bore. The assembled pipe will be placed in the bored hole only by such method that will keep the joints in compression. Any method that disjoints the pipe while being placed will not be permitted.
5. The ends of the bore shall be sealed with an approved, flexible end seal. The end seals shall be attached in accordance with the manufacturer's recommendations using stainless steel hardware.
6. When unforeseen obstructions or conditions require abandonment of a partially completed bore hole, and the starting of a new hole, the Subcontractor will grout the abandoned bore hole solid. The Subcontractor will receive no compensation for any expenses incurred by any unsuccessful attempt.

D. Jacking

1. The Subcontractor will furnish for the Purchaser's review, a plan showing his proposed method of jacking, including the design for the jacking head, jacking support or back stop, arrangement and position of jacks, pipe guides, and similar items in the assembled position. The review of this plan by the Purchaser will not relieve the Subcontractor from his responsibility to obtain the specified results.
2. Heavy duty jacks suitable for forcing the pipe through the embankment will be provided by the Subcontractor. In operating jacks even pressure will be applied to all jacks used. A suitable jacking head and bracing between jacks and jacking head will be provided so that pressure will be applied to the pipe uniformly around the circumference of the pipe. A suitable jacking frame or backstop capable of resisting the jacking forces will be provided. The pipe to be jacked will be set on guides, properly braced together to support the section of the pipe and to direct it in the proper line and grade. The whole jacking assembly will be placed to line up with the direction and grade of the pipe. The Subcontractor may use a cutting edge of steel plate around the head end of the pipe extending a short distance beyond the end of the pipe with the inside angles or lugs to keep the cutting edge from slipping back onto pipe.
3. The pipe will be jacked from the downstream end. Manholes at the ends of a section of jacked pipe will not be constructed until jacked section is completed.
4. Any pipe damaged in jacking operations will be removed and replaced by the Subcontractor

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at his own expense. Embankment material will be excavated just ahead of the pipe and material removed through the pipe, and the pipe forced through the embankment with jacks, into the space thus provided.

5. The excavation for the underside of the pipe, for at least one-third of the circumference of the pipe, will conform to the contour and grade of the pipe. A clearance of not more than 2 inches may be provided for the upper half of the pipe. This clearance is to be tapered off to zero at the point where the excavation conforms to the contour of the pipe.

6. The distance that the excavation will extend beyond the end of the pipe depends on the character of the material, but it will not exceed 2 feet in any case. This distance will be decreased if the character of the material being excavated makes it desirable to keep the advance excavation closer to the end of the pipe.

7. A cushion material will be placed in the joints between each pipe section adequate to distribute the jacking forces around the entire periphery of the pipe uniformly.

8. When jacking of pipe is begun, the operation will be carried on without interruption, as much as practicable, to prevent the pipe from becoming firmly set in the embankment.

9. The pits or trenches excavated to allow jacking operations will be backfilled immediately after the jacking of the pipe has been completed according to Specification Section 02530 Paragraph 3.11.

#### E. Sewer Pipe in Jacked Liner

1. When required by the Plans or Contract Documents, a sewer pipe will be installed by jacking a pipe as a liner and inserting a carrier pipe of required size, type, and class. When using jacking for liners, the steel liner will be welded steel, 35,000 psi yield strength, and of the diameter and wall thickness required on the Plans and Specifications. The Subcontractor will provide, at his own expense, thicker walled lines if necessary to withstand the forces of jacking. In any case, the Subcontractor will retain full responsibility for the adequacy of this jacking operation, equipment and material.

#### F. Reserved.

#### 3.13 DELETED

#### 3.14 FINAL GRADING

A. Final grading around sanitary sewer facilities will conform to the elevation of adjacent undisturbed ground or as shown on the Plans. Sufficient grading will be done to provide adequate drainage.

#### 3.15 CLEANING

A. All necessary precautions will be taken to prevent the entrance of mud, sand, or other obstructing material into the pipelines. As the work progresses, the interior of the sewer will be cleaned of all dirt, jointing material and extraneous material. On small pipe where cleaning after laying may be difficult, a squeegee will be kept in the pipeline and pulled forward past each joint immediately after its completion. Before final inspection the Subcontractor will remove all debris and foreign material.

### PART 4 - FINAL TESTING AND ACCEPTANCE

#### 4.01 VISUAL INSPECTION

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A. All work will be subject to visual inspection for faults or defects and any such deviation or omission will be corrected at once. All tests will be made by the Subcontractor who will provide necessary equipment for testing and lamping the system in the presence of and under the supervision and instructions of the Purchaser. Lamp tests will be observed first hand by the Purchaser. Each section of sewer line will show a full circle of light when lamped between manholes. All defects located will be corrected before conducting leakage tests.

#### 4.02 LEAKAGE TESTS

A. Leakage tests will be performed on the full length of all sewer lines and manholes in the presence of the Purchaser before acceptance. The cost of all testing will be included in the unit price for the item being tested.

#### B. Exfiltration Leakage Test

1. This section will only apply to pipe larger than 24 inches and smaller than 48 inches in diameter. All pipe over 48 inches in diameter will have individual joint testing according to Specification Section 02530 Paragraph 4.02.E. The method of testing used by the Subcontractor will be subject to approval by the Purchaser. The Subcontractor will provide all required testing apparatus. The method adopted must exert a minimum internal water pressure of four feet. This hydrostatic head will be measured from the inside top of the pipe at the high end of the section being tested. The height of the water level at the beginning of the test must be high enough so that the 4-foot head will be standing at the end of the test. The maximum hydrostatic head is limited to 15 feet. The exfiltration test will be maintained for at least two hours on each reach between manholes as necessary to find all leaks. The trench and backfill are intended to be free of excess water.

2. In areas where groundwater is known to exist, a one-half inch diameter capped pipe nipple approximately 10 inches long will be installed through the manhole wall on top of the lowest sewer line entering the manhole. This will be done at the time the sewer line is installed. Immediately before the performance of the leakage test, the groundwater level will be determined by removing pipe cap, blowing air through pipe nipples into the ground to clear it, and then connecting a clear plastic tube to the nipple. The tube will be held vertically and a measurement of height in feet of water will be taken after the water stops rising in this plastic tube. The height in feet will be divided by 2.3 to establish the pounds of pressure that will be added to all readings. In the event there is water present in the trench or backfill at the time of the test, the required head producing the pressure inside the pipe must be raised to offset the counteracting pressure outside of the pipe. The test will not be considered satisfactory until an acceptable method of measurement shows that the exfiltration rate does not exceed 0 gallons per inch of internal diameter per mile of pipe per day for each reach tested.

3. An initial test must be arranged by the Subcontractor so that the first reach of each size laid by each crew at the beginning of the work day can be tested before the backfill has been completed, but the pipe will be backfilled to a point 2 feet above the outside top of the pipe. This test reach is intended to extend only to the next proposed manhole location. However, if conditions justify, the length of the test reach may be reduced but never will this reach be less than 100 feet. No further pipe laying will be permitted by this crew until the above described test has been satisfied. All remaining pipe will be subject to the exfiltration test after manholes have been constructed and backfill placed. Manholes are to be included in this test and will be considered as sections of pipe equal to the diameter of the manhole.

4. If anytime the exfiltration observed and measured by the Purchaser exceeds 0 gallons per inch of internal diameter per mile of sewer per day, the Subcontractor will find the point(s) of leakage and will make necessary repairs and then retest the same reach. The Subcontractor will submit his plans for repair to the Purchaser for his review.

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5. Water used for testing will be removed from the test reach following acceptance and will be disposed of properly. Water used for testing will not be discharged in such a manner to damage other construction or public or private property. The cost of providing the test water will be borne by the Subcontractor.

C. Air Leakage Test for 6-24 inch Diameter Pipe

1. Upon completion of construction, or earlier if the Purchaser deems advisable, the Subcontractor will provide the necessary equipment and labor to perform low pressure air tests according to ASTM F1417. This test will be performed in the presence of the Purchaser and will be for all types of gravity sewer pipe. This test will also include service lines from manholes.

2. The pressure test gauge will meet the following minimum specifications:

Size (diameter)	4 ½ inches
Pressure Range	0-15 PSI
Figure Intervals	1 PSI Increments
Minor Subdivisions	0.05 PSI
Pressure Tube	Bourdon Tube or diaphragm
Accuracy	Plus or minus 0.25% of Maximum scale reading
Dial	White coated aluminum with black lettering, 270° arc and mirror edges
Pipe Connection	Low male ½ inch NPT

3. Calibration data will be supplied with all pressure test gauges. Certification of pressure test gauges will be required from the gauge manufacturer. This certification and calibration data will be available to the Purchaser whenever air tests are done.

4. Air leakage tests will be performed on each reach of sewer pipe between manholes after completion of the installation of pipe and appurtenances and the backfill of sewer trenches. The test time will be determined from the following table. If air tests fail to meet the following requirements, repeat tests as necessary after all leaks and defects have been repaired. Before acceptance, the same sewer reach will pass the low pressure air test.

**Time Required for a 1.0 psig Pressure Drop for Size and Length of Pipe Indicated <sup>1</sup>**

Pipe Diameter (in.)	Minimum Time (min:sec)	Test Time for Length of Sewer Tested (min)
6	5:40	.854 X L(ft)/60
8	7:34	1.52 X L(ft)/60
10	9:26	2.374 X L(ft)/60
12	11:20	3.418 X L(ft)/60
15	14:10	5.342 X L(ft)/60
18	17:00	7.692 X L(ft)/60
21	19:50	10.47 X L(ft)/60
24	22:40	13.674 X L(ft)/60



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1. Establish the test time for the sewer length from the formula or the minimum time, whichever is greater.

D. Infiltration Test

1. Infiltration tests may be required for the complete line or any portion of it. Failure of any part of the line to pass an infiltration test will be sufficient reason to require additional work by the Subcontractor to reduce the infiltration in such portions of the line tested. The passing of an infiltration test will in no way relieve the Subcontractor of any responsibility to repair visible leaks found during the visual inspection.

2. Maximum allowable infiltration will be 0 gallons per mile per inch of diameter of sewer per 24-hour day at a time. The joints will be tight, and visible leakage in the joints of leakage greater than that specified above will be repaired at the Subcontractor's expense by any means necessary.

E. Joint Acceptance Testing

1. Individual joints will be tested for pipe diameters of 48 inches and greater. Testing will be performed according to ASTM C 1103.

4.03 DEFLECTION TEST - SEMIRIGID AND FLEXIBLE PIPE

A. All polyvinyl chloride (PVC) pipe and glass fiber reinforced polymer mortar pipe will be tested for deflection. All testing will take place after backfill has been in place at least 30 days. All lines will be thoroughly cleaned before testing to assure accuracy.

B. Tests will be run using a rigid ball or nine arm mandrel having a diameter of 95% of the inside diameter of the pipe for PVC and 96% of the inside diameter of the pipe for glass fiber reinforced polymer mortar pipe. The mandrel will be pulled freely by hand through the pipe from manhole to manhole. No pipe deflection will exceed 5% for PVC and 4% for glass fiber reinforced polymer mortar pipe. Any section failing the test will be repaired by re-bedding or pipe replacement and retested to the satisfaction of the Purchaser.

C. The cost of this service will be included in the unit price bid for the pipe.

4.04 SEWAGE FORCE MAINS

A. The Subcontractor will perform hydrostatic pressure and leakage tests concurrently conforming to AWWA C 600, AWWA C 605, or ASTM D 2774 procedures as applicable and as modified herein. Tests will apply to all sewage force mains after backfilling.

B. Force mains will be tested separately in segments between sectionalizing valves, between a sectionalizing valve and a test plug, or between test plugs. Select test segments such that adjustable seated valves are isolated for individual checking. The Subcontractor will furnish and install test plugs at no additional cost, including all anchors, braces and other devices to withstand hydrostatic pressure on plugs. The Subcontractor will be responsible for any damage to public or private property caused by failure of plugs. Limit water fill rates of line to available venting capacity.

C. Hydrostatic Pressure Test

Conduct tests at 1.5 times maximum operating pressure determined by following

$$P_{pt} = 0.650 (OP-GE), \text{ in which}$$

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- P<sub>pt</sub> = test pressure in psi at gauge elevation
- OP = operating pressure in feet as indicated for highest elevation of the hydraulic gradient on each section of the line
- GE = elevation in feet at center line of gauge

**D. Hydrostatic Leakage Test**

Conduct tests conforming to AWWA C 600, AWWA C 605, or ASTM D 2774 procedures, as applicable, at maximum operating pressure determined by following formula:

$$P_{it} = 0.433 (OP-GE), \text{ in which}$$

- P<sub>it</sub> = test pressure in psi at gauge elevation
- OP = operating pressure in feet as indicated for highest elevation of the hydraulic gradient on each section of the line
- GE = elevation in feet at center line of gauge

E. Satisfactorily complete previously defined pressure tests before determining the amount of leakage. Maximum allowable leakage will be determined by the following formula:

$$L = ND \frac{\sqrt{P}}{7400}$$

- L = Allowable leakage in gallons/hour
- N = Number of joints in length of pipeline tested
- D = Nominal diameter of the pipe, in inches
- P = Average test pressure during leakage test, in pounds per square inch, gauge

**4.05 FINAL ACCEPTANCE**

A. When all work required by the Contract has been completed, the Subcontractor shall submit to the Purchaser written certification from a registered land surveyor that the centerline of each structure is within 2.0 feet of the centerline of the sewer easement or the location designated on the plans. After receiving the surveyor's certification from the Subcontractor, the Purchaser will make a final inspection of the Work, including any tests for operation. After completion of this inspection the Purchaser will, if all things are satisfactory to him, issue to the Subcontractor a Certificate of Completion certifying that the Work required by the Contract has been completed according to the Contract Drawings and Specifications. However, the Certificate will not operate to release the Subcontractor or his sureties from any guarantees under the Contract or the Performance Bond. Upon receipt of the Certificate of Completion the Subcontractor will clean the premises and see that they are in an orderly condition.

**PART 5 - MEASUREMENT**

**5.01 SITE PREPARATION AND RESTORATION**

A. The area to be considered for measurement will be the limit of the construction area unless otherwise directed by the Purchaser.

B. When the Proposal Sheet(s) do(es) not contain an item for Site Preparation and Restoration, this work will be required within the construction limits and will not be paid for directly but will be considered as a subsidiary obligation of the Subcontractor under other contract items.

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5.02 UNDERCUT BACKFILL

A. Undercut backfill will be measured by the ton of limestone in place.

5.03 TRAFFIC CONTROL

A. Traffic control will be paid per each sewer pipe installation.

5.04 PAVEMENT BACKFILL

A. Pit run gravel or other acceptable material used for backfill under pavements or other areas directed by the Purchaser will be measured by the cubic yard in the following manner. Cubic yards of Pavement Backfill equals the linear feet of sewer pipe installed directly below pavement as measured along the centerline of the pipe multiplied by the trench payline width in feet multiplied by the depth of pavement backfill material in feet divided by 27. The trench payline width is defined as the outside diameter of the sewer pipe plus 2 feet. The depth of pavement backfill is defined as the distance from 6 inches above the top of the sewer pipe to the subgrade elevation of the pavement.

5.05 SERVICE CONNECTION REMOVAL AND REPLACEMENT

A. Service connection removal and replacement for construction of sewer facilities will be measured per each, complete in place. Service Connections damaged by the Subcontractor that do not require removal and replacement for construction of sewer facilities will not be measured for payment.

5.06 EXCAVATION

A. All work for excavation, blasting, drainage of trenches and dewatering, backfilling of excavation, compaction, grading, protection of existing utilities, disposal of excess material, and all other similar items included in this section of the Specifications but not covered by a Pay Item herein will be considered obligations of the Subcontractor under other Pay Items of the Contract.

5.07 SEWER PIPE

A. Sewer pipe length will be measured per linear foot along the centerline of the pipe from center of manhole to center of manhole. When there are special structures, sewer pipe will be measured from inside face to inside face for the various sizes, types, classes or wall thicknesses. No measurement of pipe depth will be made unless changed field conditions result in a change in the Plans by the Purchaser.

B. Sewer pipe length measurement will include the length of wyes as measured along the primary axis for all sizes of sewer pipe.

5.08 PIPE WYES

A. Pipe wyes on sewer lines will not be measured for payment, but are incidental to the cost of furnishing and installing sewer pipe.

5.09 SEWAGE FORCE MAIN

A. Sewage force main length will be measured per linear foot along the centerline of the pipe from the point of measurement at the pumping station or valve box shown on the Plans to the end of the force main at its discharge location. Shut-off and relief valves, valve boxes, and thrust blocks are incidental to the construction of the force main and/or pump station and will not be measured for payment.

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5.10 DUCTILE IRON PIPE FITTINGS

A. Ductile iron pipe fittings will not be measured for payment, but are incidental to the cost of furnishing and installing ductile iron sewer pipe or inverted siphons.

5.11 SERVICE CONNECTIONS

A. Building connections between sewer main and right-of-way or easement line will be measured per linear foot to the nearest whole foot, along the centerline of the pipe from the outside face of the wye to the end of the reducer, for the various sizes and types constructed.

B. Building connections between a manhole and the right-of-way or easement line will be measured per linear foot horizontally from the inside face of the manhole to the end of the reducer. Drop service connections will be measured per vertical foot from the flow line of the service connection in the manhole wall to the end of the building connection inside the manhole to the nearest whole foot, along the centerline of the pipe for the various sizes constructed. No measurement of building connection depth will be made. Building connection length will include the length of fitting, reducers, and specials as measured along their centerline.

5.12 Reserved.

5.13 PLAIN CONCRETE FOR GENERAL USE

A. Concrete for general use including but not limited to pipe bedding, encasement and collars at the locations shown on the Plans or directed by the Purchaser will be measured per cubic yard, complete in place for each class used.

5.14 REINFORCED CONCRETE

A. Reinforced concrete including but not limited to pipe encasement and collars at the locations shown on the Plans or directed by the Purchaser will be measured per cubic yard, complete in place.

5.15 INVERTED SIPHON

A. Inverted siphons constructed according to Plans and Specifications will be measured per lump sum, for each siphon complete in place.

5.16 SEWER IN EARTH TUNNEL

A. Sewers constructed in earth tunnels will be measured by the centerline length for tunnels with liner plate or without liner plate.

B. Measurements will be from the face of the pit to the face of the pit.

5.17 SEWER IN BORED HOLE

A. Sewers constructed in a bored hole will be measured by the centerline length for bored holes with or without liner pipe.

B. If Subcontractor has requested and has obtained approval to use a bored hole instead of the construction required by the Plans, no measurement of sewers in bored holes will be made.

C. Reserved.

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5.18 JACKED SEWER

A. Jacked sewers will be measured by the centerline length from the face of the pit to the face of the pit. If the Subcontractor has requested and has obtained approval to jack a sewer instead of the construction required by the Plans, no measurement of jacked sewers will be made.

5.19 SEWER IN JACKED LINER

A. Sewers in jacked liner will be measured by the centerline length from the face of the pit to the face of the pit. If the Subcontractor has requested and has obtained approval to construct a sewer in a jacked liner instead of the construction required by the Plans, no measurement of sewers in jacked liner will be made.

5.20 DELETED

5.21 ABANDONMENT OF EXISTING PIPE

A. Abandonment of existing pipe will be considered as a subsidiary obligation of the Subcontractor under other Pay Items of the Contract.

5.22 REMOVAL OF EXISTING PIPE

A. Removal of existing pipe will be measured per linear foot, to the nearest whole foot, along the centerline of the pipe to be removed regardless of size, type, or depth. No measurement of existing pipe removal within the limits of excavation for new sewers will be made.

**PART 6 - PAYMENT**

6.01 SITE PREPARATION AND RESTORATION

A. Payment will be made for Site Preparation and Restoration at the contract lump sum price, which will be full compensation for removal of trees, shrubs, plants, brush, rubbish, fences, manmade obstructions including but not limited to structures, abandoned cars and appliances, building foundations, and all other obstructions as may be directed by the Purchaser; the disposal of debris, removing of obstructions, and the restoration of fences, turfed areas, and all other items will be as specified in the Plans and Contract Documents or as directed by the Purchaser.

6.02 UNDERCUT BACKFILL

A. Accepted quantities of undercut backfill will be paid for at the contract unit price per ton of limestone furnished and placed, which will be full compensation for undercut excavation, special protection, protection of existing utilities, and backfilling to bottom of facility subgrade elevations, complete in place.

6.03 TRAFFIC CONTROL Traffic Control will be paid per each sewer pipe installation including all appurtenances required to comply with MUTCD Standards. .

6.04 PAVEMENT BACKFILL

A. Accepted quantities of pit run gravel or other acceptable material used for backfill under pavements or other areas designated by the Purchaser will be paid for at the contract unit price per ton furnished and placed, which will be full compensation for furnishing, placing and compacting the selected material.

6.05 BUILDING (HOUSE) CONNECTION REMOVAL AND REPLACEMENT

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A. Accepted quantities of building connections removed and replaced will be paid for at the contract unit price per each for various types of building connections, which will be full compensation for excavation, removal of old service line and appurtenances, furnishing and construction of new service lines, connections to existing service line and appurtenances to remain, and backfilling, complete in place.

B. All pipeline material will be generically the same throughout the project except solid wall PVC pipe service connected to truss pipe mainlines.

6.06 OMITTED

6.07 SEWER PIPE

A. The accepted quantities of all sewer pipe will be paid for at the contract unit price per linear foot furnished and laid for the various sizes, types, classes, or wall thicknesses of pipe, which will be full compensation for material and material testing, excavation, special protection, protection of existing utilities, maintenance of sewage flow, pipe embedment, laying, jointing, cleaning and inspection, conducting acceptance tests, installation of pipe wyes, connection to manholes, adapters and couplings, stoppers, and removal and/or abandonment of existing pipe within the limits of excavation and backfilling outside pavement areas. All pipeline material will be generically the same throughout the project except connecting solid wall PVC pipe service connections to truss pipe mainlines.

6.08 OMITTED

6.09 SEWAGE FORCE MAIN

A. The accepted quantities of sewage force main will be paid for at the contract unit price per linear foot furnished and laid for the various sizes, types and classes or wall thicknesses, which will be full compensation for material and material testing, excavation, special protection, protection of existing utilities, pipe embedment, laying, jointing, fittings, shut-off valves, relief valves, valve pits, thrust blocks, cleaning and inspection, conducting acceptance tests, connection to existing sewer manholes or structures, removal and/or abandonment of existing pipe within the limits of excavation and backfilling outside pavement areas.

6.10 OMITTED

6.11 SERVICE CONNECTIONS

A. The accepted quantities of building connections will be paid for at the contract unit price per linear foot furnished and laid for the various sizes and types. The accepted quantities of drop service connection will be paid for at the contract unit price per vertical foot furnished and installed. The contract unit price will be full compensation for material and material testing, excavation, special protection, protection of existing utilities, pipe embedment, laying, jointing, adapters and couplings, stoppers, reducers, marking reducer, removal and/or abandonment of existing pipe within the limits of excavation and backfilling outside of pavement areas.

6.12 Reserved.

6.13 PLAIN CONCRETE FOR GENERAL USE

A. The accepted quantities of plain concrete for general use including but not limited to pipe bedding, encasement and collars will be paid for at the contract unit price per cubic yard complete in place, which will be full compensation for material, testing, excavation, pipe support, form work, removal of forms, and curing and protection of concrete.

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6.14 REINFORCED CONCRETE

A. The accepted quantities of reinforced concrete including but not limited to pipe encasement and collars will be paid for at the contract unit price per cubic yard, complete in place that will be full compensation for material, testing, excavation, pipe support, form work, reinforcing steel, removal of forms, and curing and protection of concrete.

6.15 INVERTED SIPHON

A. Payment will be made for Inverted Siphon at the contract lump sum price, which price will be full compensation for material and material testing, excavation, special protection, cofferdams, temporary bulkheads, maintenance of sewage flow during construction, protection of existing utilities, inlet manhole and outlet manhole with rims and covers, intermediate manholes, siphon pipe and fittings, concrete encasement, conducting acceptance test, removal and/or abandonment of existing pipe within the limits of excavation and backfilling.

6.16 SEWER IN EARTH TUNNEL

A. The accepted quantities of sewers in earth tunnels will be paid for at the contract unit price per linear foot furnished and constructed for the various sizes, which price will be full compensation for material and material testing, pit excavation, sheeting, timber bracing, liner if required, excavation, temporary shafts, pumping, protection of existing utilities, maintenance of sewage flow, pipe, laying pipe, making pipe joints, grouting, cleaning and inspection, conducting acceptance tests and backfilling of pits and shafts.

6.17 SEWER IN BORED HOLE

A. The accepted quantities of sewers in a bored hole will be paid for at the contract unit price per linear foot furnished and constructed for the various sizes, which will be full compensation for material and material testing, pit excavation, sheeting, timber bracing, liner if required, excavation, boring temporary shafts, pumping, protection of existing utilities, maintenance of sewage flow, pipe, casing spacers, laying pipe, making pipe joints, grouting, cleaning and inspection, conducting acceptance test, and backfilling of pits and shafts.

B. Reserved.

6.18 JACKED SEWER

A. The accepted quantities of jacked sewers will be paid for at the contract unit price per linear foot furnished and constructed for the various sizes; the price will be full compensation for material and material testing, pit excavation, jacking equipment and concrete slab foundation, jacking back stop, temporary shafts, pumping, protection of existing utilities, maintenance of sewage flow, pipe, jacking pipe, making pipe joint cushions, cleaning and inspection, conducting acceptance tests, and backfilling of pits and shafts.

6.19 SEWER IN JACKED LINER

A. The accepted quantities of sewers in jacked liner will be paid for at the contract unit price per linear foot furnished and constructed for the various sizes; the price will be full compensation for material and material testing, pit excavation, jacking equipment and concrete slab foundation, jacking back stop, temporary shafts, pumping, protection of existing utilities, maintenance of sewage flow, pipe liner, laying pipe, making pipe joints, grouting, cleaning and inspection, conducting acceptance tests, and backfilling of pits and shafts.

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6.20 DELETED

6.21 OMITTED

6.22 REMOVAL OF EXISTING PIPE

A. The accepted quantities of existing pipe removal will be paid for at the contract unit price per linear foot regardless of pipe size or type which price will be full compensation for excavation, special protection, protection of existing utilities, pipe removal, salvage or disposal, backfilling and site restoration.

6.23 PAYMENT WILL BE MADE UNDER:

Item No.	Pay Item	Pay Unit
02530-6.01	SITE PREPARATION AND RESTORATION	Lump Sum
02530-6.02	UNDERCUT BACKFILL	Ton
02530-6.04	PAVEMENT BACKFILL	Ton
02530-6.07.06.12.01	12" Ductile Iron Pipe, Class 50, 0'-6' Depth	LF
02530-6.07.06.12.02	12" Ductile Iron Pipe, Class 50, 6.1'-10' Depth	LF
02530-6.07.06.12.03	12" Ductile Iron Pipe, Class 50, 10.1'-14' Depth	LF
02530-6.07.06.12.04	12" Ductile Iron Pipe, Class 50, 14.1'-18' Depth	LF
02530-6.07.06.12.05	12" Ductile Iron Pipe, Class 50, 18.1'-22' Depth	LF
02530-6.07.06.12.06	12" Ductile Iron Pipe, Class 50, 22.1'-26' Depth	LF
02530-6.07.15.12.01	12" Polyvinyl Chloride (PVC) Pipe, 0'-6' Depth	LF
02530-6.07.15.12.02	12" Polyvinyl Chloride (PVC) Pipe, 6.1'-10' Depth	LF
02530-6.07.15.12.03	12" Polyvinyl Chloride (PVC) Pipe, 10.1'-14' Depth	LF
02530-6.07.15.12.04	12" Polyvinyl Chloride (PVC) Pipe, 14.1'-18' Depth	LF
02530-6.07.15.12.05	12" Polyvinyl Chloride (PVC) Pipe, 18.1'-22' Depth	LF
02530-6.07.15.12.06	12" Polyvinyl Chloride (PVC) Pipe, 22.1'-26' Depth	LF
02530-6.07.16.24.01	24" Glass Fiber Reinforced Polymer Mortar Pipe, 0'-6' Depth	LF
02530-6.07.16.24.02	24" Glass Fiber Reinforced Polymer Mortar Pipe, 6.1'-10' Depth	LF
02530-6.07.16.24.03	24" Glass Fiber Reinforced Polymer Mortar Pipe, 10.1'-14' Depth	LF
02530-6.07.16.24.04	24" Glass Fiber Reinforced Polymer Mortar Pipe, 14.1'-18' Depth	LF
02530-6.07.16.24.05	24" Glass Fiber Reinforced Polymer Mortar Pipe, 18.1'-22' Depth	LF
02530-6.07.16.24.06	24" Glass Fiber Reinforced Polymer Mortar Pipe, 22.1'-26' Depth	LF

**Examples of Pay Item Numbering System for Sewer Pipes**

02530-6.07.03.48	Pay Item Number
02530-6	Section of Specification
.07	Last digit(s) of applicable paragraphs for payment
.03	Type of Pipe: e.g., Reinforced Concrete, Class III
.48	Size of Pipe; e.g., 48" diameter

**END OF SECTION 02530**



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SECTION 02531 – INSTALLATION AND REPLACEMENT OF MANHOLES

**PART 1 – SCOPE**

- 1.01 This Work consists of the replacement of existing or installation of new manholes for sanitary sewers as shown on the Drawings, stipulated in the Contract Documents, or as directed by the Purchaser. The construction will be accomplished by these Specifications and in conformity with the details shown on the Drawings or established by the Purchaser.
- 1.02 Accurately field measure and size each individual manhole. Each existing sewer manhole designated to be replaced may have a different configuration and varying field dimensions.
- 1.03 Where existing manholes are being replaced, the Subcontractor will arrange the work such that sewage flow will be maintained during the construction period with no discharge of sewage into an open trench, provide necessary bypass pumping capacity to carry flow downstream of the manhole to be replaced.
- 1.04 All new manholes shall be precast concrete. The top section of the manholes shall be either flat top or eccentric cones as shown on Drawings.
- 1.05 Cast iron frames shall be set at the required elevation and properly bonded to the flat top, eccentric cone, or grade rings with two rings of butyl mastic sealant and anchor bolts.

**PART 2 - MATERIALS AND EQUIPMENT**

2.01 MATERIALS

- A. Unless otherwise specified all sample submittals shall be delivered to the Program Manager within two weeks of the NTP.
- B. Site Contractor emergency phone numbers.
- C. Schedules of work on a weekly basis that will be delivered no later than 2:00 PM on Thursday for the week following with daily AM email updates of approximate crew locations each day.
  1. Weekly schedule format shall contain the following elements:
    - a. Map format.
    - b. Sufficient streets labeled and identified at a scale to provide clarity.
    - c. Nature and type of crew location by map area.
- D. Confined space entry Drawings.
- E. Shop Drawings:
  1. Precast Manholes: Details of construction.
  2. Precast Base, Cones, and Top Slab Sections: Details of construction.
  3. Manholes Over Existing Piping: Drawings and schedule for diverting flow.
    - a. Certificate from manufacturer of castings indicating they meet applicable requirements of these Specifications.
    - b. Precast Manhole Sections: Manufacturer's results of tests performed on representative sections to be furnished.
    - c. Certified load test data for precast manhole steps.
    - d. Plan for diversion of flow during installation of manhole over existing piping

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F. Vent Stack

1. Vent stack pipe will be a 4-inch diameter galvanized steel pipe conforming to the requirements of ASTM A 53 with a minimum wall thickness of standard weight pipe. One end of the vent stack pipe will have a 180-degree bend fabricated by either shop welding a manufactured 180 degree elbow or fitting the pipe with a manufactured 180 degree threaded elbow and coupling. The opposite end of the pipe will be plain end. The maximum height for vent stacks for this specification shall be 20 vertical feet.
2. Vent stack supports will be fabricated from steel shapes conforming to ASTM A 36, and to the dimensions and details shown on the Plans. The vent stack supports will be welded to the vent stack pipe and to the vent stack support bottom ring around the entire contact surface.
3. The vent stack support bottom ring will be shop fabricated with bolt holes at the spacing shown on the plans for anchorage to the manhole top. All welding will be according to the American Welding Society Structural Welding Code.
4. A vent stack support ring with threaded coupling may be cast in the flat top for installation of the vent stack.

2.03. CONSTRUCTION MATERIAL

- A. All material furnished by the Subcontractor will be new, high quality and free from defects. Previously used material in acceptable condition is allowed for bracing, forms, false work, and similar uses. Material not conforming to the requirements of the Specifications will be considered defective and will be removed immediately from the site.

2.04. QUALIFICATION OF MANUFACTURER

- A. Manhole for sanitary sewers will be the standard product of an established, reputable manufacturer made in a permanent plant. Suppliers for each material to be used by the Contractor are subject to the approval of the Purchaser. No material will be delivered until the manufacturer and product have been approved by the Purchaser.

2.05. MORTAR

- A. Mortar shall be composed of one part Portland cement and two parts sand (volumetric measure) thoroughly mixed in a tight box, with water added gradually and mixed continually until mortar has attained the proper consistency for use in brick masonry; prepared only in such quantities as needed for immediate use; mortar mixed for more than 30 minutes, retempered, or previously set will not be allowed.

2.06. CAST IRON CASTINGS

- A. Castings shall be cast iron conforming to the Standard Drawings and the requirements of Class 30 ASTM A48; made accurately to the required dimensions; sound, smooth, clean, and free from blisters and other defects; not plugged or otherwise treated to remedy defects; machined so that covers rest securely in the frames with no rocking, and such that they are in contact with frame flanges for the entire perimeter of the contact surfaces.

2.07. MANHOLE STEPS

- A. Manhole steps are not allowed in sewer structures.

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<b>Composition</b>	<b>Test Method</b>	<b>Minimum</b>	<b>Maximum</b>
Bitumen (Petroleum Plastic Content)	ASTM D4	50	70
Ash Inert Mineral Matter	AASHTO T11	30	50
Volatile Matter	ASTM D6	---	2.0
<b>Property</b>	<b>Test Method</b>	<b>Minimum</b>	<b>Maximum</b>
Specific Gravity at 77 degrees F	ASTM D71	1.2	1.3
Ductility at 77 degrees F(cm)	ASTM D113	5.0	---
Softening Point	ASTM D36	320 degrees F	---
Penetration 77 degrees F (150 gms) 5 sec.	ASTM D217	50	120

2.08. BUTYL MASTIC SEALANT

- A. The sealant shall be used when joining the casting frame to the precast manhole to provide a watertight structure. The sealing compound shall be produced from blends of refined hydrocarbon resins and plasticizing compounds reinforced with inert mineral filler, and shall contain no solvents, irritating fumes, or obnoxious odors. The compound shall not depend on oxidizing, evaporating, or chemical action for its adhesive or cohesive strength. It shall be supplied in extruded rope form of suitable cross section and in such sizes as to seal the joint space. Use two complete ropes at each joint. The sealing compound shall be protected by a suitable removable two-piece wrapper, which shall be designed so that half may be removed longitudinally without disturbing the other half in order to facilitate application of the sealing compound. The sealant shall also meet the requirements of the following table:

2.09. PRECAST MANHOLES

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- A. All components shall meet the requirements of the Standard Drawings, ASTM C478, and ASTM C76 Class III. The mix design shall be:

Type I Portland Cement Content	615 Pounds per Cubic Yard
Fly Ash Content	85 Pounds per Cubic Yard
Coarse Aggregate Content	1,600 Pounds per Cubic Yard
Fine Aggregate Content	1,250 Pounds per Cubic Yard
Maximum Water/Cement Ration	0.40
Superplasticizer shall be added to create a workable slump.	

- B. All cone sections and transition sections shall be eccentric. Barrel sections will be custom made with openings to meet indicated pipe alignment and invert elevations.
- C. The circumferential reinforcement for the manhole sections shall consist of welded wire fabric per ASTM C478
- D. Manholes shall be constructed with the minimum number of sections possible that the precaster can provide, to minimize the number of joints in the manhole. Minimum manhole section shall be 16 inches deep.
- E. Lifting holes through the manhole structure shall not be permitted.
- F. Each joint shall be a tongue and groove with two layers of butyl mastic sealant.
- G. Pipe Connections: Pipe connections to precast concrete manholes shall be with A-LOK cast in-place gaskets for new and replacement manholes. Grout shall not be allowed to encase A-LOK gaskets. Pipe connections for cured in place or for existing pipe shall be KOR N SEAL flexible connectors. Proper torque shall be applied to KOR-N-SEAL flexible connectors with a torque wrench per manufacturer's specifications.
- H. Channels and benches shall be factory grouted only. There shall be no field grouting of channels or benches.
- I. Where possible a minimum line drop of 0.1 foot shall be provided across new manholes.
- J. Where the difference in invert elevation of two intersecting sewers in a manhole is 2 feet or more, a drop connection shall be installed as directed by the Purchaser.
- K. Where invert elevations are not shown on the Drawings, pipes of differing sizes enter and exit manholes, all pipe crowns shall be matched to the same elevation.
- L. The bottom of all precast base sections 4 feet in diameter will extend a minimum of 6-inches beyond the outside wall of the manhole riser. The bottom of all precast base sections and cast-in-place bases 5 feet in diameter will extend a minimum of 7-inches beyond the outside wall of the manhole riser. The bottom of all precast base sections and cast-in-place bases 6 feet and larger in diameter will extend a minimum of 8-inches beyond the outside wall of the manhole riser.
- M. For fewer manholes four to six feet in diameter and less than twenty feet deep, precast reinforced concrete manhole base sections shall be a minimum of 8 inches thick. For reinforced concrete manhole base sections shall be a minimum of 12 inches thick. All precast manhole base sections shall be reinforced with Number 4 steel reinforcing bars placed 6 inches on center each way and at mid depth of the slab, unless shown otherwise on the Drawings.

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- N. The interior of the manhole sections will be a smooth, cylindrical surface. Lifting holes, when provided, will be filled with expanding grout, or other approved materials.
- O. All precast reinforced concrete manhole sections specified herein shall be inspected by the Purchaser's Representative. All materials that fail to conform to these Specifications shall be rejected. After delivery to the Site, any materials that have been damaged in transit or are otherwise unsuitable for use in the Work shall be rejected and removed from the Site by the Subcontractor at no cost to the Owner.

2.10. EQUIPMENT

- A. The Subcontractor will furnish in good condition all equipment and facilities as required for the proper execution and inspection of the work. All equipment and facilities will be on site and approved by the Purchaser before work will be permitted to begin.

**PART 3 – CONSTRUCTION REQUIREMENTS**

3.01 SITE PREPARATION AND RESTORATION

A. Rights-of-Way and Easements

- 1. Rights of way and/or easements as shown on the Drawings and/or rights of way/easement plats are provided by the City to the Subcontractor for construction of sanitary sewer facilities. The Subcontractor will confine his construction activities to these areas. The Subcontractor will be responsible for obtaining written agreements for use of private property outside City acquired rights of way/easements for such purposes as storage of material and equipment and access to the construction site. The Subcontractor will immediately provide a copy of all such written agreements to the City and Purchaser upon obtaining the same.

B. Clearing of Rights-of-Way and Easements

- 1. The Subcontractor will confine his clearing of rights of way and easements to the least area necessary for construction of facilities shown on the Drawings. The Subcontractor will protect as many trees and shrubs within the area as possible. Where necessary for construction the Subcontractor will clear all live and dead vegetation and growth, pole stubs, logs, and other objectionable material. Cleared material will be removed to within 3 inches of existing ground. This work will be done well before excavation operations but only after erosion controls have been placed.

C. Location of Existing Obstructions

- 1. Locations of obstructions shown on the Drawings are approximate and are not intended as an accurate location of such obstructions. Obstructions not shown on the Drawings but encountered by the Subcontractor will be removed and replaced in their original state or protected by the Subcontractor at no additional cost to the Purchaser.

D. Removal of Obstructions

- 1. The Subcontractor will demolish and remove all structures and structure foundations, abandoned vehicles, appliances, and rubbish within the right of way/easement limits necessary for the performance of the work.

E. Protection of Obstructions Outside Easement Limits

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1. The Subcontractor will protect and avoid damage to all trees, shrubs, plants, fences, structures, and all other objects outside the right of way/easement limits shown on the Drawings and/or Plats due to construction operations. All damage will be repaired or restored at the Subcontractor's expense. Particular attention will be paid to avoid damage to trees, shrubs, bushes, and private property located next to rights of way/easements. No trees, plants, or other objects may be removed outside such limits without written permission of the property owner.

F. Special Protection of Obstructions Inside Easement Limits

1. Wherever the underground installation of sanitary sewer facilities will go through surface improvements previously made by the City, other governmental bodies, or property owners, the Subcontractor will be responsible for their protection and preservation. This responsibility includes the removal and storage of such improvements to allow replacement and restoration as close as possible to the undisturbed condition.

G. Disposal of Debris

1. All trees, brush, logs, snags, leaves, sawdust, bark, and refuse will be collected and disposed of according to the City Code of Ordinances at the expense of the Subcontractor. There will be no separate pay item for disposal of debris. Debris will be removed from the site when practical and will not be left until the completion of the contract. Burning of debris is not allowed. When material is to be disposed of outside the easement, the Subcontractor will first obtain written permission from the property owner on whose property the disposal is to be made and will file a copy with the Purchaser. Unless otherwise provided in the Contract Documents, the Subcontractor will arrange for disposing of such material outside the right of way/easement. No debris will be deposited in wetlands.

H. Replacement of Fences

1. Any fences disturbed inside the right of way/easement limits will be replaced or restored to their original or better condition. Any fences removed will be replaced in their original location. Fences in such poor condition that they cannot be taken down and rebuilt with the same material will be replaced with new fence material similar in original quality, size, construction, and appearance to the removed fence. Exceptions to this requirement will be allowed if written releases are obtained from the property owners by the Subcontractor and submitted to the Purchaser.

I. Restoration of Turfed Areas

1. All areas will be restored as nearly as practicable to their original condition. Finished lawn areas where soil has been deposited will be cleared to the level of the existing sod and then raked and watered. Areas where sod has been damaged, destroyed, or ruts have been filled will be resodded. After final restoration of the settled trench surfaces, trench areas and areas regraded as part of the construction will be resodded, unless otherwise shown on the Drawings or directed by the Purchaser. New sod shall consist of live, dense, well rooted growth of Bermuda grass, free from Johnson grass, nutgrass, and other obnoxious grasses or weeds, well suited for the intended purpose and for the soil in which it is to be planted. All sod shall be cleanly cut in strips having a reasonably uniform thickness. Subcontractor shall water sodded areas as frequently as required for a period of at least two weeks and shall apply fertilizer as necessary. Sod must be living at the time of final acceptance of the project.

3.02 BACKFILLING

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A. General

1. After sanitary sewer facilities have been bedded and installed according to these Specifications and upon permission of the Purchaser, the backfill may be placed. Backfilling operations will continue following as closely behind pipe installation as practical. All backfill will be placed in uniform horizontal layers. Pushing backfill material down a ramp into excavated areas will not be permitted. No trash will be allowed to accumulate in the space to be backfilled. Particular care will be taken to avoid allowing wood to be included in the backfill, other than sheeting and shoring that has been approved to be left in place.
2. The Subcontractor will be responsible for the condition of the trenches and filled areas during the contract and warranty period. The Subcontractor will maintain frequent inspection of the same. Anytime during the 12-month warranty period the trenches or filled areas settle and sunken places appear, the Subcontractor will be required to refill these sunken places when they are discovered with suitable material and will replace all damaged curb, gutter, and sidewalk. All soft or dangerous trenches will be marked, barricaded and caution lighted for the protection of the public.
3. Property with an existing dwelling located on it or lots within a developed subdivision or planned development are considered improved property.

B. Street Right of Way and Improved Property

1. Backfill Material: Backfill for pipe trench excavations through pavements in street or highway right of way or where the Purchaser orders, will be made with pit run gravel or other acceptable material as approved by the Purchaser. The backfill will be from the top of the pipe embedment material or manhole foundation to the subgrade elevation of the pavement. Pea gravel or similar granular material approximately uniform in size and without bonding properties will not be used.
2. Backfill for pipe trench excavations beyond pavements in street or highway right of way or outside public right of way will be made with select earth from the top level of the pipe embedment material or foundation to the subgrade elevation in paved area, or within 1 inch of the surface in areas to be sodded, or to the surface in all other areas.
3. Select material will be free from debris, organic matter, perishable compressible material and will contain no stones or lumps larger than 6 inches. Rocks and lumps smaller than 6 inches will not exceed an amount that will interfere with the consolidating properties of the fill material. Care will be taken that stones and lumps are kept separated and well distributed, and that all voids are completely filled with fine material. No rocks or lumps will come in direct contact with the pipe. The upper 3 feet of backfill in sodded or planted areas will be free of rocks or lumps larger than 1 inch in diameter.
4. Placement and Compaction: Backfill material will be placed by hand in 6 inch loose layers and tamped to a point 2 feet above the outside top of the pipe. Backfill will be compacted with suitable mechanical tamping equipment with special care being

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taken not to damage the pipe or joints. Use of compaction equipment directly above semi-rigid and flexible pipe should be avoided until sufficient backfill has been placed to ensure that the equipment will not damage the pipe. A minimum of 36 inches of compacted backfill above the top of semi-rigid and flexible pipe will be in place before wheel loading and a minimum of 48 inches of compacted backfill before use of pneumatic tampers. From these elevations to the subgrade elevation of the pavement, bottom of the sod, or to the original ground surface, suitable backfill will be mechanically placed in 9 inch, maximum, loose layers. All backfill material will be compacted to 95 percent of maximum density at plus or minus 2 percent of optimum moisture content as determined by Laboratory Standard Proctor Test (ASTM D 698).

C. Open Areas and Unimproved Property

1. Backfill of excavations on unimproved property will be made with select material from the top level of pipe embedment material or foundation to the surface. Non-granular select material to be used for backfill will be free from debris, organic matter and perishable compressible material, and will contain no stones or lumps or rock fragments larger than 6 inches. Rocks or lumps smaller than 6 inches in diameter will not exceed an amount that will interfere with the consolidating properties of the fill material. No rocks or lumps will come in direct contact with the pipe. Stones and lumps will be kept separated and well distributed, and all voids will be completely filled with fine material.

3.03 REMOVAL OF EXISTING MANHOLES

- A. Existing manholes and structures to be removed will be shown on the Drawings or as directed by the Purchaser. The City reserves the right to retain or reject salvage of any materials encountered. Unless otherwise specified, salvaged rims and covers remain the property of the City and will be delivered by the Subcontractor to the City yard as directed by the Purchaser. All remaining materials become the property of the Contractor who shall be responsible for disposal.

3.04 GENERAL CONSTRUCTION REQUIREMENTS

- A. New manholes and structures will be constructed of plain or reinforced concrete. Where the top elevation is not shown on the Drawings, the manhole or structure shall be built to conform to the elevation ordered by the Purchaser. Standard depth manholes are those having a depth of 6'-0" from rim to invert of the sewer. Completion of the manhole will include the installation of fittings, connections to pipes, placing of castings, testing, and other construction as shown on the Drawings.
- B. Inlet and outlet pipes will extend through the walls of manholes to allow for water tight connections with the manhole walls. The ends will be cut off flush with the inside surface of the wall as shown on the Drawings, design standards, or otherwise directed by the Purchaser. The pipes will intersect at the structures so the inlet pipe will be aligned in the direction of outlet pipe such that counterflow is prevented. Water stops will be installed around pipes as they pass through the sanitary manhole wall.
- C. Inverts will be of Class A concrete poured to conform to the shapes shown on the Plans or otherwise directed. The inverts will be constructed as to cause the least possible resistance to flow. The shape of the inverts will conform uniformly to inlet and outlet pipes. A smooth and uniform finish will be required.



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D. Dewatering

1. Subcontractor shall furnish, install and operate pumps, pipes, appurtenances, and all equipment of sufficient capacity required to remove any groundwater encountered in the excavation. Subcontractor shall conduct said groundwater away from the construction site in an approved manner. Generally, dewatering is considered to be an incidental to the construction of sewer manholes.

E. Bypass Pumping

1. Contractor shall furnish, install, and operate pumps, pipes, appurtenances, and all equipment of sufficient capacity required to maintain sewage flow around the work area. Contractor shall conduct said bypass pumping in an approved manner. Generally, bypass pumping is considered to be an incidental to the construction of sewer manholes.

F. Traffic Control

1. All traffic control shall be installed and maintained in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). At a minimum, the Subcontractor must have two trucks with flashing yellow lights on the work site. Traffic cones must also be placed downstream of the construction site to divert cars into the adjacent lane(s) per MUTCD requirements. On roads with heavy traffic volume, a flagman may also be needed to assist with traffic control. For bidding purposes, the Subcontractor should assume that a flagman will be needed on 30 percent of the setups.

3.05 INSTALLATION – PRECAST MANHOLES

A. Manhole Foundations

1. Precast concrete manholes shall be built according to the Drawings or as directed by the Purchaser. All precast manholes will use either a concrete slab constructed of Class A concrete on a 12-inch thick No. 67 crushed limestone foundation and will be cast integrally with the base section and the inlet and outlet pipes as shown on the Drawings or the precast manhole will use a precast base section conforming to this specification. The stone base will be fully encapsulated in a geotextile fabric as indicated on the plans or as directed by the Purchaser. The Subcontractor shall dewater sufficiently to maintain the ground water level at or below the bottom of the manhole foundation prior to and during placement of the foundation.

B. Manhole Installation on Existing Lines

1. For all lines 12 inches in diameter or less, a section of pipe shall be removed and a complete precast manhole installed. The existing pipes shall be joined by a flexible coupling to pipe extensions from the manhole. Minimum 4-foot pipe extension shall be required from manhole to connect to existing pipe.

C. Manhole Diameters

1. In general, the internal diameter of manholes shall be 4 feet.
2. Manhole diameter sizing, however, is contingent upon limitations of manufacturer due to pipe sizes and pipe deflections at manhole. Subcontractor shall verify proper manhole diameter is provided based on proposed manhole pipe configuration and pipe sizes indicated. Manhole sizing shall be approved by the Purchaser.

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D. Frames and Covers

1. Cast iron frames and covers shall be set at the required elevation and properly bonded to the masonry with two rings of butyl mastic sealant and anchor bolts.
2. City standard watertight frame and cover shall be used in flood prone areas, and areas where water ponds or could pond, including traffic areas.
  - a. Where shown on the Drawings, vents shall be installed in long runs of sewers, potentially with watertight frames and covers. Vents shall be designed and constructed to preclude water entering the sewer system during storm events through the vents.
3. City standard frame and cover shall be used in all other areas.
4. Manhole rim elevations shall be set at grade in traffic areas and finished landscaped areas (finished grade is at the top of mulch in finished landscape areas), shall be set at 3 inches above grade in nonfinished landscaped areas, and to be set at 2 feet or more above finish grade in nontraffic and nonlandscaped areas.
5. Wherever manholes are constructed in paved areas, the top surface of the frame and cover shall conform to the exact slope, crown, and grade of the existing adjacent pavement.

**PART 4 – ACCEPTANCE AND DELIVERABLES**

4.01 MANHOLE ACCEPTANCE

- A. All manholes shall be subject to visual inspection by the Purchaser's Representative for faults, defects, or deviations from the Drawings and any such deviation or omission will be corrected by the Subcontractor. All tests shall be made by the Subcontractor who will provide necessary equipment for testing in the presence of and under the supervision and instructions of the Purchaser's Representative.

4.02 MANHOLE VACUUM TESTING FOR PRECAST MANHOLES

- A. The Subcontractor shall provide all labor and equipment for vacuum testing.
- B. All manholes are to be vacuum tested following backfill and compaction. The ring and lid casting assembly shall be installed prior to testing. The testing equipment shall consist of a gasoline-powered vacuum pump with sufficient vacuum hose length and a test head of proper size to fit the inside opening of the manhole. The test head shall be equipped with an inflatable rubber bladder to affect the seal to the manhole, an air pressure gauge, and a safety valve for filling the bladder, a 30 inch Hg liquid-filled vacuum gauge, a double air exhaust manifold with quarter turn ball valves, three bolt-on feet, and a bridge assembly with height adjustment rod.
- C. Subcontractor shall plug all pipe openings, taking care to securely brace the plugs and the pipe. The plugs shall be placed a minimum of 6 feet beyond the manhole wall.
- D. With the vacuum tester in place, inflate the compression to affect a seal between the vacuum base and the structure. Connect the vacuum pump to the outlet port with the valve open and evacuate the manhole to 10 inches Hg (0.3 bar) for 48 inch diameter manholes and 5 inches Hg (0.15 bar) for 60-inch and greater diameter manholes.
- E. Close vacuum inlet/outlet ball valve, disconnect the vacuum pump, and monitor the

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vacuum for the specified time period. If the vacuum does not drop in excess of 1 inch Hg over the specified time period, the manhole is considered acceptable passes the test. If the manhole fails the test, identify the leaking areas by removing the head assembly, coating the interior surfaces of the manhole with a soap and water solution, and repeating the vacuum test for approximately thirty seconds. Once the leaks have been identified, complete all necessary repairs by sealing the leaks of the manhole to the satisfaction of the Purchaser, and repeat test procedures until satisfactory results are obtained.

<b>Vacuum Test Timetable</b>			
<b>Depth (Feet)</b>	<b>Manhole Diameter (Inches)</b>		
	<b>48"</b>	<b>60"</b>	<b>72"</b>
4'	10 sec.	13 sec.	16 sec.
8'	20 sec.	26 sec.	32 sec.
12'	30 sec.	39 sec.	48 sec.
16'	40 sec.	52 sec.	64 sec.
20'	50 sec.	65 sec.	80 sec.
24'	60 sec.	78 sec.	96 sec.
*	5.0 sec.	6.5 sec.	8.0 sec.

\*Add extra testing time "T", for each additional 2-foot depth. (The values listed above have been extrapolated for ASTM designation C924-85.

4.03 WARRANTY AND GUARANTEE FOR PRECAST MANHOLES

- A. The Contractor shall guarantee the rehabilitated manholes for ten (10) years after acceptance by the Owner to the extent that he will repair any leaks that may appear in them during this period because of faulty workmanship or materials furnished by him at no additional expense to the Owner.

4.04 MEETINGS

- A. The Program Team will arrange bi-weekly (every other week) meetings with the contractor to discuss progress and field issues.

4.05 DELIVERABLES

- A. The Subcontractor shall provide post-rehabilitation MACP inspections for each manhole in accordance with Specification 00001 – Manhole GPS and MACP Inspection.

**PART 5 – MEASUREMENTS**

5.01 SITE PREPARATION AND RESTORATION

- A. The area to be considered for measurement will be the limit of the construction area unless otherwise directed by the Purchaser.
- B. When the Proposal Sheet(s) do(es) not contain an item for Site Preparation and Restoration, this work will be required within the construction limits and will not be paid

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for directly but will be considered as a subsidiary obligation of the Subcontractor under other contract items.

5.02 PRECAST MANHOLE REPLACEMENT

- A. Precast manhole replacement shall be measured per vertical foot of manhole from the downstream invert up to the bottom of the frame casting.

5.03 PRECAST MANHOLE INSTALLATION

- A. Precast manhole installation shall be measured per vertical foot of manhole from the downstream invert to the bottom of the frame casting.

5.04 PAVEMENT BACKFILL

- A. Pit run gravel or other acceptable material used for backfill under pavements or other areas directed by the Purchaser will be measured by the cubic yard in the following manner. Cubic yards of Pavement Backfill equals the linear feet of sewer pipe installed directly below pavement as measured along the centerline of the pipe multiplied by the trench payline width in feet multiplied by the depth of pavement backfill material in feet divided by 27. The trench payline width is defined as the outside diameter of the sewer pipe plus 2 feet. The depth of pavement backfill is defined as the distance from 6 inches above the top of the sewer pipe to the subgrade elevation of the pavement.

5.05 TRAFFIC CONTROL

- A. Traffic control will be paid per each manhole installed or replaced.

5.06 DEWATERING

- A. Dewatering is considered to be an incidental to sewer manhole rehabilitation.

5.07 BYPASS PUMPING

- A. Bypass pumping is considered to be an incidental to sewer manhole installation and replacement.

5.08 VENT STACK

- A. Vent stacks will be measured per each set consisting of stack pipe, 180° bend and support. No measurement of height will be made.

5.09 SEWER MANHOLE RIM & COVER

- A. Manhole rims and covers will be measured per each set consisting of one rim and one cover for the various types.

5.10 SEWER MANHOLE DROP CONSTRUCTION

- A. Drop construction in new or existing manholes will be measured per vertical foot as measured from the upper inlet pipe flowline to the flowline of drop pipe elbows at the bottom of the drop construction. Payment for drop construction for new manholes will be in addition to payment for precast manhole installation (if required).

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**PART 6 – PAYMENT**

6.01 SITE PREPARATION AND RESTORATION

- A. Payment will be made for Site Preparation and Restoration at the contract lump sum price, which will be full compensation for removal of trees, shrubs, plants, brush, rubbish, fences, manmade obstructions including but not limited to structures, abandoned cars and appliances, building foundations, and all other obstructions as may be directed by the Purchaser; the disposal of debris, removing of obstructions, and the restoration of fences, turfed areas, and all other items will be as specified in the Drawings and Contract Documents or as directed by the Purchaser.

6.02 PRECAST MANHOLE REPLACEMENT

- A. Precast Manhole replacement payment shall include base, precast sections, adjusting rings, as needed, gaskets, steps, cast-in or core drilled pipe openings, pipe connectors, grout, and vacuum testing, and removal and approved offsite disposal of materials.

6.03 PRECAST MANHOLE INSTALLATION

- A. Precast Manhole installation payment shall include base, precast sections, adjusting rings, as needed, gaskets, steps, cast-in or core drilled pipe openings, pipe connectors, grout, and vacuum testing, and removal and approved offsite disposal of materials.

6.04 PAVEMENT BACKFILL

- A. Accepted quantities of pit run gravel or other acceptable material used for backfill under pavements or other areas designated by the Purchaser will be paid for at the contract unit price per cubic yard furnished and placed, which will be full compensation for furnishing, placing and compacting the selected material.

6.05 TRAFFIC CONTROL

- A. Traffic control will be paid per each manhole rehabilitated including all appurtenances required to comply with MUTCD standards.

6.06 DEWATERING

- A. Dewatering is considered to be an incidental to sewer manhole rehabilitation. No payment will be made for this item.

6.07 BYPASS PUMPING

- A. Bypass Pumping is considered to be an incidental to sewer manhole rehabilitation. No payment will be made for this item.

6.08 VENT STACK

- A. The accepted quantities of vent stacks will be paid for at the contract unit price per each, complete in place, which will be full compensation for materials and materials' testing, fabrication, painting, and installation of vent stacks.

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6.09 SEWER MANHOLE RIM & COVER

- A. The accepted quantities of sewer manhole rim and cover set will be paid for at the contract unit price per each complete in place for various types which price will be full compensation for materials and materials' testing, setting rim and cover, placing gaskets and bolts, protection and curing of mortar, and cleaning and inspection.

6.10 SEWER MANHOLE DROP CONSTRUCTION

- A. The accepted quantities of sewer manhole drop construction will be paid for at the contract unit price per vertical foot, complete in place for drop construction in new manholes or drop construction in existing manholes, which will be full compensation for materials and materials testing, excavation, special protection, maintenance of sewage flow during construction, construction of drop pipe, pipe fitting and connections, installation of steel support straps, placement, curing, and protection of concrete from the manhole base to the top of drop construction, cleaning and inspection, and backfilling outside of pavement areas. Payment for drop construction for new manholes will be in addition to payment for standard depth manhole and extra depth construction (if required).

6.11 PAYMENT WILL BE MADE UNDER:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02531-6.01	SITE PREPARATION AND RESTORATION	Lump Sum
02531-6.02	PRECAST MANHOLE REPLACEMENT	Vertical Foot
02531-6.03	PRECAST MANHOLE INSTALLATION	Vertical Foot
02531-6.04	PAVEMENT BACKFILL	Cubic Yard
02531-6.05	TRAFFIC CONTROL	Each
02531-6.08	VENT STACK	Each
02531-6.09.01	NO. 7 SEWER MANHOLE RIM & COVER	Each
02531-6.09.02	SEWER MANHOLE WATER TIGHT RIM & COVER	Each
02531-6.09.03	SEALED MANHOLE FOR VENT STACK	Each
02531-6.09	SEWER MANHOLE DROP CONSRUCTION	Vertical Foot

**END OF SECTION 02531**

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**PART 1 – SCOPE**

- 1.01 This Work shall consist of the removal and replacement of pavements, sidewalks, driveway aprons, curbs and gutters, driveways, paved areas, and curbs made necessary by the improvement of sanitary sewer infrastructure, and other items of construction that require temporary cuts. Such replacement shall be to a condition at least equal to the condition existing prior to removal and of in-kind material and shall be compliance with the Drawings, these Specifications, or as directed by the Purchaser. The Work which will be included in the Subcontract and for which the Subcontractor shall be compensated therefore is limited to that area within the rights-of-way and construction easements for the Project. The Subcontractor will not be compensated for the removal and replacement of facilities outside the rights-of-way, easements, and limits of construction of the Project.

**PART 2 – MATERIALS AND EQUIPMENT**

2.01 MATERIALS

- A. Concrete: Portland cement concrete shall be in accordance with Section 03050 Portland Cement Concrete.
- B. Asphaltic Concrete Pavement: Asphaltic concrete surface courses shall meet the requirements of Mix No. 1 and bases courses shall meet the requirements of Mix No. 2 as described below.
1. The composition of the mixes shall be as follows:

Total Percent Passing by Weight

<u>Sieve Size</u>	<u>Mix No. 1</u>	<u>Mix No. 2</u>
2"	100	100
1-1/2"	100	100
3/4"	100	100
3/8"	76 - 96	65 - 95
No. 4	51 - 76	45 - 70
No. 8	36 - 60	25 - 50
No. 30	16 - 40	12 - 30
No. 100	3 - 12	2 - 12
No. 200	2 - 8	1 - 6

2. The proportions of the total mixture, in percent by weight, shall be as follows:

<u>Courses</u>	<u>Combined Mineral Aggregate</u>	<u>Asphalt Cement</u>
Mix No. 1, Surface	92.0 – 96.0	4.0 – 8.0
Mix No. 2, Binder	93.0 – 97.5	2.5 – 7.0

3. It is the intent of this Section of the Specifications that the above described mixes shall conform to the following mixtures specified in the Tennessee Department of Transportation Standard Specifications for Road and Bridge construction.

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Mix No. 1 – Section 411, Asphaltic Concrete Surface (Hot Mix), Grading E.  
 Mix No. 2 – Section 307, Bituminous Plant Mix Base (Hot Mix), Aggregate Grading C.

4. For multiple layer construction, succeeding layers shall not be laid until the previous layer has cooled sufficiently to support the construction equipment
  5. When Mix No. 1 is to be used as a surface for traffic lanes, the mineral aggregate shall be composed of not less than 50 percent nor more than 55 percent crushed limestone and not more than 50 percent nor less than 45 percent natural sand. When Mix No. 1 is used for surfacing of shoulders or other non-traffic lane construction, the mineral aggregate may be composed entirely of limestone, including screening and manufactured sand, but in no case shall the mineral aggregate for this construction consist of less than 50 percent limestone. The natural sand shall be so graded that not more than 5 percent will be retained on the No. 4 sieve.
- C. Expansion Joint Filler: Preformed expansion joint filler shall be of the bituminous type, shall conform to the requirements of AASHTO M 213 and shall not be more than 1 inch or less than 1/2 inch in thickness. The filler shall be cut to the full depth of pavement, curb and gutter, sidewalk, or driveway being replaced.
- D. Gravel Pavement or Base: Crushed limestone with such material as manufactured sand or other fine materials naturally contained or added thereto as needed to match existing conditions and conform to the gradations shown below:

Grading Table for Graded Aggregate Base Course  
 Total Percent, by Dry Weight, Passing Each Sieve (U.S. Standard)

<u>Size No.</u>	<u>2 1/2"</u>	<u>2"</u>	<u>1 1/2"</u>	<u>1"</u>	<u>3/8"</u>	<u>No. 40</u>
1	100	95-100			35-65	10-30

2.02 EQUIPMENT

- A. Equipment and tools necessary for cutting, removal, and hauling of existing items; handling and placement of new material; and all equipment necessary to perform all parts of the Work shall be at the job site sufficiently ahead of the start of construction operations to be examined and approved by the Purchaser.
- B. When saws are used to cut pavement, the Subcontractor shall provide sawing equipment adequate in power to complete the sawing to a minimum of 1-1/2 inches below the pavement surface in one pass. An ample supply of saw blades shall be maintained at the site of the Work at all times during sawing operations.
- C. Other types of pavement cutting equipment shall be capable of cutting the pavement to a neat straight line of 1-1/2 inch minimum depth below the pavement surface in one pass.
- D. The Subcontractor shall provide equipment capable of removal of pavements, sidewalks, driveway aprons, curbs and gutters, driveways, paved areas, and curbs without disturbance of adjacent items to remain in place.

**PART 3 – CONSTRUCTION REQUIREMENTS**

3.01 REMOVAL OF ASPHALT PAVEMENT



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Asphalt pavement shall be removed to a clean straight line as shown on the drawing details. Pavement shall be cut by saw or other equipment approved by the Purchaser in advance. Edges of existing asphalt pavement adjacent to trenches, where damaged, shall be recut in a clean straight line within the limits of damaged pavement only. Such recuts shall be parallel to the original cuts and perpendicular to the pavement surface.

**3.02 REMOVAL OF CONCRETE PAVEMENT**

Concrete pavement shall be removed to a neat straight line as shown on the drawing details. Care shall be used to avoid damage to pavements and to the pavement base remaining in place.

**3.03 REMOVAL OF CONCRETE SIDEWALK, CURB AND GUTTER, AND DRIVEWAY**

Concrete sidewalks, curbs and gutters, and driveways shall be removed to the nearest contraction or expansion joint. Care shall be used to avoid damage to sidewalks, curbs and gutters, and driveways remaining in place.

**3.04 REMOVAL OF GRAVEL PAVEMENT**

Gravel surfaces encountered in construction shall be removed as needed to allow for the adjustment of the manhole frame and cover.

**3.05 REPLACEMENT OF PAVEMENT**

**A. Asphalt Pavements**

1. Replace asphalt paving courses to match existing thickness. The minimum surface course thickness shall be 2 inches. Asphalt pavement and base replacement shall be constructed for the entire cross-section of pavement removal area including all areas where pavement was re-cut subsequent to the initial pavement removal.

**B. Concrete Pavements**

1. Concrete pavement shall be replaced with Class A concrete pavement equal in thickness to the pavement removed but not less than 4 inches thick. Concrete pavement and base replacement shall be constructed for the entire cross-section of pavement removal area including all areas where pavement was re-cut subsequent to the initial pavement removal.

2. Reasonable efforts shall be made to avoid contrast in the color and texture of existing and restored surfaces.

**C. Placing, Curing, and Protection of Concrete**

1. After the backfill in the trench has been brought to the appropriate subgrade elevation shown on the Plans, compacted to the specified density, and permission has been given by the Purchaser, a concrete slab of the appropriate thickness shall be placed within the entire disturbed area.

2. Any loose or disturbed pavement or base shall be removed prior to placement of the concrete. Concrete shall be placed only on a moist subgrade and shall not be placed unless the ambient temperature is 35° F and rising. In no case shall concrete be placed on a frozen or frosty subgrade. After the concrete is placed, it shall be struck off in an approved manner to the appropriate grade as shown on the Plans and shall be finished with floats and straight edges until the required surface texture has been obtained.

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3. No vehicles or loads shall be permitted on any concrete until the Purchaser has determined that the concrete has obtained sufficient strength for such loads. The Subcontractor shall construct and place such barricades and protection devices as are necessary to protect the concrete.

**3.06 REPLACEMENT OF SIDEWALKS, DRIVEWAY APRONS, CURBS AND GUTTERS,  
DRIVEWAYS AND OTHER PAVED AREAS, AND CURBS**

A. Concrete sidewalks and driveway aprons shall be replaced in accordance with the City of Memphis Standard Construction Specifications.

B. Unless otherwise directed, curb and gutter shall be replaced with new concrete curb and gutter of the same cross-section and at the same top of curb elevation and flow line as that removed. Where curb and gutter of a different type than existing is to be used for replacement, the replacement flow line shall match existing and a transitions section provided between the existing and replacement cross-sections. Curb heights shall be transitioned at a rate of 1 inch in 5 feet. Granite curb shall be replaced with new concrete curb whose height matches existing adjacent curb top elevations. Any expansion joint material removed shall be replaced at the original locations. Existing concrete edges shall be cleaned prior to placement of concrete. The finished curb and gutter cross-section, elevations, texture, and color shall conform to the adjacent concrete surfaces.

C. Replacement of paved areas other than street pavement; concrete, asphalt, or gravel driveways; and asphalt or concrete curb within the right-of-way or construction easement limits shall be in kind for those cross-sections removed, unless directed otherwise by the Purchaser.

**3.07 DAMAGE DUE TO SETTLEMENT**

A. The Subcontractor shall be responsible for any damage caused by settlement of backfill placed beneath pavements, sidewalks, driveway aprons, curbs, curbs and gutters, driveways, paved areas other than street pavement, and asphalt or concrete curb within the right-of-way or construction easement limits. This includes any damage which may occur at any time prior to, and during a period of one year from the date of Final Completion of the Work covered by the Subcontract.

B. During such period, the Subcontractor shall at his own cost and expense refill all excavations where settlement damage has occurred and replace damaged pavements, sidewalks, driveway aprons, curbs, curbs and gutters, paved areas, driveways, and all other damaged items to the satisfaction of the Purchaser. Should the Subcontractor fail to repair settlement damage which may occur as described above within 5 days after being given notice thereof, the Purchaser shall have the right to repair such settlement and charge the cost of such repairs to the Subcontractor.

**3.08 DAMAGE OUTSIDE CONSTRUCTION EASEMENT LIMITS**

The Subcontractor will be held responsible for all damage to roads, highways, shoulders, curbs and gutters, ditches, embankments, bridges, culverts, and other property, caused by him or any of this Sub-subcontractors in hauling or otherwise transporting materials to and from the several sites of Work, regardless of the location of such damage. The Subcontractor shall make arrangements relative to the payment for, or repair or replacement of, such damage or damaged surfaces or structures which are satisfactory and acceptable to the Purchaser, at the Subcontractor's cost and expense.

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PART 4 – MEASUREMENT**

- 4.01 PAVEMENT REMOVAL AND REPLACEMENT  
Pavement removal and replacement shall be measured for payment by the square yard, complete in place.
- 4.02 CONCRETE SIDEWALK REMOVAL AND REPLACEMENT  
Sidewalk removal and replacement shall be measured for payment by the square foot, complete in place.
- 4.03 CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT  
Curb and gutter removal and replacement shall be measured for payment by the linear foot, complete in place.
- 4.04 GRAVEL DRIVEWAY AND GRAVEL AREA REMOVAL AND REPLACEMENT  
Gravel driveways and gravel area removal and replacement shall be measured for payment by the ton of crushed limestone, complete in place.

**PART 5 – PAYMENT**

- 5.01 PAVEMENT REMOVAL AND REPLACEMENT  
The accepted quantities of pavement removal and replacement shall be paid for at the Subcontract unit price per square yard for the type specified, which price will be full compensation for cutting and recutting pavement; removal and disposal of pavement and base; preparing the subgrade; placing, finishing, curing, and protection of concrete; and placing and compacting asphaltic concrete wearing surfaces, complete in place.
- 5.02 CONCRETE SIDEWALK REMOVAL AND REPLACEMENT  
The accepted quantities of sidewalk removal and replacement shall be paid for at the contract unit price per square foot, which price will be full compensation for removal and disposal of sidewalk; preparing the subgrade; and placing, finishing, curing and protection of concrete, complete in place.
- 5.03 CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT.  
The accepted quantities of curb and gutter removal and replacement shall be paid for at the Subcontract unit price per linear foot for the type specified, which price will be full compensation for removal and disposal of curb and gutter; preparing the subgrade; and placing, finishing, curing and protection of concrete, complete in place.
- 5.04 GRAVEL DRIVEWAY AND GRAVEL AREA REMOVAL AND REPLACEMENT  
The accepted quantities of gravel driveway and gravel area removal and replacement shall be paid for at the Subcontract unit price per ton of crushed limestone, which price will be full compensation for preparing the subgrade and replacing the gravel, complete in place.
- 5.05 PAYMENT WILL BE MADE UNDER:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02950-5.01.01	Asphaltic Concrete Pavement Removal and Replacement	Square Yard
02950-5.01.02	Concrete Pavement Removal and Replacement	Square Yard
02950-5.02	Concrete Sidewalk Removal and Replacement	Square Foot

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02950-5.04	Concrete Curb And Gutter Removal and Replacement	Linear Foot
02950-5.05	Gravel Driveway And Gravel Area Removal and Replacement with Crushed Stone	Ton

**END OF SECTION 02950**

# **CITY OF MEMPHIS - STANDARD CONSTRUCTION SPECIFICATIONS**

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### **SECTION 03310 CONCRETE STRUCTURES**

#### **PART 1 – SCOPE**

1.01 This work shall consist of the construction of all structures, or parts of structures, composed of Portland cement concrete whether plain, reinforced, or a combination of both. Concrete structures shall be constructed of Class A Concrete, unless otherwise specified. They shall be constructed on prepared foundations, at the locations indicated or directed in conformity with the dimensions, lines and grades shown on the Plans or as directed by the Purchaser and in accordance with these Specifications.

1.02 The concrete used in this construction shall be composed of a mixture or mixtures of Portland cement, aggregates, air-entraining agents, water, and chemical additives when approved, combined by the methods and in the proportions defined for the particular class of concrete designated as shown in Specification Section 03050.

1.03 Parts of a structure, or structures, indicated to be constructed with materials other than Portland cement concrete and concrete reinforcement steel shall be constructed in accordance with the provisions set out in the Specification Section covering the particular type of construction.

#### **PART 2 – MATERIALS AND EQUIPMENT**

##### 2.01 MATERIAL

A. Materials used in this construction shall meet the requirements of the applicable Sections or Paragraphs of Specification Section 03050, "Portland Cement Concrete" and the following:

B. Waterstops.

1. Waterstops shall be of the type, shape, and dimensions shown on the Plans.

2. Metallic.

Metallic waterstops shall be sheet copper conforming to the requirements as specified in the current Specifications for Copper Sheet, Strip, Plate, and Rolled Bar, Type ETP, ASTM Designation B 152. The weight per square foot shall be as specified on the Plans.

3. Nonmetallic

a. Nonmetallic waterstops shall be manufactured from either natural rubber, synthetic rubber, or polyvinylchloride (PVC) at the option of the Subcontractor. Waterstops shall be produced by such a process that, as supplied for use, they will be dense, homogeneous, and free from holes and other imperfections. The cross-section of the waterstop shall be uniform along its length and transversely symmetrical so that the thickness at any given distance from either edge of the waterstop will be uniform.

b. Rubber Waterstop.

(1) The waterstop shall be fabricated from a high grade thread-type compound. The basic polymer shall be natural rubber or a copolymer of butadiene and styrene, or a blend of both. The compound shall contain no less than 70 percent by volume of the basic polymer, and remainder shall consist of reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents and plasticizers, but shall contain no factice.

(2) Samples taken from the finished waterstop shall meet the following requirements when tested in accordance with the current specified ASTM method of test.

ASTM

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**SECTION 03310 CONCRETE STRUCTURES**

<u>Title</u>	<u>Requirement</u>	<u>Method of Test</u>
Tensile Strength (Die "C")	2500 psi. min.	D 412
Ultimate Elongation (Die "C")	450 percent, min.	D 412
Shore Durometer Hardness	60-70	D 2240
Specific Gravity	1.15 + 0.03	D 297 (Sec. 17)
Water Absorption (% by Wt.)	5 percent, max.	D 570
Tensile Strength after accelerated Aging, oxygen-pressure method	80 percent, min.	D 572

c. Polyvinylchloride Waterstop.

(1) This waterstop shall be extruded from an elastomeric plastic material. The material shall be a plastic compound, the basic resin of which shall be polyvinylchloride. The compound shall contain any additional resins, plasticizers, stabilizers, or other materials needed to insure that when the material is compounded it will meet the performance requirements of this Specification. No reclaimed polyvinylchloride shall be used.

<u>Title</u>	<u>Requirement</u>	<u>ASTM Method of Test</u>
Tensile Strength (Die "C")		
Sheet Material	2,000 psi	D 412
Finished Waterstop	1,700 psi	D 412
Ultimate Elongation (Die "C")		
Sheet Material	350% Min.	D 412
Finished Waterstop	300% Min.	D 412
Stiffness in Flexure	750 psi Min.	D 747
Accelerated Extraction		CRD C 572
Tensile Strength (Die "C")	1,750 psi	D 412
Elongation (Die "C")	300%	D 412
Effect of Alkali (After 7 Days)		
Change in Weight	-0.1 to +0.25%	
Change in Hardness, Shore Durometer	+ or - 5%	
Low Temperature Brittleness	-35°	D 746
Specific Gravity	1.3	D 792

(2) For polyvinylchloride waterstops, the supplier shall submit a certificate stating that all of the performance requirements specified for the sheet material under Polyvinylchloride Waterstops have been complied with. Field splices for Polyvinylchloride waterstops shall be performed by heat sealing the adjacent surfaces in accordance with the manufacturer's recommendations. Waterstops shall be manufactured with an integral cross-section which shall be uniform within plus or minus 1/8 inch in width, and the web thickness or bulb diameter within plus 1/16 inch and minus 1/32 inch.

(3) The Subcontractor shall furnish the Purchaser at this request and at no cost to the Purchaser a certified test report from an approved laboratory covering each lot or unit of finished waterstops. These test reports shall contain the numerical laboratory test data of the required test.

**B. Epoxy Resin Systems.**

Two Component epoxy resin systems shall conform to the requirements of the appropriate class designation of AASHTO M 200, M 234, M 235, unless otherwise designated on the Plans or in the Contract. The appropriate class designation is determined by the proposed use of the material.

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1. Requirements for Specific Uses:

a. Bonding fresh concrete to cured concrete.

Requirements: The material shall meet the compositional specification for AASHTO M 235, Class I and applicable requirements of the Class III performance specification.

b. Bonding cured concrete to cured concrete.

Requirements: The material shall meet the compositional specification of AASHTO M 235, Class II and the applicable requirements of the Class III performance specification.

c. Binder in epoxy resin concrete and mortar for repairing spalls and other defects in concrete.

Requirements: The material shall meet the compositional specification of AASHTO M 235, Class II and the applicable requirements of the Class III performance specification.

C. Bar Reinforcement.

Unless otherwise specified, all steel reinforcement for concrete shall be billet steel bars conforming to the requirements of ASTM A 615.

D. Dowel Bars.

Dowel bars shall be plain and shall conform to the requirements of ASTM A 306, Grade 55, 60, 65, or 70.

E. Welded Wire Fabric.

Fabric for reinforcement shall conform to ASTM A 185, or as indicated on the Plans, and shall be supplied in mats of the size, design and weight shown on the Plans.

2.02. EQUIPMENT.

A. Equipment and tools necessary for handling materials and performing all parts of the Work shall be subject to approval by the Purchaser as to design, capacity, and mechanical condition. Equipment shall be on hand sufficiently ahead of the start of construction operations to be examined and approved. The equipment and organization shall be of sufficient capacity to accomplish the maximum continuous concrete placement, as governed by the construction joints shown on the Plans or as directed by the Purchaser.

B. The requirements for batching plant and mixers shall be as prescribed in Specification Section 03050.

C. Ample and satisfactory equipment for conveying concrete from the mixer to final position in the forms shall be provided. Closed chutes or pipes shall be used when concrete is to be dumped or dropped for a distance greater than 5 feet. Where steep slopes are required, the chutes shall be equipped with baffle boards or shall be in short lengths that will enable the direction of movement to be reversed.

D. Vibrators shall be of an approved type and design and shall operate under load at a rate as recommended by the manufacturer and approved by the Purchaser.

**PART 3 – CONSTRUCTION REQUIREMENTS**

3.01 FORMS.

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A. Construction.

1. Forms shall be mortar-tight and sufficiently rigid to prevent distortion due to the pressure of the concrete and other stresses incidental to the construction operations, including vibration. Forms shall be so constructed and maintained as to prevent the opening of joints due to shrinkage of the lumber.
2. The forms shall be built true to line and grade and shall be held in place by means of studs or uprights, and waling, which shall be sufficiently and substantially braced and tied.
3. All forms and studding shall be cut off and capped with not less than a 2 inch by 4 inch piece so that the top of the cap will be at the elevation of the finished exposed surface of the concrete.
4. All edges shall be chamfered with  $\frac{3}{4}$  inch material, unless otherwise specified. All chamfer strips shall be straight, of uniform width, and dressed.
5. Wood devices of any kind used to separate forms shall be removed before placing concrete within 4 inches of such devices.

B. Form Lumber.

1. Form lumber for all exposed concrete surfaces shall be dressed at least on one side and two edges and shall be so constructed as to produce mortar-tight joints and smooth, even concrete surfaces.
2. Plywood forms, or forms face-lined with plywood, masonite, or other approved similar material may be used, provided the plywood forms and form linings are substantial, of uniform thickness, and are mortar-tight when in position.

C. Metal Ties.

Metal ties or anchorages within the forms shall be so constructed as to permit their removal to a depth of at least one inch from the face without injury to the concrete. In case wire ties are permitted, the wires shall be cut back at least  $\frac{1}{4}$  inch from the surface of the concrete, and the surface left sound, smooth, even, and uniform in color.

D. Walls.

Sufficient openings shall be provided at intervals along the bottom of wall forms to permit thorough cleaning prior to concrete placement. Such openings shall be closed before placing concrete in the forms.

E. Surface Treatment.

Prior to placing reinforcement, all forms shall be treated to prevent the adherence of concrete. Forms not provided with a special treatment shall be treated with an approved oil. Any material that will adhere to or discolor the concrete shall not be used.

F. Metal Forms.

1. The specifications for forms, as regards design, mortar tightness, filleted corner, beveled projections, bracing, alignment, removal, and reuse and oiling apply to metal forms. The metal used for forms shall be of such thickness that the forms will remain true to shape. All bolt and reet heads shall be countersunk on the face forming the concrete surface. Clamps, pins, or other connecting devices shall be designed to hold the forms rigidly together and to allow removal without injury to the concrete. Metal forms which do not present a smooth surface or do not line up properly shall not be used. Care shall be exercised to keep metal forms free from rust, grease, or other foreign matter.



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2. When the Subcontractor wishes to utilize a special forming system not specifically authorized in this Specification, he shall submit his design and calculation to the Purchaser for review and approval.

**3.02 FALSEWORK.**

A. The falsework used to support the forms and concrete for concrete structures shall be supported on sills resting on rigid foundations composed of piles driven until the bearing capacity of each pile is sufficient to support the load to which it will be subjected, or earth-borne footings as hereinafter provided.

B. Earth-borne footings will be permitted only when, in the opinion of the Purchaser, the soil can adequately support the superimposed loads and the following conditions are met:

1. Spread footings will only be permitted on stable ground, capable of supporting the superimposed load.

2. The site is graded and so maintained to prohibit ponding of water or erosion of soil in the proximity of the spread footings.

3. The falsework system shall be designed and constructed to preclude exceeding the bearing capacity of the soil but in no case shall exceed 3,000 pounds per square foot.

4. The footings shall be designed and constructed to carry the superimposed loads.

5. All footings shall be constructed on a level plane.

C. The falsework shall be designed and constructed to support the required loading without distortion or settlement of the forms.

D. The Subcontractor shall place "tell-tales" for observation of the amount of falsework settlement at locations designated by the Purchaser.

E. The Purchaser may require the Subcontractor to submit detailed falsework plans, together with a soils report, design calculations or any other information necessary for a thorough review. The Subcontractor is totally responsible for the design and construction of the falsework system and shall repair, or remove and replace, as directed and at his expense, any concrete, other material or portions of the structure which are damaged or destroyed due to failure of the falsework.

**3.03 REINFORCEMENT**

A. All reinforcement shall consist of deformed steel bars, unless otherwise indicated or directed. Deformed steel bars shall have a net area at all sections equivalent to that of plain round or square bars of the corresponding nominal size.

B. Structural steel shapes shall conform strictly to the shapes indicated or required.

C. Steel wire fabric may be furnished in rolls or sheets.

D. Reinforcing steel shall be stored above the ground surface upon platforms, skids or other supports located without the scope of the active construction operations and shall be protected at all times from injury and damage. All brush and weeds shall be removed from the area immediately prior to storing reinforcing steel thereon.

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E. Reinforcing steel, where indicated, shall be accurately bent, without heating, to the forms and dimensions indicated on the Plans. Minimum bend diameters shall be in accordance with the requirements of the American Concrete Institute. Unless otherwise indicated, all bends shall be in one plane. Bars of 3/4 inch or less which have only hooks or a single bend may be bent in the field, provided satisfactory equipment for proper and accurate work is used and provided the bending is accomplished true to form and dimensions without damage to the bars. All other bending shall be done in the shop before shipment.

F. Substitution of bars of different sizes from those indicated on the Plans may only be made with the written permission of the Purchaser. If substitution is permitted, the following shall apply:

1. The total area of steel in any one linear foot in each direction shall not be reduced.
2. For cast-in-place concrete the clear distance between parallel bars in a layer shall not be less than 1.5 bar diameters, 1.5 times the maximum size of the coarse aggregate, nor 1-1/2 inches.
3. Where positive or negative reinforcement is placed in two or more layers, bars in the upper layers shall be placed directly above those in the bottom layer with the clear distance between layers not less than 1 inch.
4. Clear distance limitation between bars shall also apply to the clear distance between a contact lap splice and adjacent splices or bars.
5. Groups of parallel reinforcing bars bundled in contact to act as a unit shall be limited to 4 in any one bundle. Bars larger than #11 shall be limited to two in any one bundle in beams. Bundled bars shall be located within stirrups or ties. Individual bars in a bundle cut off within the span of a member shall terminate at different points with at least 40 bar diameters stagger. Where spacing limitations are based on bar diameter, a unit of bundled bars shall be treated as a single bar of a diameter derived from the equivalent total area.
6. In walls and slabs, the primary flexural reinforcement shall be spaced not farther apart than 1.5 times the wall or slab thickness, nor 18 inches.

G. All reinforcement shall be furnished in the full lengths shown on the Plans, unless otherwise approved in writing by the Purchaser. No splices shall be made unless indicated on the Plans or authorized by the Purchaser. Splices shall be so arranged and manipulated as to provide a minimum of 2 inches net clearance between the splices and the surface of the complete concrete work, unless otherwise indicated or directed. Splices of tension reinforcement at points of maximum stress shall be avoided. The members at all splices shall be rigidly clamped by means of at least two approved metal clips located approximately 3 inches from the ends of the bars and bolted around them or securely wired in a manner satisfactory to the Purchaser.

H. Steel shapes shall be spliced only as indicated on the Plans.

I. Steel fabric shall be spliced by overlapping of the sheets by not less than 12 inches; by matching at least three transverse member; and by securely wiring the overlapped sections in a manner satisfactory to the Purchaser.

J. All reinforcing steel before being placed shall be thoroughly cleaned of mill scale, rust, dirt, paint, oil, or other foreign substances or coating of any character that will reduce the bond. If reinforcement which has been placed becomes dirty, rusty, or spattered with mortar which dries before concrete is placed around it, such reinforcement, or part affected, shall be thoroughly cleaned before being covered with concrete.

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K. Reinforcement shall be accurately placed and firmly held in position as indicated on the Plans. Steel bars shall be securely fastened together with metal clips or wire at each intersection, except where spacing is less than on 1 foot in each direction then alternate intersections shall be fastened. All reinforcing steel shall be securely spaced from the forms and between adjacent reinforcement by means of precast mortar blocks, metal spacers or other approved devices or methods, and where possible, all spacer devices shall be so arranged that their use cannot be detected in the completed structure. Spacer blocks shall be cast of mortar mixed in the same proportions as that in the concrete mixture and shall not have a length or width greater than the depth required for proper spacing from the forms or between adjacent reinforcement. The use of gravel, concrete, brick, or wooden blocks is prohibited.

L. All the reinforcing steel necessary for a section of a concrete structure shall be accurately and securely placed and the placement approved by the Purchaser before any concrete is deposited in the section, and care shall be observed not to disturb it during the placing of the concrete.

M. All dimensions relating to reinforcing bars are to the centers of the bars, unless otherwise indicated.

N. Tolerances for bending and cutting during fabrication shall be in accordance with the "Manual of Standard Practice" published by the Concrete Reinforcing Steel Institute.

#### **3.04 DRAINAGE AND WEEP HOLES**

Drainage openings and weep holes shall be constructed using materials in the manner and at the locations shown on the Plans or established by the Purchaser. Ports or vents for equalizing hydrostatic pressure, when required, shall be placed as directed.

#### **3.05 PLACING PIPES, CONDUITS, ANCHORS, CASTING, AND OTHER APPURTENANCES**

A. Pipes, conduits, anchors, castings, bolts, plates, grillage, and other appurtenances which are necessary or desirable to be placed in the concrete of a structure, whether indicated on the Plans or not, shall be placed by the Subcontractor during construction, as directed.

B. No compensation will be allowed for placing such pipes, conduits, and other appurtenances, except that no deductions will be made for the volume of concrete displaced by those items.

#### **3.06 EXPANSION JOINTS**

A. Expansion devices shall be as indicated on the Plans. The devices shall be securely anchored in correct position. All sliding surfaces shall be true and smooth and shall form complete contact throughout. Movement shall not be impeded by the concrete in which they are embedded.

B. Unless otherwise provided, where portions of concrete bridge superstructure rest on the substructure, the contact area shall be separated by at least two layers of three-ply bituminous-saturated paper.

C. Open joints shall be constructed using forms which will permit removal without injury to the concrete. After removal of the forms, the joints shall be cleaned thoroughly. Filled joints shall be constructed with premolded filler, unless otherwise indicated. Joints requiring a sealant shall be thoroughly cleaned and sealed with one of the specified joint sealing materials before the structure is opened to traffic. Edges of open and filled joints shall be chamfered or edged, as directed. Mortised joints shall be constructed as shown on the Plans or as directed.

#### **3.07 PLACING CONCRETE**

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#### A. General

1. Concrete shall not be placed until forms and reinforcing steel have been checked and approved. The forms shall be clean of all debris and kept wet immediately before concrete is placed. The method and sequence of placing concrete shall be approved by the Purchaser. Unless otherwise permitted, all concrete shall be placed in daylight, and the placing of concrete in any portion of the structure shall not be started unless it can be entirely completed in daylight. When the placing of concrete is permitted during other than daylight hours, an adequate and approved artificial lighting system shall be provided and operated.
2. All concrete shall be thoroughly worked during the placing by means of tools of approved type. The working shall be such as to force all coarse aggregate from the surface and to bring mortar against the forms to produce a smooth finish, substantially free from water and air pockets or honeycomb.
3. If the forms show bulging or settlement while concrete is being placed, the placing shall be stopped until correction has been made.
4. T-beam girders, slabs, arch rings, and all horizontal sections of bridges except curbs and sidewalks shall be constructed monolithically and continuously, unless otherwise permitted. Curbs and sidewalks shall be constructed after the bridge deck is completed, unless otherwise indicated on the Plans.
5. After initial set and prior to final set of the concrete, the forms shall not be jarred, and no strain shall be placed on the ends of the projecting reinforcement. Piles shall not be driven closer than 20 feet to footings less than 7 days old nor to foundations supporting concrete less than 7 days old.

#### B. Railings and Curbing.

1. When constructing curb, careful attention shall be given to the installation of railing steel or anchoring devices.
2. Concrete railings shall not be constructed on any structure until the falsework has been struck.

#### C. Chutes and Troughs

1. Concrete shall be placed so as to avoid segregation of the materials and the displacement of the reinforcement.
2. All chutes, troughs, and pipes shall be kept clean and free from coatings of hardened concrete by thoroughly flushing with water after each run. The water used for flushing shall be discharged clear of the concrete already in place.
3. Care shall be taken to fill each part of the form by depositing the concrete as near final position as possible. The coarse aggregate shall be worked back from the forms and around the reinforcement without displacing the bars. After initial set of the concrete, the forms shall not be jarred and no strain shall be placed on the ends of projecting reinforcement.

#### D. Vibrating

1. Unless otherwise directed, the concrete shall be compacted with suitable mechanical vibrators operating within the concrete. When required, vibrating shall be supplemented by hand spading with suitable tools to assure proper and adequate compaction.

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2. Vibrators shall be so manipulated as to work the concrete thoroughly around the reinforcement and embedded fixtures and into corners and angles of the forms. Vibrators shall not be used as a means to cause concrete to flow or run into position in lieu of placing. The vibration at any point shall be of sufficient duration to accomplish compaction but shall not be prolonged to the point where segregation occurs.

3. At least one additional standby vibrating unit shall be available for all individual pours in excess of 10 cubic yards.

#### E. Joints

1. Feather-edge construction joints will not be permitted. Transverse or longitudinal joints through spans will not be permitted, except where specified.

2. In no case shall the concreting of any section or layer be stopped or temporarily discontinued within 18 inches of any finished surface, unless the details of the structure provide for a coping having a thickness of less than 18 inches, in which case, at the option of the Purchaser, the construction joint may be made at the underside of the coping.

3. Layers completing a day's work or placed just prior to temporarily discontinuing operations shall be cleaned of all laitance or other objectionable material as soon as the surface has become sufficiently firm to retain its form.

#### 3.08. BONDING CONSTRUCTION JOINTS

A. Where dowels, reinforcing bars, or other adequate ties are not indicated on the Plans, keys of a directed size shall be made by constructing projections above the concrete and monolithically with the concrete.

B. In resuming work, the forms shall be drawn tightly against the face of the concrete. The entire surface of the concrete to be bonded shall be cleaned thoroughly and roughened with a steel tool. In addition, if directed, the surface to be bonded shall be cleaned and roughened by sandblasting. The surface shall then be soaked with clean water, after which concreting may proceed.

#### 3.09. REMOVAL OF FORMS AND FALSEWORK.

A. Forms for ornamental work, railings, parapets, columns, and vertical surfaces that do not carry loads shall be removed in from 12 to 48 hours, unless otherwise directed by the Purchaser. In cold, damp, or freezing weather, all vertical forms shall remain in place until the concrete has set sufficiently to withstand damage when the forms are removed. In removing forms, care shall be exercised not to mar the surface of the concrete nor to subject it to any undue pressure.

B. Projecting wires or other metal devices used for holding forms in place and which pass through the body of the concrete shall be removed or cut as specified in Specification Section 03310 Paragraph 3.01.A, and the holes or depressions thus made and all other holes, depressions, and small voids which show upon the removal of the forms shall be filled with cement mortar mixed in the same proportions as that which was used in the body of the concrete which is being repaired.

C. Falsework and supports under slab or girder spans, any length, may be released and removed when representative specimens of the concrete in the spans, cured by the methods and in the manner the concrete which the test specimens represent is cured, attain a compressive strength of 3,000 pounds per square inch. In addition to the above requirement, the concrete

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shall have been placed a minimum of 10 days, not counting the days of 24 hours each in which the temperature falls below 40° F., or 21 calendar days, whichever occurs first.

D. For continuous concrete girder or slab units, any length, the falsework and supports shall not be released or removed from any span in the continuous unit until the concrete in all spans in the unit has been placed a sufficient length of time to meet all requirements for the removal of falsework and supports as set forth above.

E. Forms supporting bridge decks between girders and outside curb overhangs may be removed after seven days.

#### 3.10. DEFECTIVE CONCRETE

A. Any defective concrete discovered after the forms have been removed shall be removed immediately and replaced. If the surface of the concrete is bulged, uneven, or shows honeycombing which cannot be repaired satisfactorily, the entire section shall be removed and replaced.

B. Concrete having a 28 day strength of less than the minimum specified shall be removed and disposed of by the Subcontractor, at his expense, unless specifically authorized by the Purchaser, in writing, to remain in place. The removal shall be in such a manner as will not cause damage to the remaining concrete or to other structural units or other facilities and property.

#### 3.11. FINISHING CONCRETE SURFACES

A. Unless otherwise authorized, the surface of the concrete shall be finished immediately after form removal.

B. All concrete surfaces shall be given a Class 1 finish. The following surfaces of all structures shall be given a Class 2 Finish: roadway face and top of curb, vertical outside face of curb overhang or sidewalk slab, bottom surface of slab overhang, bridge railings, barrier railings, all vertical surfaces of the superstructure of dual bridges exposed to view from either structure, and all surfaces of retaining walls, wingwalls, and end walls which are visible from passing vehicles.

##### 1. Class 1, Ordinary Surface Finish.

a. Immediately following the removal of the forms, all fins and irregular projections shall be removed from all surfaces which are to be exposed or waterproofed. On all surfaces, the cavities produced by form ties and all other holes, honeycomb spots, broken corners or edges, and other defects, shall be thoroughly cleaned, saturated with water, and carefully pointed and trued with a mortar of cement and fine aggregate mixed in the proportions used in the Class of the concrete being finished. Mortar used in pointing shall not be more than 30 minutes old. All construction and expansion joints in the completed work shall be left carefully tooled and free of all mortar and concrete. The joint filler shall be left exposed for its full length with clean and true edges.

b. All surfaces which cannot be repaired to the satisfaction of the Purchaser shall be "rubbed" as specified for a Class 2 finish.

##### 2. Class 2, Rubbed Finish.

a. After removal of forms, the rubbing of concrete shall be started as soon as its condition will permit. Immediately before starting this work, the concrete shall be kept thoroughly saturated with water. Sufficient time shall have elapsed before the wetting down to allow the mortar used in the pointing to thoroughly set. Surfaces to be finished shall be rubbed with a wetted wooden block or a medium coarse carborundum stone.

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The carborundum stone shall not be used until the concrete has hardened to the state where the sand will grind, rather than ravel or roll. Rubbing shall be continued until all form marks, projections, and irregularities have been removed; all voids filled; and a uniform surface has been obtained. The paste produced by this rubbing shall be left in place. A brush finish or painting with grout will not be permitted.

b. After all concrete above the surface being finished has been cast, the final finish shall be obtained by rubbing with a fine carborundum stone and water. This rubbing shall be continued until the entire surface is of a smooth texture and uniform color.

c. After the final rubbing is completed and the surface has dried, it shall be rubbed with burlap to remove loose powder and shall be left free from all unsound patches, paste, powder, and objectionable marks.

3. Class 3, Float Finish

a. This finish, for unformed surfaces, except slab surfaces for pavements or bases, shall be achieved by placing an excess of material in the form and removing or striking off the excess with a template, forcing the coarse aggregate below the mortar surface. Creation of concave surfaces shall be avoided after the concrete has been struck off, the surface shall be thoroughly worked and floated with a suitable floating tool of wood, canvas, or cork. Before the finish has set, the surface cement film shall be removed with a fine brush in order to have a fine-grained, smooth but sanded texture.

3.12. FINISHING SLAB SURFACES FOR PAVEMENTS OR BASES.

A. Bridge floors or top slabs of structures serving as finished pavements or bases shall be finished either by hand methods or approved mechanical finishing machines.

B. When the hand method is used, the bridge floors or slabs shall be struck off with a screed which is parallel to the centerline of the roadway, resting on bulkheads or screed strips cut or set to the required cross-section of the roadway. This screed shall be so constructed as to have sufficient strength to retain its shape and that the cutting edge may be adjusted to conform to the profile of the roadway. Screeds shall be of sufficient length to finish the full length of spans 40 feet or less in length. Spans over 40 feet in length shall be finished in two or more sections, but no section shall be less than 20 feet in length. Screed strips or headers shall be accurately set to the specified grades, checked, and adjusted as necessary prior to the final screeding operation. The screed shall be worked back and forth over the surface until the proper profile and cross-section is obtained.

C. When mechanical finishing machines are used, they shall be approved power driven machines, traveling on rails adjusted to conform to the profile of the roadway. The machines shall be equipped with oscillating or vibrating transverse or longitudinal screeds that may be adjusted to conform to the profile or the required cross-section of the roadway. The screeds shall have sufficient strength to retain their shape after adjustment. The finishing machine shall go over each area of the bridge floor as many times as is required to obtain the required profile and cross-section.

D. Regardless of the method of finishing, the Subcontractor shall maintain a minimum rate of placement of 20 linear feet of bridge deck per hour when concrete is placed in a longitudinal section.

E. After finishing as described above, the surface shall be checked with a 12 foot straightedge and shall show no deviation in excess of 1/8 inch from the testing edge of the straightedge when placed parallel to the centerline. Deviations in excess of this requirement shall be corrected before the concrete sets.

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F. The surface shall be finished by dragging a seamless strip of damp burlap over the full width of the surface. The burlap drag shall consist of sufficient layers of burlap to slightly groove the surface and shall be moved forward with minimum bow of the lead edge. The drag shall be kept damp, clean, and free of particles of hardened concrete. A light broom or brush herring bone finish that leaves a texture similar to that obtained by the burlap drag may be used when permitted by the Purchaser. For bases, the surface shall be finished by grooving lightly with a wire broom at an angle of 60° with the centerline. All strokes shall begin at the center and end at the edge. After the slab has been finished by the burlap drag, surfaces which will become traffic lanes shall be textured by the formation of transverse grooves. The grooves shall be formed in the surface at an appropriate time during the stiffening of the concrete, so that in the hardened concrete the grooves will be between 0.09 inch and 0.13 inch in width; between 0.12 inch to 0.19 inch in depth; and spaced at random intervals between 0.3 inch and 1.0 inch. The grooves shall terminate approximately 18 inches from curbs, parapets, barrier walls, and other vertical walls. The grooves shall be relatively smooth and uniform; shall be formed without tearing the surface and without bringing pieces of coarse aggregate to the top of the surface; and shall be formed to drain transversely. All areas which do not conform to these requirements shall be corrected at the Subcontractor's expense by approved methods.

G. As soon as the surface has set sufficiently to withstand damage when walking on it and not later than the morning following the placing of the concrete, it shall be straightedged with the 12 foot straightedge and all variations exceeding 1/8 inch shall be plainly marked. The Subcontractor shall correct any such variations in the same manner as specified for Portland Cement Concrete Pavement.

**3.13. CURING CONCRETE**

A. All concrete surfaces, except those surfaces protected by forms that remain in place seven days or longer as required under the provisions of Specification Section 03310 Paragraph 3.09, "Removal of Forms and Falsework", shall be cured as specified below. Curing shall begin as soon as the concrete has hardened sufficiently to withstand surface damage to unformed surfaces and immediately after the forms have been removed from formed surfaces.

B. When the temperature is expected to fall below 35° F., the concrete shall be protected in accordance with the provisions of Specification Section 03310 Paragraph 3.14.

C. The initial curing period for concrete surfaces shall be by the "Water Method" for a period of not less than 24 hours, or until the concrete surfaces have been prepared for the application of curing compound, in accordance with the provisions under B below. During the initial curing period, the concrete shall be protected from the sun by burlap mats or other approved materials and kept completely and continuously moist.

D. The "Water Method" and membrane-forming compound method of curing will be required for all bridge decks, and on all concrete slabs when the temperature exceeds 90° F. during placement.

**1. Water Method**

a. All concrete slabs shall be covered immediately with material suitable for use with the water cure and kept thoroughly wet for at least 120 hours from the beginning of the initial curing period. All surfaces other than slabs shall be protected from the sun and shall be kept wet for a period of at least 72 hours from the beginning of the initial curing period. Curbs, walls, handrails, and other surfaces requiring a Class 2 finish may have the covering temporarily removed for finishing, but the covering shall be restored as soon as possible.



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#### 2. Membrane-Forming Compound Method

a. All surfaces shall be given the required surface finish prior to application of the curing compound. Prior to the application of curing compound, the surface shall be kept moist.

b. The rate of application of curing compound shall be as recommended by the manufacturer but shall not be less than one gallon for 150 square feet of concrete surface. The curing compound shall be applied, under pressure, immediately after completion of the initial curing period or acceptance of the concrete finish. If the surface is dry, the concrete shall be thoroughly wet with water and the curing compound applied just as the surface film of water disappears. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. If the application of the compound results in a streaked or blotchy appearance, the method shall be stopped and water curing, as set out above, applied until the cause of the defective appearance is corrected. The coating shall be protected against marring for a period of seven days from date of application. Any coating marred or otherwise disturbed within the seven day period shall be replaced at once.

#### 3.14 PROTECTION OF CONCRETE IN COLD WEATHER

Concrete shall be protected in cold weather as specified in Specification Section 03050.

#### 3.15 WATERPROOFING AND WATERSTOPS

A. Waterproofing shall be applied as indicated in the Division 2 Specifications.

B. Metallic or nonmetallic waterstops, as specified, shall be installed in accordance with the details shown on the Plans and in conformity with the requirements of these Specifications.

C. Metallic waterstops shall be spliced, welded or soldered, as necessary, to form continuous, watertight joints.

D. Nonmetallic waterstops shall be installed in continuous strips without splices, except that splices will be permitted at changes in direction when necessary to avoid buckling or distortion of the web or flange. All splices of nonmetallic waterstops shall be performed in accordance with the manufacturer's recommendations and in the case of polyvinylchloride waterstops, the heat used shall be sufficient to melt but not char the plastic.

E. Adequate provisions shall be made to support the waterstops during the progress of work and to insure their proper embedment in the concrete. The concrete shall be thoroughly worked in the vicinity of the joints to insure maximum density and imperviousness. Forms shall be so designed that they can be removed without damaging the waterstops. Suitable guards shall be provided to protect exposed projecting edges and ends of partially embedded waterstops from mechanical damage.

### **PART 4 – MEASUREMENT**

#### 4.01 MEASUREMENT

A. All concrete will be measured for payment as stipulated under the Specification Section specifying each individual type of construction.

B. No allowance will be made for furnishing the material and the construction of drainage openings and weep holes as indicated or as directed, provided such openings are 6 inches in diameter or less, except that no deduction will be made for such openings in the computation of concrete quantities. Allowance will be made for other openings as indicated.

**CITY OF MEMPHIS - STANDARD CONSTRUCTION SPECIFICATIONS**

**Modified by SARP10 Program**

**SECTION 03310 CONCRETE STRUCTURES**

C. No allowance will be made for additional cement used in depositing concrete underwater; for use of calcium chloride or chemical additives; for fillers, sealer, and tar paper used in expansion joints; for dowels or other materials used in bonding construction joints; for waterstops; and for painting metals.

D. No allowance will be made for concrete placed below the foundation elevation shown on the Plans or as directed by the Purchaser.

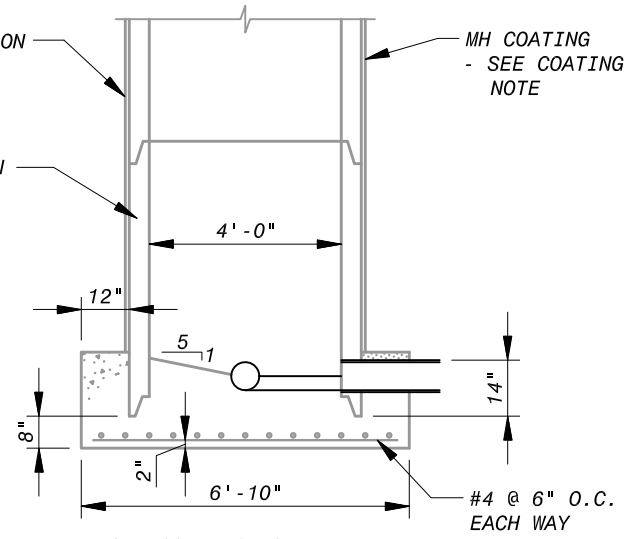
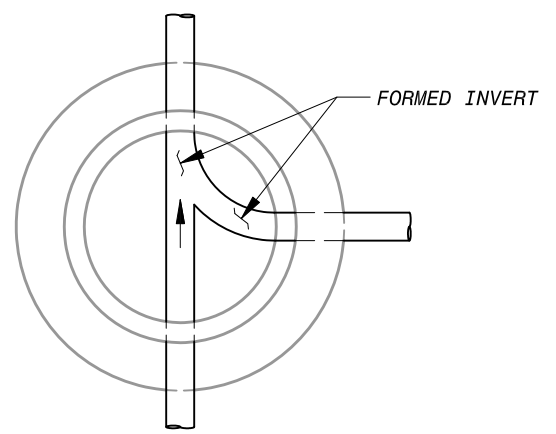
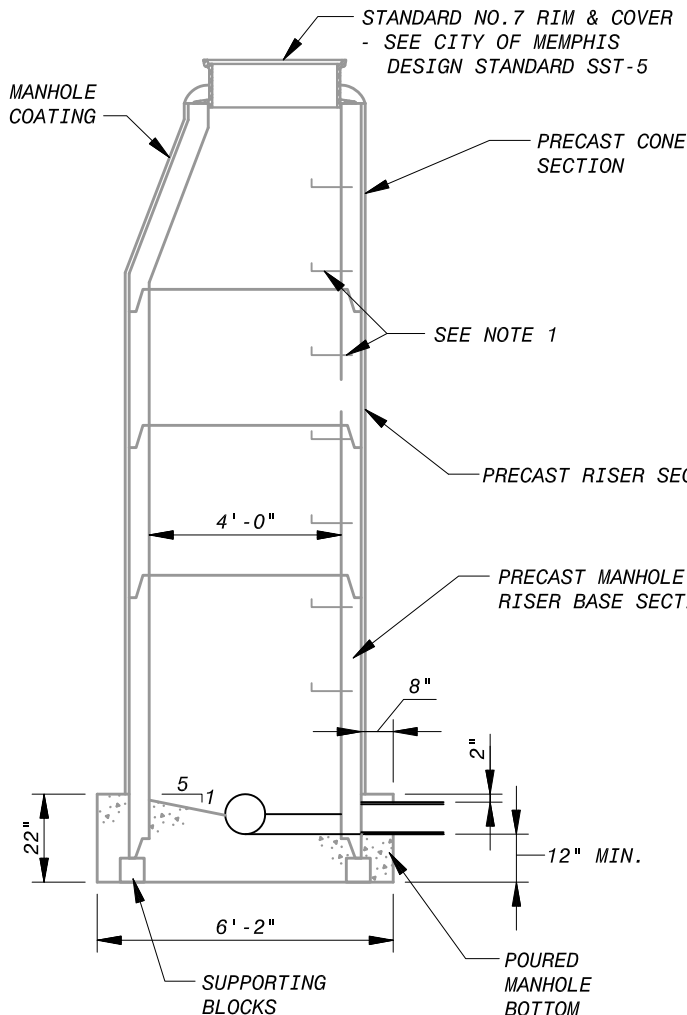
E. No additional compensation will be made for high-early-strength concrete substituted by the Subcontractor.

**PART 5 – PAYMENT**

5.01 PAYMENT

All concrete will be paid for as stipulated under the Specification Section specifying each individual type of construction.

**END OF SECTION 03310**



**MANHOLE COATING NOTE:**  
 OUTSIDE COATING OF MANHOLE SHALL BE WITH ASPHALTIC BLACK, AS AVAILABLE AT UNITED PAINT COMPANY.



METHOD OF APPLICATION SHALL BE PERFORMED BY BRUSH OR BY LOW PRESSURE SPAYER.

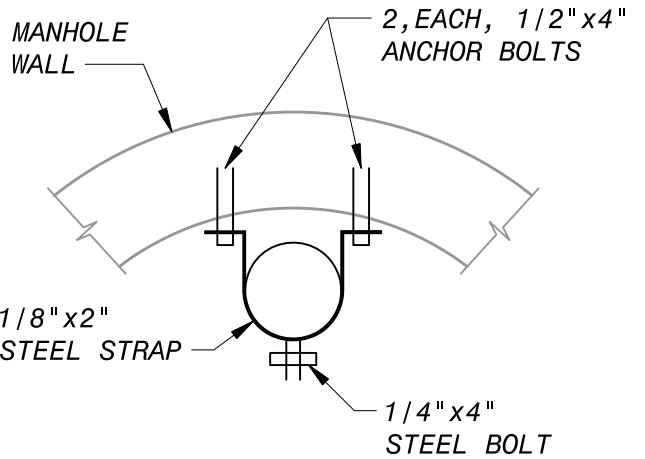
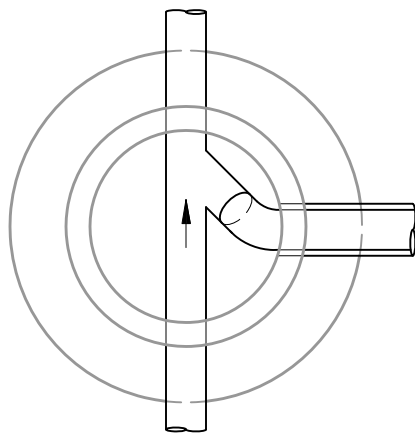
- NOTES:**
- CAST IRON STEPS STAGGERED LATERALLY 12" C-C & UNIFORMLY SPACED VERTICALLY AT 16" O.C. MAXIMUM - SEE "MANHOLE STEPS" NOTE BELOW

## TYPICAL PRECAST MANHOLE

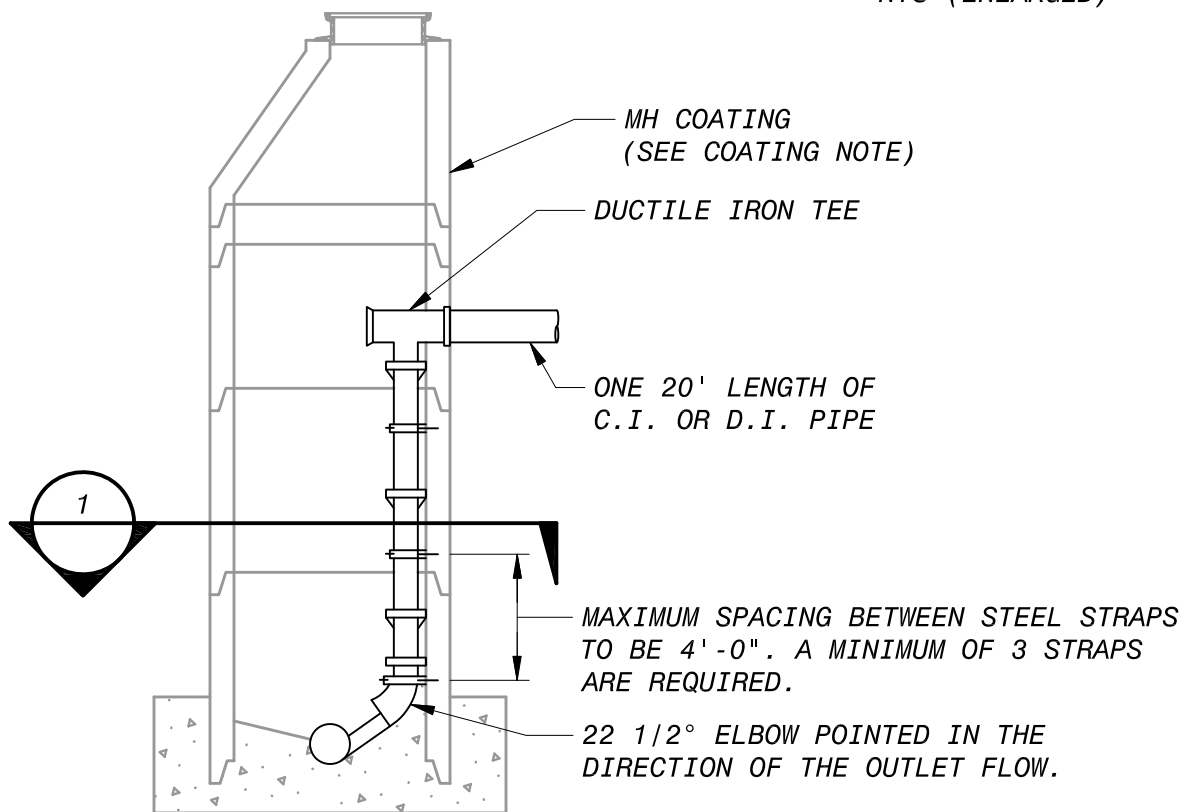
## ALTERNATE (MANHOLES IN EXCESS OF 20' DEEP)

- JOINT SEALANT:** CONCRETE MORTAR SHALL BE USED TO SEAL JOINTS AFTER THE INSTALLATION OF AN APPROVED GASKET MATERIAL BETWEEN ALL PRECAST MANHOLE SECTIONS.
- BASE SECTIONS:** MANHOLE BOTTOM SHALL NOT BE POURED UNTIL PRECAST BASE SECTION OF MANHOLE AND PIPE STUBS OUT & IN ARE IN PLACE. PIPE STUBS OUTSIDE OF MANHOLE SHALL HAVE A MINIMUM LENGTH OF 12" AND A MAXIMUM LENGTH OF 15" FROM OUTSIDE OF MANHOLE TO THE FIRST JOINT OF PIPE. CONCRETE USED TO FORM BASES AND INVERTS SHALL BE 3,000 p.s.i.
- SUBSTITUTES:** POURED-IN-PLACE MANHOLES MAY BE SUBSTITUTED FOR PRECAST MANHOLES, PROVIDED A FORMAL, WRITTEN REQUEST HAS BEEN SUBMITTED TO & APPROVED BY THE ENGINEER OF DESIGN. ALL POURED-IN-PLACE MANHOLES SHALL CONFORM TO CITY OF MEMPHIS STANDARD DRAWINGS NO. SST-6 AND SST-7.
- MANHOLE STEPS:** THE FOLLOWING MANHOLE STEPS HAVE BEEN APPROVED FOR USE:
- TOWER GROVE MH STEP NO. B-1096 BY TOWER GROVE FOUNDRY CO.
  - M.A. MANHOLE STEPS BY M.A. INDUSTRIES, INC., EAST POINT, GA.
  - WEDGE-LOK SAFETY STEP BY DELTA PIPE PRODUCTS, INC., ATLANTA, GA.

	<h1 style="margin: 0;">SARP10</h1> <h2 style="margin: 0;">PRECAST SANITARY MANHOLE SST-1</h2>
	<p>REV 0.0</p> <p>DATE: 06/04/15</p>



**SECTION**  
NTS (ENLARGED)



**INSIDE DROP**  
(SEE NOTE 2)

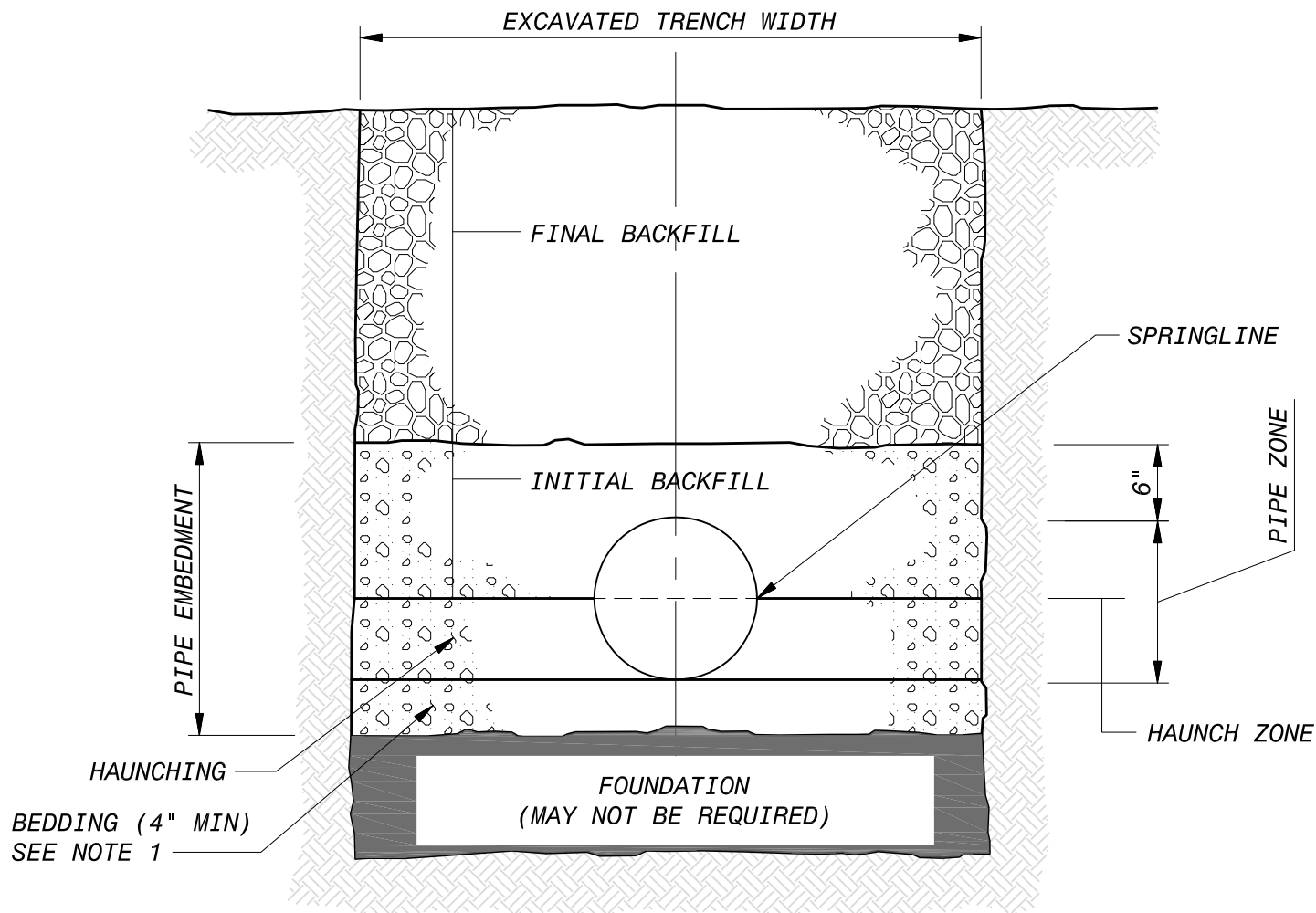
- NOTES:**
1. TO BE USED, WHERE REQUIRED, ON NEW MANHOLES.
  2. TO BE USED ON ALL EXISTING MH'S, WHERE REQUIRED.

\* OPENING IN MH WALL TO BE GROUTED WITH HIGH STRENGTH, QUICK SETTING, NON-SHRINKING CEMENT GROUT.



**SARP10**

**SANITARY MANHOLE DROP CONSTRUCTION SST-2**



**FIGURE 1**

TRENCH CROSS SECTION SHOWING TERMINOLOGY

**NOTES**

1. INSTALL CRUSHED LIMESTONE ASTM D-448-54 TABLE 1, #67 FOR BEDDING AND HAUNCHING MATERIAL. THE QUANTITY OF CRUSHED LIMESTONE FOR BEDDING AND HAUNCHING IS PART OF THE "SEWER POINT REPAIR" LINE ITEM AND NO SEPARATE PAYMENT WILL BE MADE.
2. INSTALL EITHER CRUSHED LIMESTONE OR RECYCLED CRUSHED CONCRETE FOR INITIAL BACKFILL AND FINAL BACKFILL PER CITY OF MEMPHIS SPECIFICATIONS.



**SARP10**

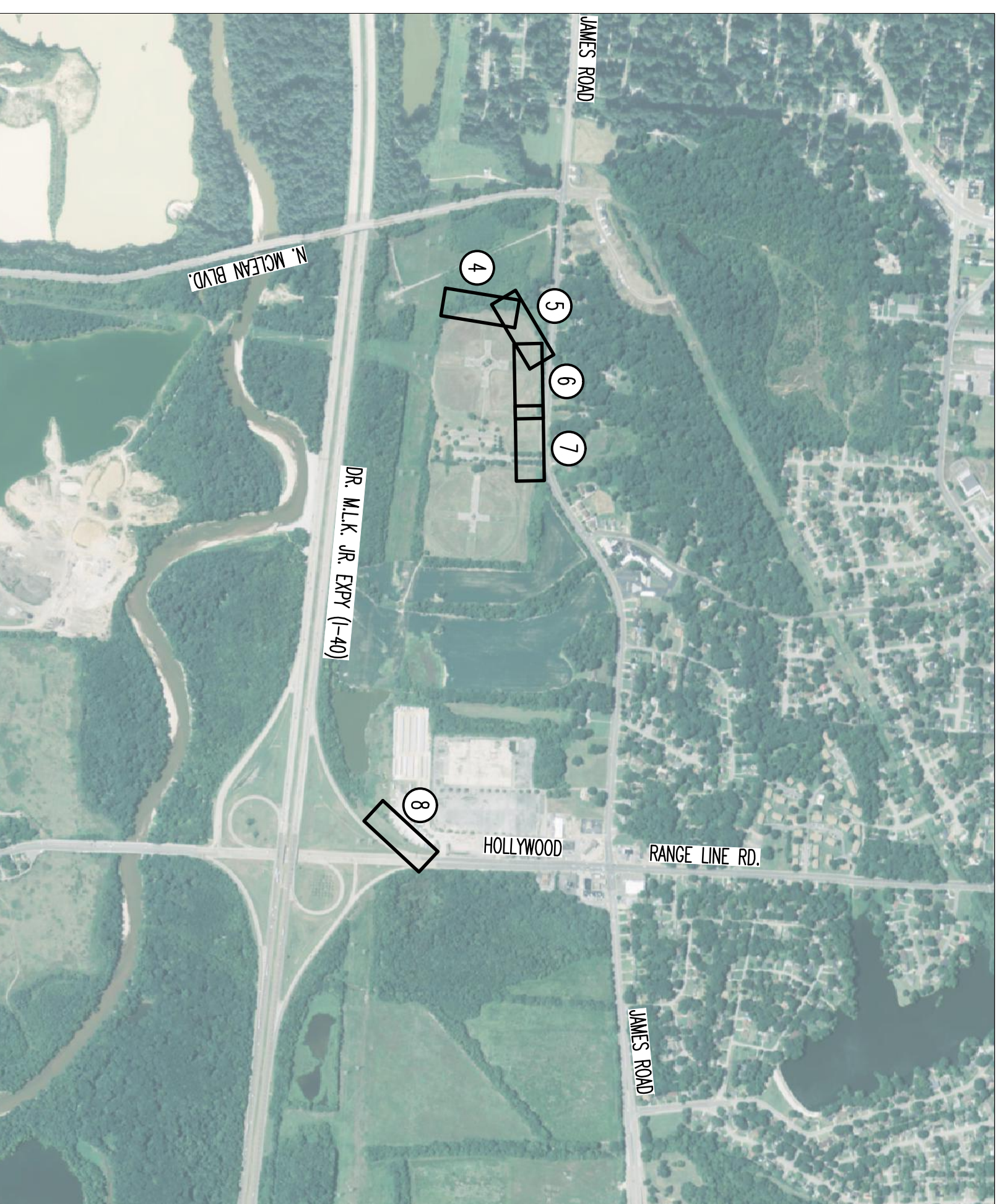
TRENCH CROSS SECTION  
SHOWING TERMINOLOGY



# CITY OF MEMPHIS SHELBY COUNTY, TENNESSEE

## RODNEY BABER PARK SEWER IMPROVEMENTS

APRIL 2016



LOCATION MAP.  
SCALE: 1"=1000'

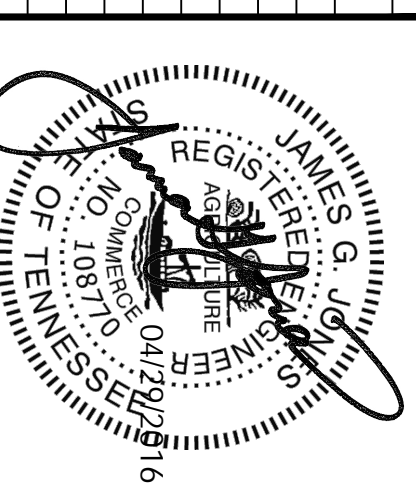
### DRAWING INDEX

- C01. RODNEY BABER PARK SEWER IMPROVEMENTS - COVER SHEET
- C02. RODNEY BABER PARK SEWER IMPROVEMENTS - GENERAL NOTES AND LEGEND
- C03. RODNEY BABER PARK SEWER IMPROVEMENTS - OVERALL SITE PLAN
- C04. RODNEY BABER PARK SEWER IMPROVEMENTS - PLAN AND PROFILE
- C05. RODNEY BABER PARK SEWER IMPROVEMENTS - PLAN AND PROFILE
- C06. RODNEY BABER PARK SEWER IMPROVEMENTS - PLAN AND PROFILE
- C07. RODNEY BABER PARK SEWER IMPROVEMENTS - PLAN AND PROFILE
- C08. RODNEY BABER PARK SEWER IMPROVEMENTS - PLAN AND PROFILE
- C09. RODNEY BABER PARK SEWER IMPROVEMENTS - TYPICAL DETAILS
- C10. RODNEY BABER PARK SEWER IMPROVEMENTS - TYPICAL DETAILS
- C11. RODNEY BABER PARK SEWER IMPROVEMENTS - TYPICAL DETAILS



TITLE NO.	REVISION	DESCRIPTION OF CHANGE	APPROVAL DATE

DIVISION OF ENGINEERING  
**RODNEY BABER PARK SEWER IMPROVEMENTS**  
 DEVELOPER: City of Memphis  
 ENGINEER: LDA ENGINEERING



DIVISION OF ENGINEERING  
**SARP10**  
**RODNEY BABER PARK COVER SHEET**  
 LOCATION: RODNEY BABER PARK  
 MEMPHIS, TENNESSEE

SURVEY BY: LDA ENGR. DATE: 4/28/2016 BOOK: AS SHOWN  
 DESIGN BY: LDA ENGR. DATE: 4/28/2016 SCALE: AS SHOWN  
 REVIEWED: DATE: CITY ENGINEER  
 DEPUTY CITY ENGINEER DATE: CITY ENGINEER DATE:

**C01**



**GENERAL SANITARY SEWER NOTES:**

1. ALL SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS OF THE CITY OF MEMPHIS, SARP TO PROGRAM.
2. THE CONTRACTOR IS TO BE RESPONSIBLE FOR INFORMING THE CITY OF MEMPHIS 2 WEEKS BEFORE THE START OF CONSTRUCTION, CONFORMING TO THE REQUIREMENTS OF THE INSPECTOR DURING CONSTRUCTION AND TO REQUEST THE FINAL INSPECTION FOR APPROVAL BY THE CITY OF MEMPHIS.
3. CONNECTIONS TO EXISTING FACILITIES SHALL BE MADE ONLY UNDER THE SUPERVISION OF A REPRESENTATIVE OF THE CITY OF MEMPHIS.
4. BACKFILL FOR SEWER LINES UNDER STREETS AND DRIVEWAYS IS TO BE COMPACTED ORIGINATED STONE (SEEING CITY OF MEMPHIS STANDARDS).
5. AS-BUILT PLANS MUST BE COMPLETED AND SUBMITTED PRIOR TO ACCEPTANCE OF SEWER LINES BY THE CITY OF MEMPHIS.
6. NO OTHER UTILITIES MAY BE INSTALLED IN THE SAME TRENCH AS THE SEWER LINES OR LATERAL SERVICE LINES.
7. CONTRACTOR SHALL DETERMINE "LIVE OR ABANDONED" STATUS OF ALL EXISTING SERVICES CONNECTED TO MAIN LINE SEGMENTS AS DESIGNATED FOR REPLACEMENT PRIOR TO RE-CONNECTION. ABANDONED OR INACTIVE SERVICES ARE NOT TO BE RECONNECTED TO THE NEW LINE UNLESS DIRECTED BY THE OWNER'S REPRESENTATIVE.
8. CONTRACTOR SHALL RECONNECT TO EXISTING SEWER LINES IN CONJUNCTION WITH NEW MANHOLE INSTALLATION.
9. CONTRACTOR SHALL COVER WITH PROPERTY OWNER TO COMPLET INSTALLATION OF CONCRETE RING AROUND CLEAN OUT ASSEMBLY AND/OR STANDBY SEWER CLEANOUT COVER. BACKFILL AROUND CLEAN OUT ASSEMBLY MUST BE PLACED AND COMPACTED TO FINAL GRADE TO MATCH EXISTING PROPERTY AND ADJOINING PROPERTY.
11. CONTRACTOR SHALL ENSURE UNINTERRUPTED SEWER SERVICES ON EXISTING SEWER AND SERVICE CONNECTIONS BY PROVIDING ADEQUATE TEMPORARY WASTEWATER PUMPING AND/OR BYPASSING.
12. CONTRACTOR SHALL NOTIFY THE CITY MEMPHIS CONSTRUCTION INSPECTION OFFICE AT (901)729-2462 A MINIMUM OF 24 HOURS PRIOR TO BEGINNING ANY CONSTRUCTION.
13. THE CONTRACTOR SHALL VERIFY EXISTING DATA AND REPORT ANY SIGNIFICANT DISCREPANCIES TO THE ENGINEER.
14. ALL SANITARY SEWER TO BE CONSTRUCTED AS PER CITY OF MEMPHIS STANDARD CONSTRUCTION SPECIFICATIONS. SANITARY SEWER SERVICE CONNECTIONS TO BE INSTALLED AS PER CITY OF MEMPHIS STANDARD SST-16.
15. ALL SEWER MANHOLE LIDS IN OPEN AREAS ARE TO BE CONSTRUCTED 1.5' ABOVE PROPOSED GRADE.
16. ALL SANITARY SEWER, INCLUDING SERVICE CONNECTIONS, WHICH HAS LESS THAN 1.5' CLEARANCE (OUTSIDE OF PIPES) WITH DRIVEWAY OR IN FILL AREAS SHALL BE CLASS SO DUCT, OR CONCRETE ENCASED, 10" MINIMUM BOTH SIDES OF CROSSING. ALL DUCTILE IRON PIPE (DIP) SHALL BE POLYETHYLENE LINED OR SHALL BE TREATED WITH PROTECTO 401 OR AN APPROVED EQUIVALENT.
17. MANHOLES LOCATED WITHIN 100-YEAR FLOOD PLAN SHOULD EXTEND MINIMUM OF 12" (1'-0") ABOVE THE 100-YEAR FLOOD LEVEL REGARDLESS OF WHETHER THE MANHOLE IS IN RESIDENTIAL, COMMERCIAL, OR RURAL PROPERTY. AS AN ALTERNATE, A MANHOLE LOCATED WITHIN THE 100-YEAR FLOOD PLAN MUST HAVE A SEALED COVER AND VENT STACK IF IT EXTENDS LESS THAN THE MINIMUM 12" ABOVE THE 100-YEAR FLOOD LEVEL. WITHIN THIS ALTERNATE, THE VENT STACK COULD BE LIMITED TO EVERY OTHER MANHOLE IF LOCATED WITHIN A RESIDENTIAL AREA.
18. THIS PROPERTY IS LOCATED IN A SPECIAL FLOOD HAZARD AREA (ZONE AE) AS SHOWN ON FEMA MAP PANEL 4715702B0F, DATED 9/28/2007. BRE-2330

**CONSTRUCTION SEQUENCE NOTES:**

1. CONSTRUCTION AND IMPLEMENTATION OF EROSION AND SEDIMENT CONTROLS AS SHOWN ON THE CONSTRUCTION PLANS.
2. MODIFICATION OF EXISTING UTILITIES, IF NECESSARY.
3. EXCAVATION OF TRENCH AND PRE INSTALLATION. NO MORE THAN 500LF OF CONSTRUCTION DISTURBANCE WILL TAKE PLACE AT A TIME.
4. INSTALLATION OF PPE AND INITIAL CLEANUP, TEMPORARY STABILIZATION WITH SEEDING AND STRAW.
5. BACKFILL OF PPE AND INITIAL CLEANUP, TEMPORARY STABILIZATION WITH SEEDING AND STRAW.
6. FINAL CLEANUP.
7. FINAL STABILIZATION WITH SEEDING/STRAWING.
8. REMOVAL OF EROSION AND SEDIMENT CONTROLS.

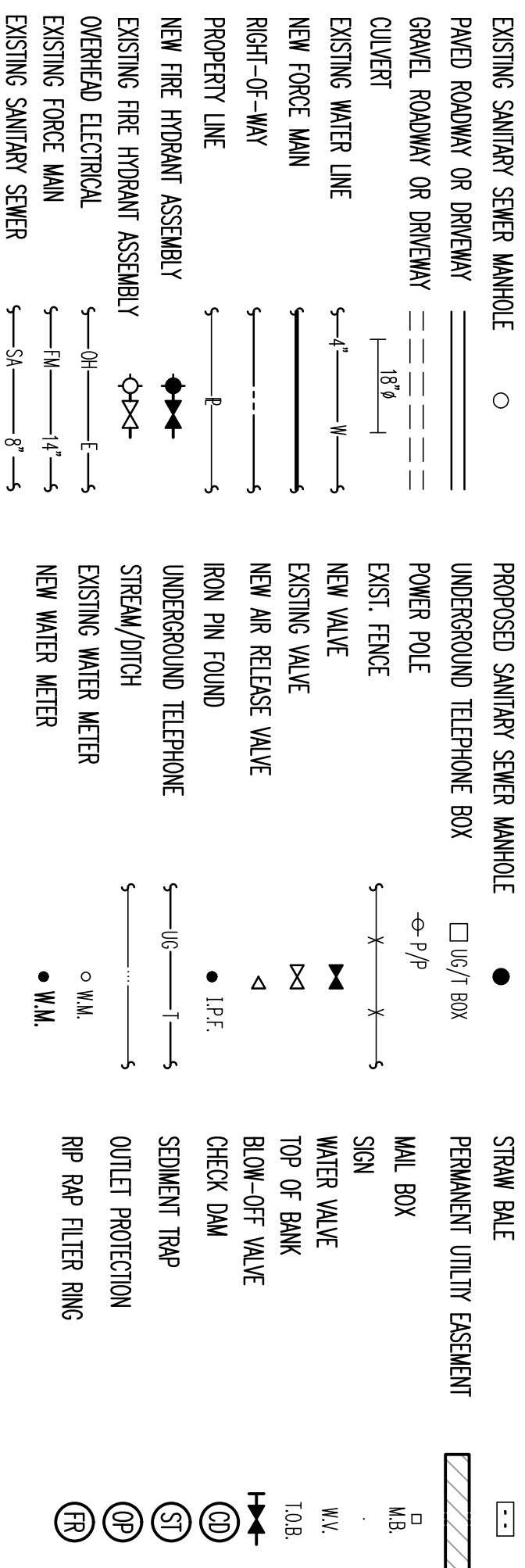
**EROSION AND SEDIMENT CONTROL NARRATIVE:**

THIS PROJECT IS A LINEAR PROJECT TOTALING 2,453 LF. OF PROPOSED SANITARY SEWER LINE. DUE TO THE LINEAR NATURE, SILT FENCE, USING TPOOT DETAIL EC-SR-38, IS PROPOSED ALONG THE LENGTH OF THE PROPOSED SEWER LINES. TOTAL DISTURBANCE WIDTH IS 20' WITH THE SILT FENCE TO BE PLACED AT A 10' OFFSET FROM THE SEWER LINE ALONG EACH SIDE. THERE ARE NO STREAMS OR OUTFALLS, AS WELL AS NO DETENTION OR STORAGE FACILITIES ON THIS PROJECT. NO MORE THAN 500 LF. SHALL BE DISTURBED AT ANY GIVEN TIME.

**GENERAL NOTES:**

1. THE CONTRACTOR SHALL CONTACT THE TENNESSEE ONE-CALL CENTER AT 811 PRIOR TO DIGGING.
2. THE CONTRACTOR SHALL MAINTAIN TRAFFIC AND PROVIDE ADVANCE WARNING SIGNS AND TEMPORARY TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE CITY OF MEMPHIS AND TDD REQUIREMENTS AND THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). THE CONTRACTOR SHALL FURNISH, INSTALL, AND MAINTAIN ADVANCE WARNING SIGNS AND TEMPORARY TRAFFIC CONTROL SIGNS AND MARKINGS AS REQUIRED BY THE MUTCD THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN IN ACCORDANCE WITH THE CITY OF MEMPHIS AND TDD REQUIREMENTS AND THE LATEST EDITION OF THE MUTCD PRIOR TO ANY CONSTRUCTION ACTIVITIES FOR OWNER APPROVAL.
3. THE CONTRACTOR SHALL MAINTAIN VEHICULAR AND PEDESTRIAN ACCESS TO RESIDENTS AND BUSINESSES THROUGHOUT CONSTRUCTION.
4. REPLACE CONCRETE AND ASPHALT DRIVEWAYS BY STRAIGHT LINEAR SAW CUT 12 INCHES OUTSIDE THE DISTURBED TRENCH AREA ON PROPERTY SIDE. REPLACE TO EDGE OF PAVEMENT OF EXISTING CITY STREET AND/OR COUNTY ROAD ON ROADWAY SIDE. SHOULD CUTS FALL WITHIN 2 FEET OF AN EXISTING JOINT, REPLACE TO JOINT.
5. EXISTING UTILITY SERVICE LINES, METERS, ETC. DAMAGED DURING CONSTRUCTION ARE TO BE REPAIRED OR REPLACED IN ACCORDANCE WITH THE GOVERNING UTILITY REQUIREMENTS.
6. THESE PLANS ARE BASED ON AN ACTUAL FIELD SURVEY AND LAYOUT OF THE SEWER SYSTEM. ANY DISCREPANCIES BETWEEN THE PLAN LOCATIONS AND THE ACTUAL FIELD LOCATIONS SHALL BE IMMEDIATELY COMMUNICATED TO THE DESIGN ENGINEER.
7. CONTRACTOR TO REMOVE EXISTING CULVERTS AND INSTALL NEW CULVERTS UNDER DRIVEWAYS AS REQUIRED FOR NEW SEWER LINE INSTALLATION. CULVERT REPLACEMENT COST TO BE INCLUDED IN UNIT PRICE OF NEW SEWER LINE.
8. ALL DUCTILE IRON PIPE SHALL BE INSTALLED WITH RESTRAINED JOINTS (PRESSURE PIPE ONLY) AND SHALL BE LINED (INTERIOR) WITH PROTECTO 401.
9. WATER LINES AND OTHER UTILITIES SHOWN FOR INFORMATIONAL PURPOSES. VERIFY LOCATION PRIOR TO CONSTRUCTION TO PREVENT DAMAGE TO EXISTING UTILITIES.
10. REPLACEMENT OF CONCRETE DITCHES SHALL BE IN ACCORDANCE WITH TDD STANDARD SPECIFICATIONS FOR ROAD AND BROOK CONSTRUCTION.
11. EXISTING PIPE SIZES, MATERIALS, MANHOLE DEPTHS, AND LATERAL LOCATIONS TAKEN FROM THE CITY OF MEMPHIS DRAWINGS AND FIELD INFORMATION.
12. CONTRACTOR TO VERIFY MANHOLE ANGLES, PIPE TYPES AND SIZES, AND INVERT ELEVATIONS PRIOR TO ORDERING NEW PRECAST MANHOLES.
13. CONTRACTOR SHALL FIELD VERIFY LOCATION OF ALL SEWER LATERALS AND CONNECT TO NEW SEWER LINE AS NECESSARY.
14. CONTRACTOR WILL BE REQUIRED TO OBTAIN A BUSINESS LICENSE FROM THE CITY OF MEMPHIS PRIOR TO CONSTRUCTION.
15. CONTACT MICHELLE PARRIN AT 423-986-4610.
15. LOCATION OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND NOT NECESSARILY ALL OF SAME. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE APPROPRIATE UTILITY COMPANY TO DETERMINE THE EXACT LOCATION OF ALL UTILITIES AND/OR UNDERGROUND STRUCTURES PRIOR TO THE INITIATION OF ANY CONSTRUCTION. CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR DAMAGE TO ANY UTILITIES ENCOUNTERED WITHIN CONSTRUCTION PERIMETERS. FOR SITE LOCATION OF EXISTING UTILITIES INCLUDING MICHIGAN, SOUTH CENTRAL BELL, AND/OR TEXAS GAS COMPANY, PLEASE CALL 1-800-351-1111.
16. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PROPERTIES.
17. THE CONTRACTOR SHALL VERIFY EXISTING DATA AND REPORT ANY SIGNIFICANT DISCREPANCIES TO THE ENGINEER.
18. THE CONTRACTOR IS RESPONSIBLE FOR ACQUIRING THE NECESSARY PERMITS TO COMPLETE THE WORK PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEMARKING AS NEEDED TO PROPERLY AND SAFELY COMPLETE THE WORK.

**LEGEND**



**EROSION AND SEDIMENT CONTROL NOTES:**

1. CONSTRUCTION ENTRANCES (TO OFFICE OR LAY DOWN AREA, AND TO WORK AREAS) TO BE MINIMUM 6' DEPTH 10:01, NO. 1 OR NO. 2 STONE.
2. ALL GRADED SLOPES 2:1 OR STEEPER SHALL BE COVERED WITH AN EROSION CONTROL BLANKET BY NORTH AMERICAN GREEN OR OTHER APPROVED MANUFACTURER. BLANKET SHALL BE DESIGNED FOR THE SLOPE CONDITIONS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
3. INSTALL WHITTLES OR SILT FENCE ALONG CONTOURS TO MINIMIZE PONDING. SEE DETAILS FOR MORE INFORMATION.
4. RP-APP CHECK DAMS SHALL BE PLACED IN ALL DIRECTION DITCHES AND, AS OTHERWISE SHOWN ON THE PLANS (SEE DETAIL FOR SPACING).
5. ALL STOCK PILE AREAS TO BE PROTECTED BY A COMBINATION OF WHITTLES AND SILT FENCE.
6. INSTALL INLET PROTECTION DEVICES IN STORM SEWER INLETS PRIOR TO CONSTRUCTION. SEE PLANS FOR LOCATIONS.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSURE THAT ALL REQUIRED PERMITS HAVE BEEN OBTAINED PRIOR TO BEGINNING ANY CONSTRUCTION OR OTHER ACTING ON THE SITE.
8. ALL NEWLY CUT OR FILL AREAS LACKING ADEQUATE VEGETATION SHALL BE FERTILIZED, MULCHED, SEEDED, AND/OR SOODED TO EFFECTIVELY CONTROL SOIL EROSION.
9. A SPECIFIC INDIVIDUAL SHALL BE DESIGNATED TO BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROLS ON EACH PROJECT SITE.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SOIL EROSION CONTROL MEASURES AS NOTED ON THE PLANS, AS REQUESTED BY THE OWNER DURING CONSTRUCTION, AND AS NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR SUSPENDING THE REQUIREMENTS OF THE STATE OF TENNESSEE DEPARTMENT OF WATER POLLUTION CONTROL, AS SET FORTH IN THE TENNESSEE EROSION & SEDIMENT CONTROL HANDBOOK. ALL SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE CONTRACT SO AS TO PREVENT ANY SEDIMENTATION FROM WASHING OFF THE SITE ONTO ADJACENT PROPERTY OR PUBLIC RIGHT-OF-WAY. SEDIMENT FENCE SHALL BE INSTALLED AS DIRECTED. THE CONTRACTOR SHALL MAINTAIN A LOG OF ALL MAINTENANCE ACTIVITIES FOR THE EROSION CONTROL ELEMENTS AS REQUIRED BY THE STATE OF TENNESSEE DEPARTMENT OF WATER POLLUTION CONTROL.
11. THE PERMIT SHALL BE POSTED ON-SITE AND A COPY OF THE EROSION CONTROL PLAN MUST BE AVAILABLE ON SITE FOR THE DWP INSPECTOR ON REQUEST.
12. EROSION AND SEDIMENT CONTROL MEASURES MUST BE IN PLACE AND FUNCTIONAL BEFORE EARTH MOVING OPERATIONS BEGIN, AND MUST BE CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. TEMPORARY MEASURES MAY BE REMOVED AT THE BEGINNING OF THE WORK DAY, BUT MUST BE REPLACED AT THE END OF THE WORK DAY OR PRIOR TO RAINFALL EVENTS.
13. ALL CONTROL MEASURES SHALL BE CHECKED PER THE SHPP AND STATE REQUIREMENTS. MAINTENANCE AND REPAIRS SHALL BE MADE AS NECESSARY. DURING PROLONGED RAINFALL, DAILY CHECKING AND REPAIRING MAY BE NECESSARY. THE PERMITTEE SHALL MAINTAIN RECORDS OF INSPECTION CHECKS, MAINTENANCE AND REPAIRS.



ITEM NO.	DESCRIPTION OF CHANGE	APPROVAL DATE

**RODNEY BABER PARK GENERAL NOTES AND LEGEND**  
 LOCATION: RODNEY BABER PARK  
 MEMPHIS, TENNESSEE

**SARP10**  
**RODNEY BABER PARK GENERAL**

DIVISION OF ENGINEERING  
 DEVELOPER: City of Memphis  
 ENGINEER: LDA ENGINEERING

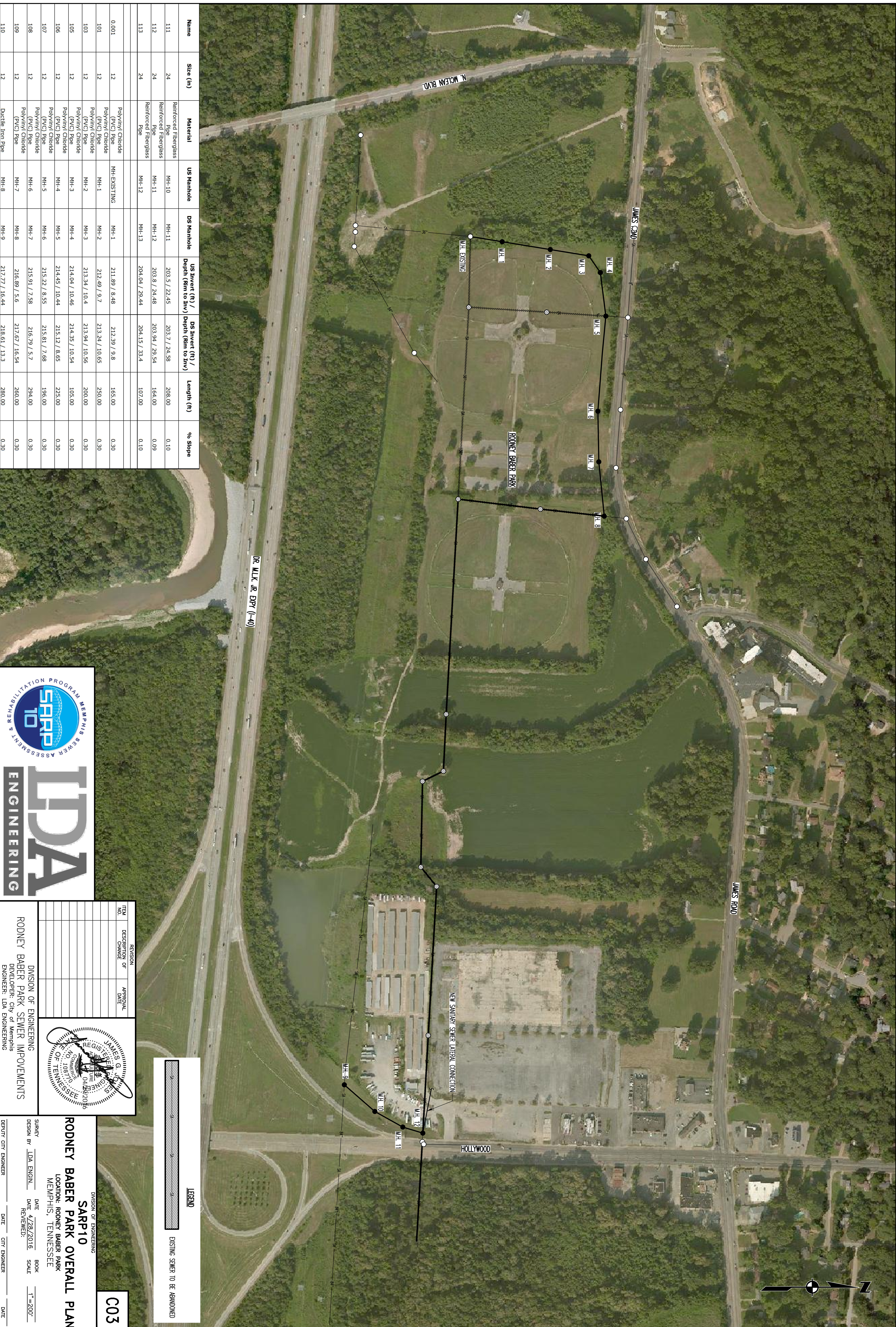
SUPREY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 DESIGN BY: LDA ENGIN. DATE: 4/28/2016  
 REVIEWED: \_\_\_\_\_ SCALE: \_\_\_\_\_  
 DEPUTY CITY ENGINEER DATE CITY ENGINEER DATE

NO SCALE

**C02**



Name	Size (in)	Material	US Manhole	DS Manhole	US Invert (ft) / Depth (ftm to inv)	DS Invert (ft) / Depth (ftm to inv)	Length (ft)	% Slope
111	24	Reinforced Fiberglass Pipe	MH-10	MH-11	203.5 / 22.45	203.7 / 24.58	208.00	0.10
112	24	Reinforced Fiberglass Pipe	MH-11	MH-12	203.8 / 24.48	203.94 / 29.54	164.00	0.09
113	24	Reinforced Fiberglass Pipe	MH-12	MH-13	204.04 / 29.44	204.15 / 33.4	107.00	0.10
0.001	12	Polyvinyl Chloride (PVC) Pipe	MH-EXISTING	MH-1	211.89 / 8.48	212.39 / 9.8	165.00	0.30
101	12	Polyvinyl Chloride (PVC) Pipe	MH-1	MH-2	212.49 / 9.7	213.24 / 10.65	250.00	0.30
103	12	Polyvinyl Chloride (PVC) Pipe	MH-2	MH-3	213.34 / 10.4	213.94 / 10.56	200.00	0.30
105	12	Polyvinyl Chloride (PVC) Pipe	MH-3	MH-4	214.04 / 10.46	214.35 / 10.54	105.00	0.30
106	12	Polyvinyl Chloride (PVC) Pipe	MH-4	MH-5	214.45 / 10.44	215.12 / 8.65	225.00	0.30
107	12	Polyvinyl Chloride (PVC) Pipe	MH-5	MH-6	215.22 / 8.55	215.81 / 7.68	196.00	0.30
108	12	Polyvinyl Chloride (PVC) Pipe	MH-6	MH-7	215.91 / 7.58	216.79 / 5.7	294.00	0.30
109	12	Polyvinyl Chloride (PVC) Pipe	MH-7	MH-8	216.89 / 5.6	217.67 / 16.54	260.00	0.30
110	12	Ductile Iron Pipe	MH-8	MH-9	217.77 / 16.44	218.61 / 13.3	280.00	0.30



REVISION	DESCRIPTION OF CHANGE	APPROVAL DATE

**RODNEY BABER PARK SEWER IMPROVEMENTS**  
 DIVISION OF ENGINEERING  
 DEVELOPER: City of Memphis  
 ENGINEER: LDA ENGINEERING

**RODNEY BABER PARK OVERALL PLAN**  
 DIVISION OF ENGINEERING  
 SARP10  
 LOCATION: RODNEY BABER PARK  
 MEMPHIS, TENNESSEE

SURVEY BY: LDA ENGIN. DATE: 4/28/2016 BOOK: 1"=200'  
 DESIGNER: DATE: REVIEWED: SCALE:

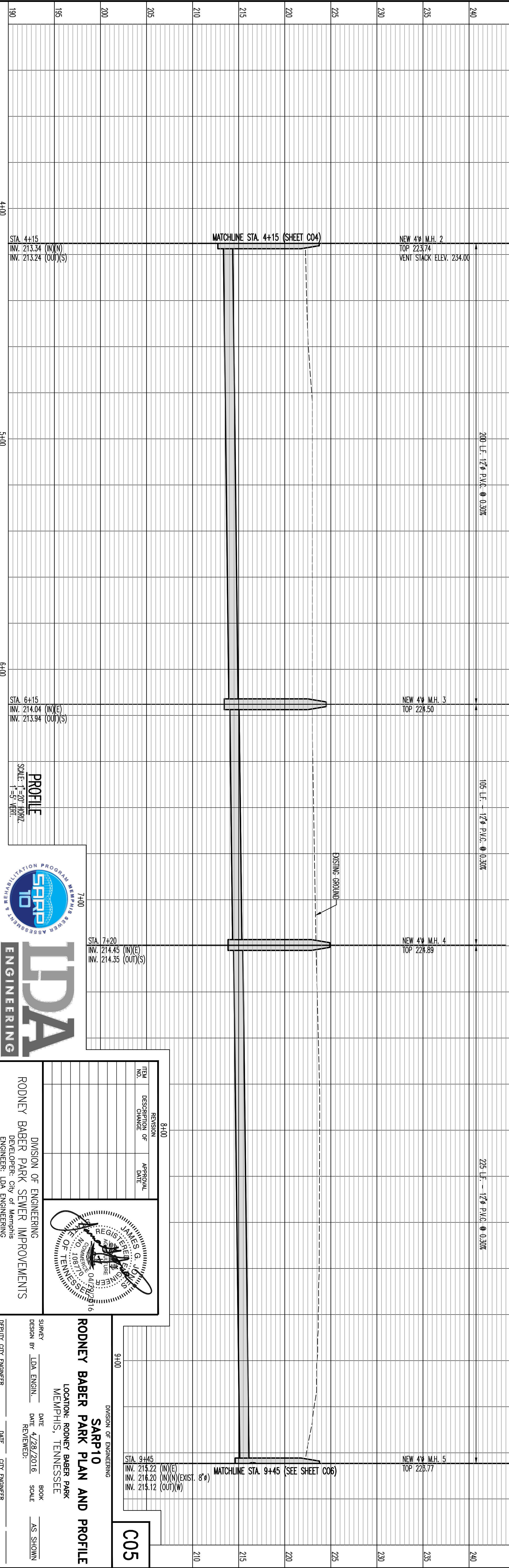
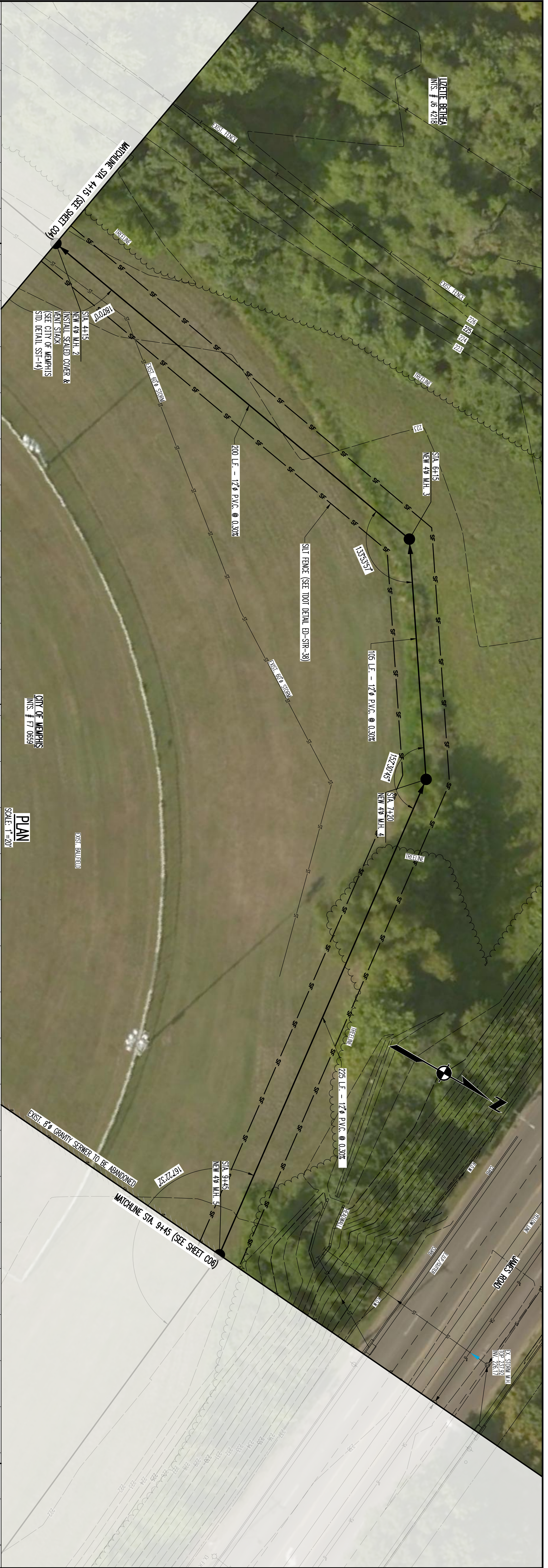
DEPUTY CITY ENGINEER DATE: CITY ENGINEER DATE:

**C03**



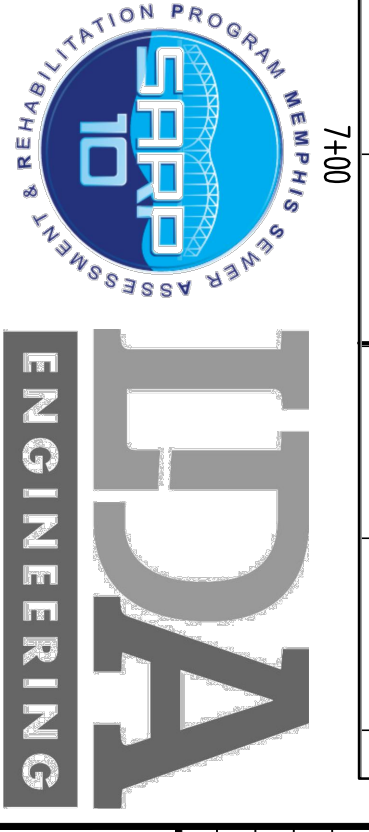




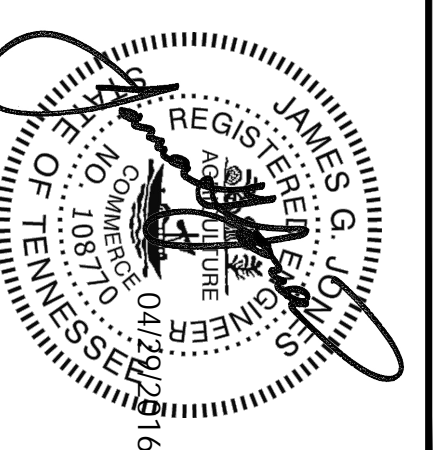


PROFILE  
SCALE: 1"=20' HORIZ.  
1"=5' VERT.

PLAN  
SCALE: 1"=20'



REVISION NO.	DESCRIPTION OF CHANGE	APPROVAL DATE

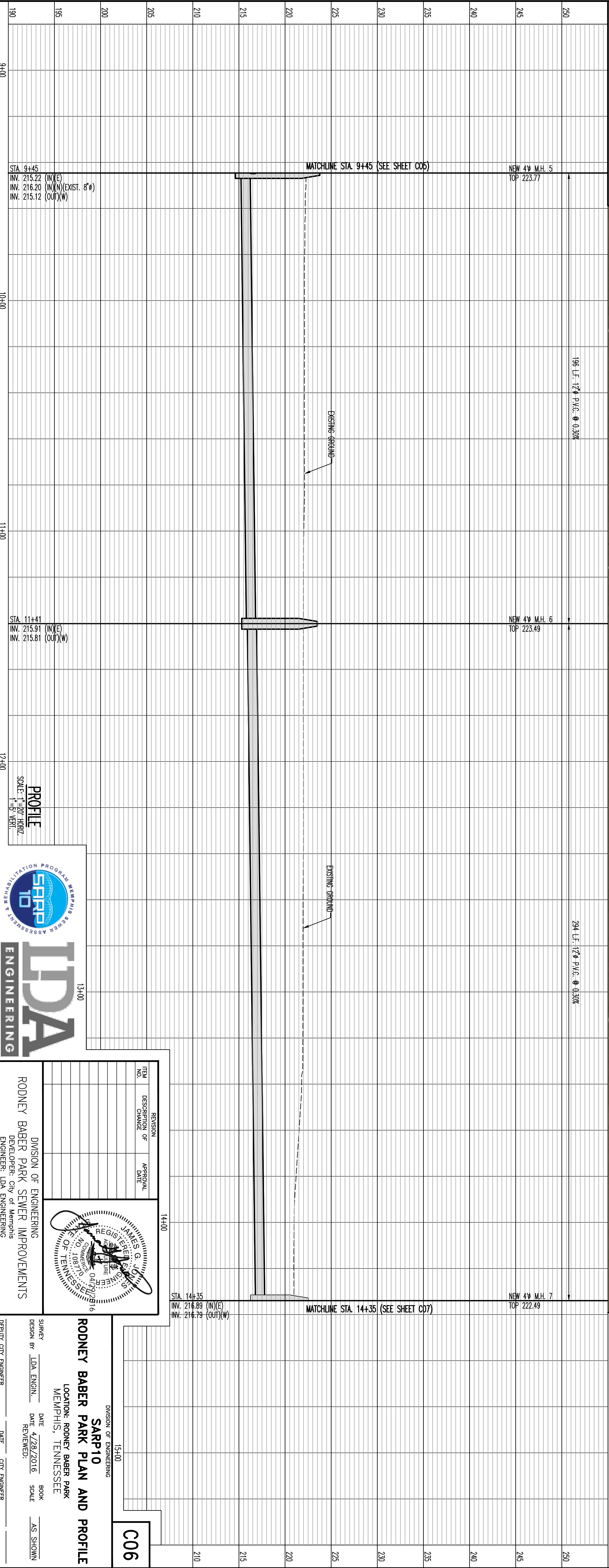
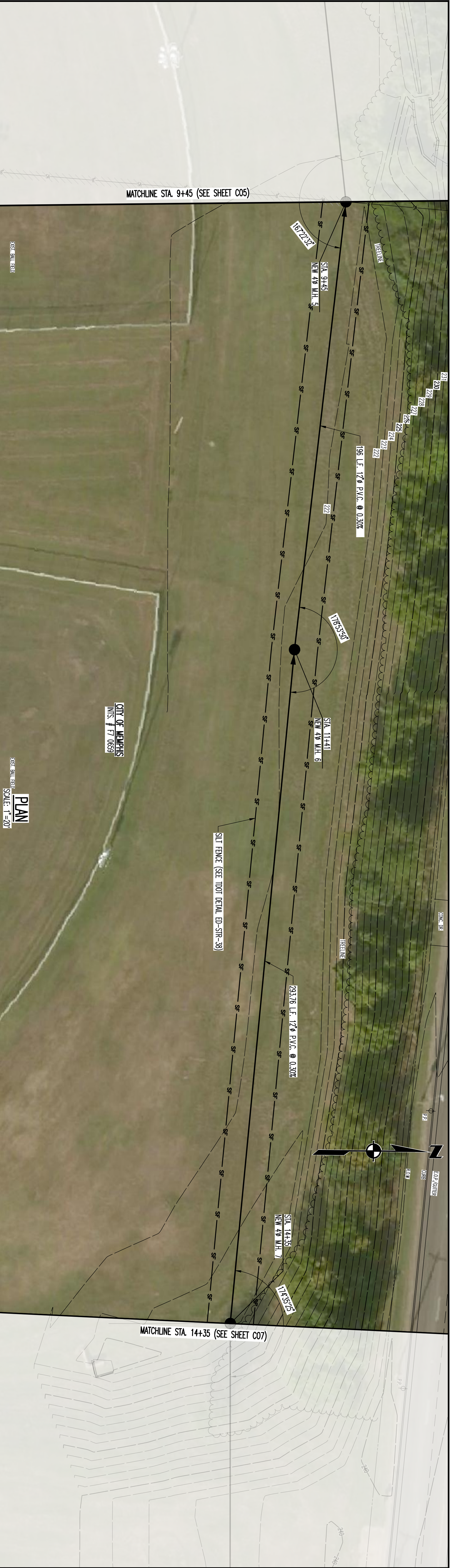


**RODNEY BABER PARK PLAN AND PROFILE**  
 SARP 10  
 DIVISION OF ENGINEERING  
 LOCATION: RODNEY BABER PARK  
 MEMPHIS, TENNESSEE

SURVEY BY: LDA ENGIN. DATE: 4/28/2016 BOOK: AS SHOWN  
 DESIGN BY: LDA ENGIN. DATE: 4/28/2016 REVIEWER: [Signature]  
 DEPUTY CITY ENGINEER DATE: [Blank] CITY ENGINEER [Signature]

**C05**





**PROFILE**  
SCALE: 1"=20' HORIZ.  
1"=5' VERT.



ITEM NO.	DESCRIPTION OF CHANGE	APPROVAL DATE

**RODNEY BABER PARK SEWER IMPROVEMENTS**  
DEVELOPER: City of Memphis  
ENGINEER: LDA ENGINEERING

**RODNEY BABER PARK PLAN AND PROFILE**  
SARP 10  
DIVISION OF ENGINEERING  
MEMPHIS, TENNESSEE

DATE: 4/28/2016  
SCALE: AS SHOWN

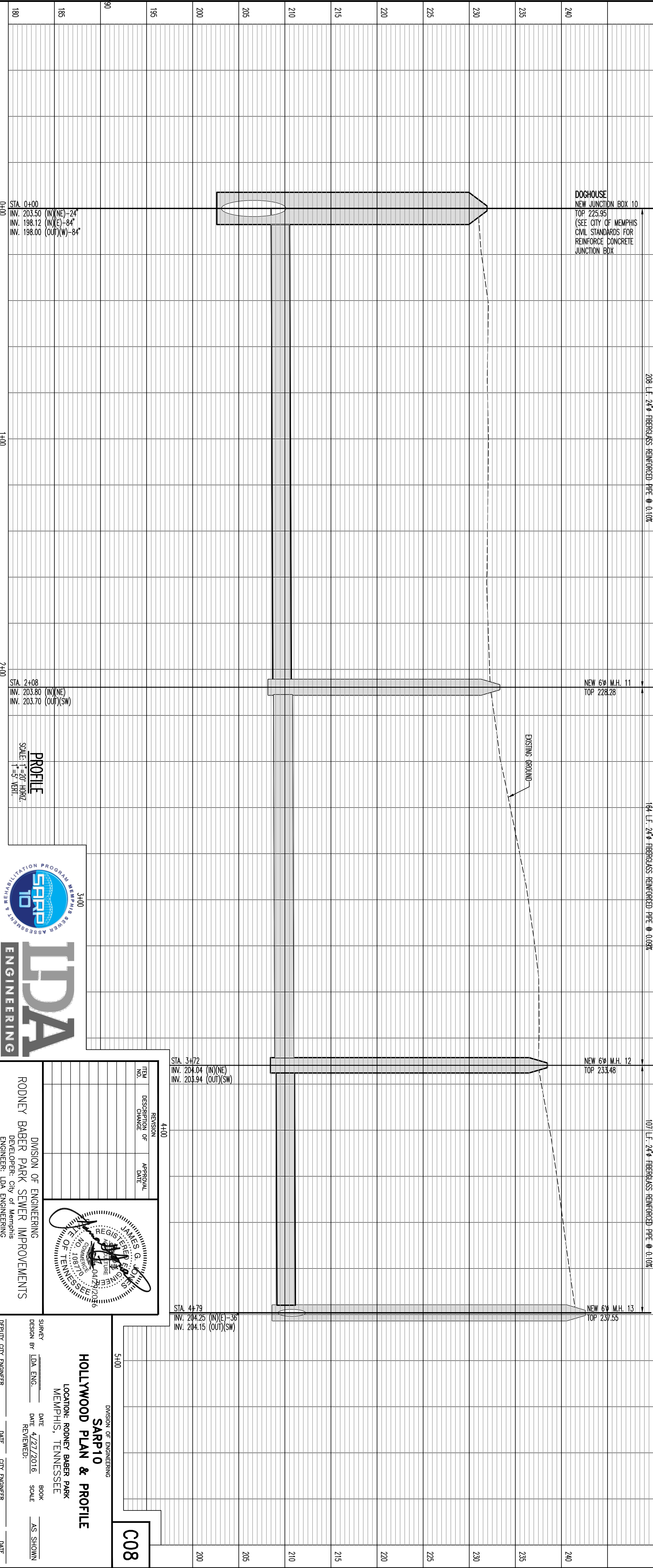
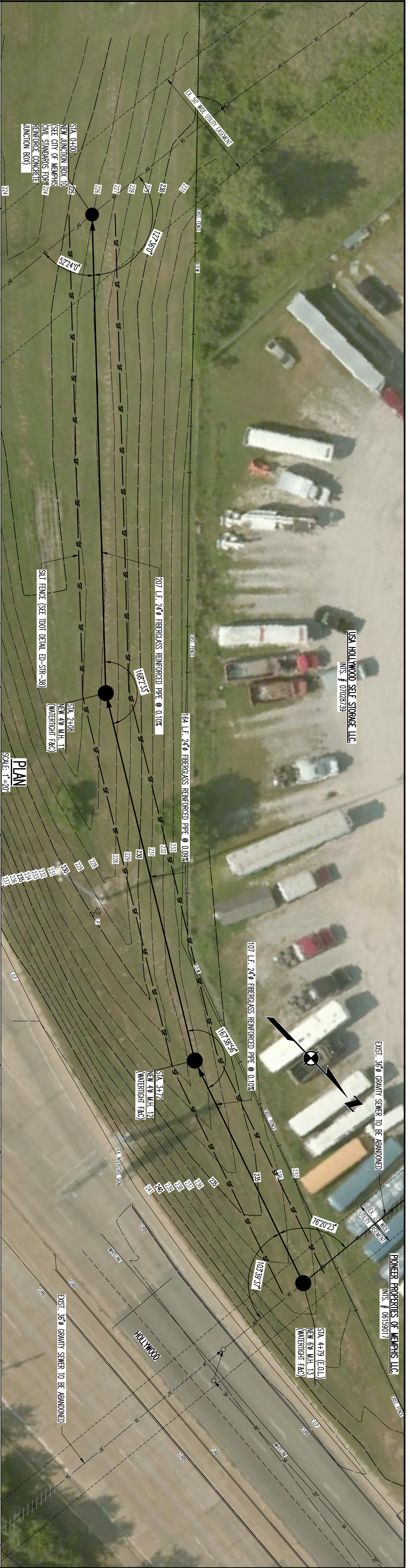
DEPUTY CITY ENGINEER: \_\_\_\_\_ DATE: \_\_\_\_\_  
CITY ENGINEER: \_\_\_\_\_ DATE: \_\_\_\_\_

**C06**









STA. 0+00  
 INV. 203.50 (N)(NE)-24"  
 INV. 198.12 (N)(E)-84"  
 INV. 198.00 (OUT)(W)-84"

STA. 2+08  
 INV. 203.80 (N)(NE)  
 INV. 203.70 (OUT)(SW)

STA. 3+72  
 INV. 204.04 (N)(NE)  
 INV. 203.94 (OUT)(SW)

STA. 4+79  
 INV. 204.25 (N)(E)-36"  
 INV. 204.15 (OUT)(SW)

**PROFILE**  
 SCALE: HORIZ. = 20'  
 VERT. = 5'



ITEM NO.	DESCRIPTION OF CHANGE	APPROVAL DATE

**REGISTRATION**  
 REGISTERED PROFESSIONAL ENGINEER  
 STATE OF TENNESSEE  
 NO. 004273  
 JAMES G. JONES

**APPROVAL**  
 DIVISION OF ENGINEERING  
 DEVELOPER: City of Memphis  
 ENGINEER: LDA ENGINEERING

**DESIGNER**  
 SURVEY BY: LDA ENG.  
 DESIGN BY: LDA ENG.  
 DATE: 4/27/2016  
 REVIEWED: \_\_\_\_\_  
 SCALE: AS SHOWN

**DEPUTY CITY ENGINEER** \_\_\_\_\_ DATE \_\_\_\_\_  
**CITY ENGINEER** \_\_\_\_\_ DATE \_\_\_\_\_

**C08**

**HOLLYWOOD PLAN & PROFILE**

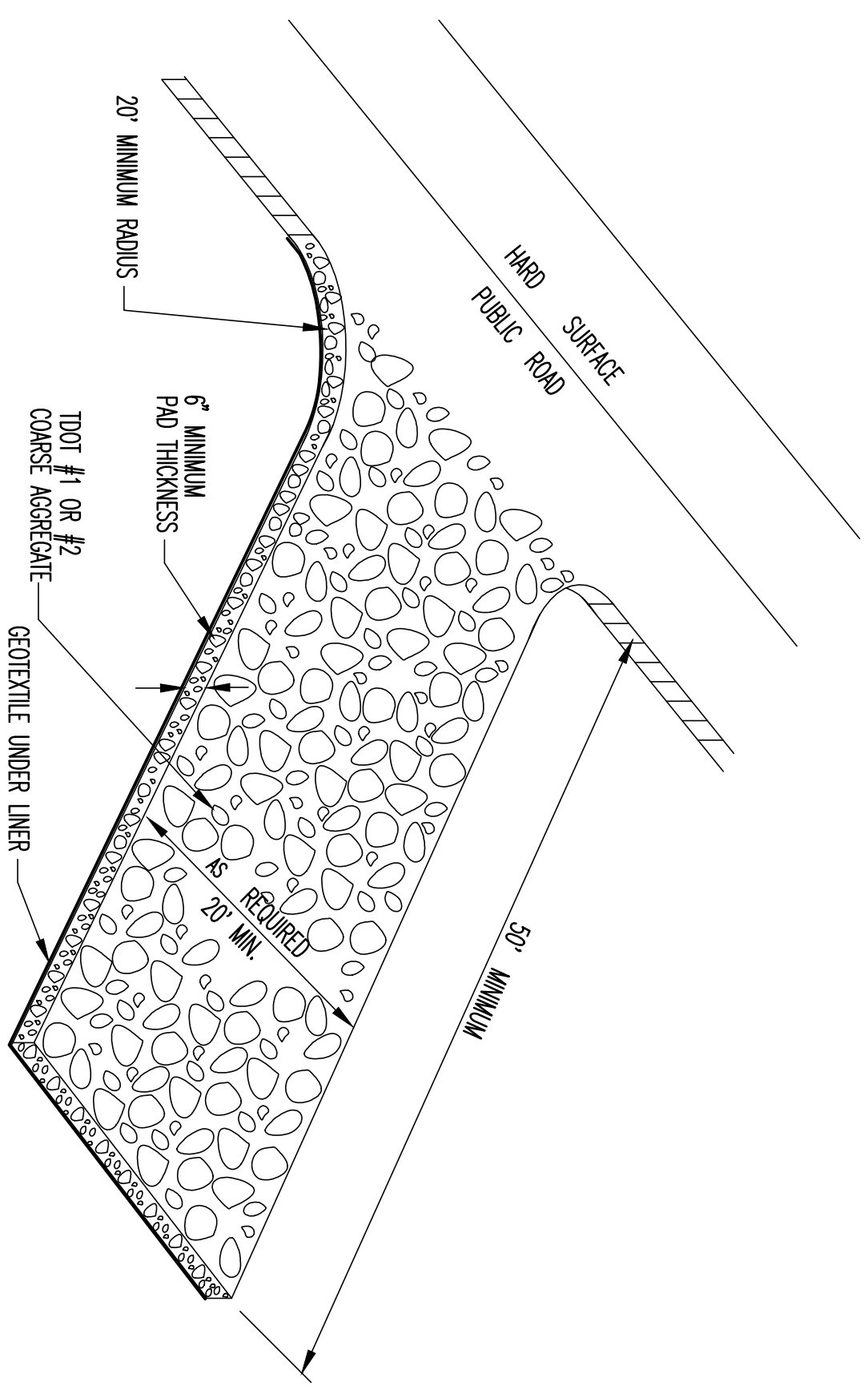
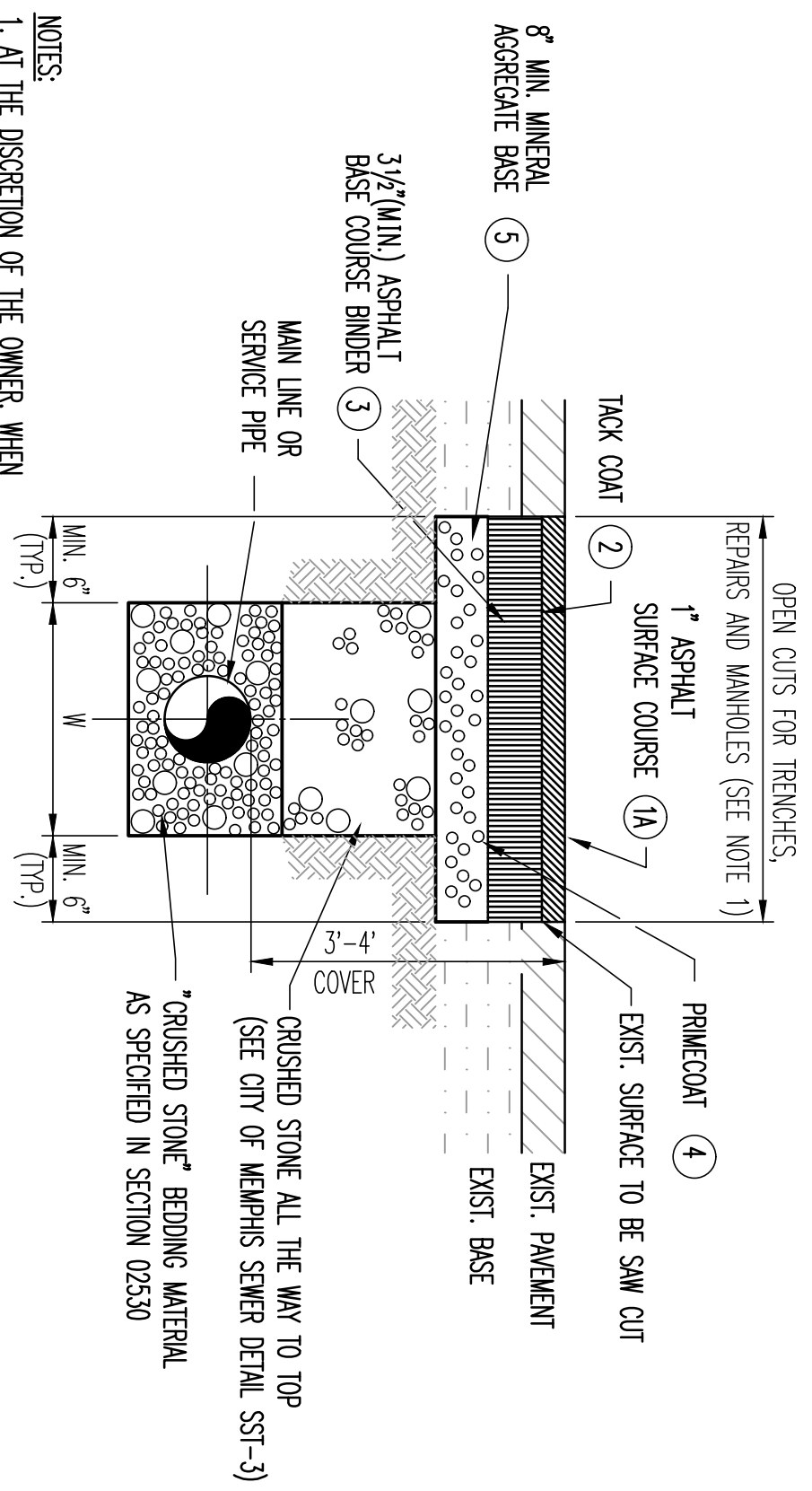
**SARP 10**  
 DIVISION OF ENGINEERING

LOCATION: RODNEY BABER PARK  
 MEMPHIS, TENNESSEE

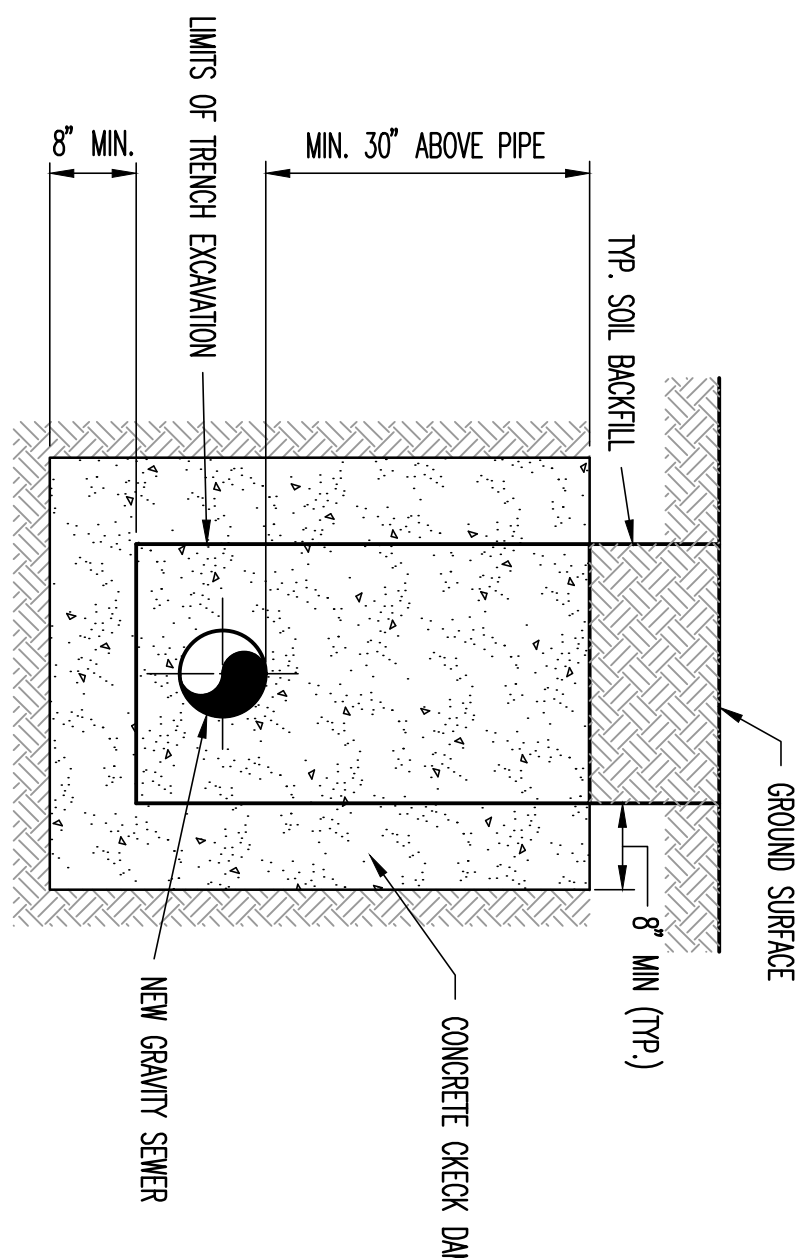


- NOTES:
1. AT THE DISCRETION OF THE OWNER, WHEN TRENCH PARALLELS CENTERLINE OF ROADWAY AND WIDTH IS EQUAL TO OR GREATER THAN HALF THE LANE WIDTH, THEN THE PAVEMENT WIDTH FOR THE SURFACE COURSE SHALL BE FOR AN OVERLAY OF THE ROADWAY ENTIRE LANE WIDTH.
  2. FOR PATCH SIZES, TRENCH WIDTHS AND PAVEMENT WIDTHS, SEE PAVEMENT WIDTH SCHEDULE THIS SHEET.

**TYPICAL ASPHALT PAVEMENT REPLACEMENT - TYPE "A"**  
**CITY STREETS & STATE HIGHWAYS**

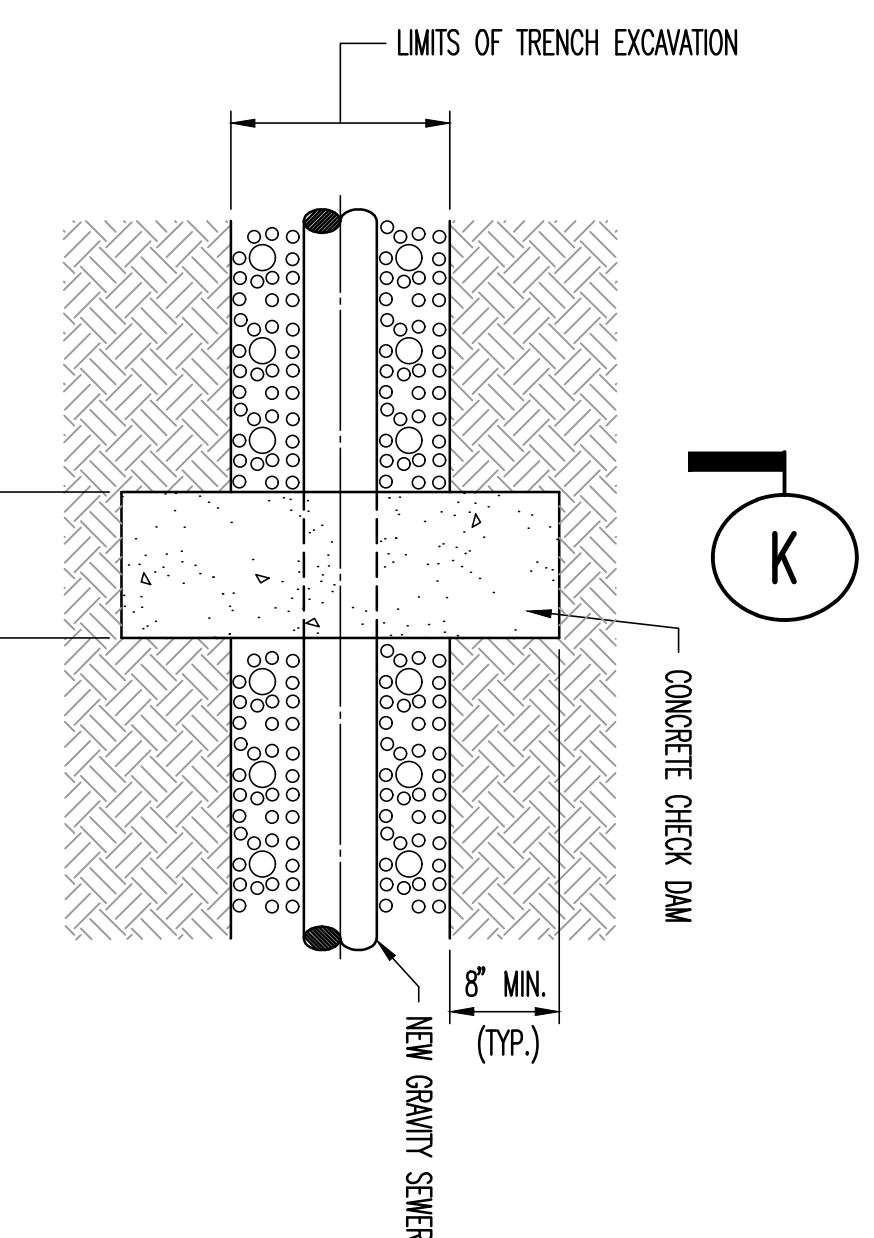


**GRAVEL CONSTRUCTION ENTRANCE**



**SECTION K**

**GRAVITY SEWERS IN NON-PAVED AREAS**



**PLAN K**

**CHECK DAMS FOR GRAVITY SEWERS**

- NOTES:
1. FOR SEWERS 15" AND SMALLER DIAMETER, DISCONNECT SEWER AS SHOWN, INSERT MECHANICAL PLUGS, PLACE CONCRETE, PARING AND COAT WITH TWO COATS OF ASPHALT-BASED COATING.
  2. FOR SEWER 18" AND LARGER DIAMETER SAME AS 15" AND SMALLER EXCEPT MASONRY BULKHEAD MAY BE SUBSTITUTED FOR MECHANICAL PLUG.
  3. RESHAPE AND FILL EXISTING CHANNEL AS NECESSARY TO PROVIDE SMOOTH CONTOUR BETWEEN INCOMING AND OUTGOING PIPES.

- NOTES:
1. PAVEMENT DEPTHS SHOWN IN THE DETAILS ARE MINIMUM FOR THIS PROJECT, BUT MAY BE INCREASED AT THE DISCRETION OF THE ENGINEER.
  2. ROADWAYS AND HIGHWAYS SHALL HAVE SURFACE COURSE PLACED AND HEAT BLENDED AND SEALED TO EXISTING PAVEMENT TO PRODUCE A SMOOTH/SEALED SURFACE.
  3. MEANS, METHODS AND EQUIPMENT SHALL BE SUBMITTED AND APPROVED BY THE ENGINEER PRIOR TO BEGINNING WORK ON THE PROJECT.

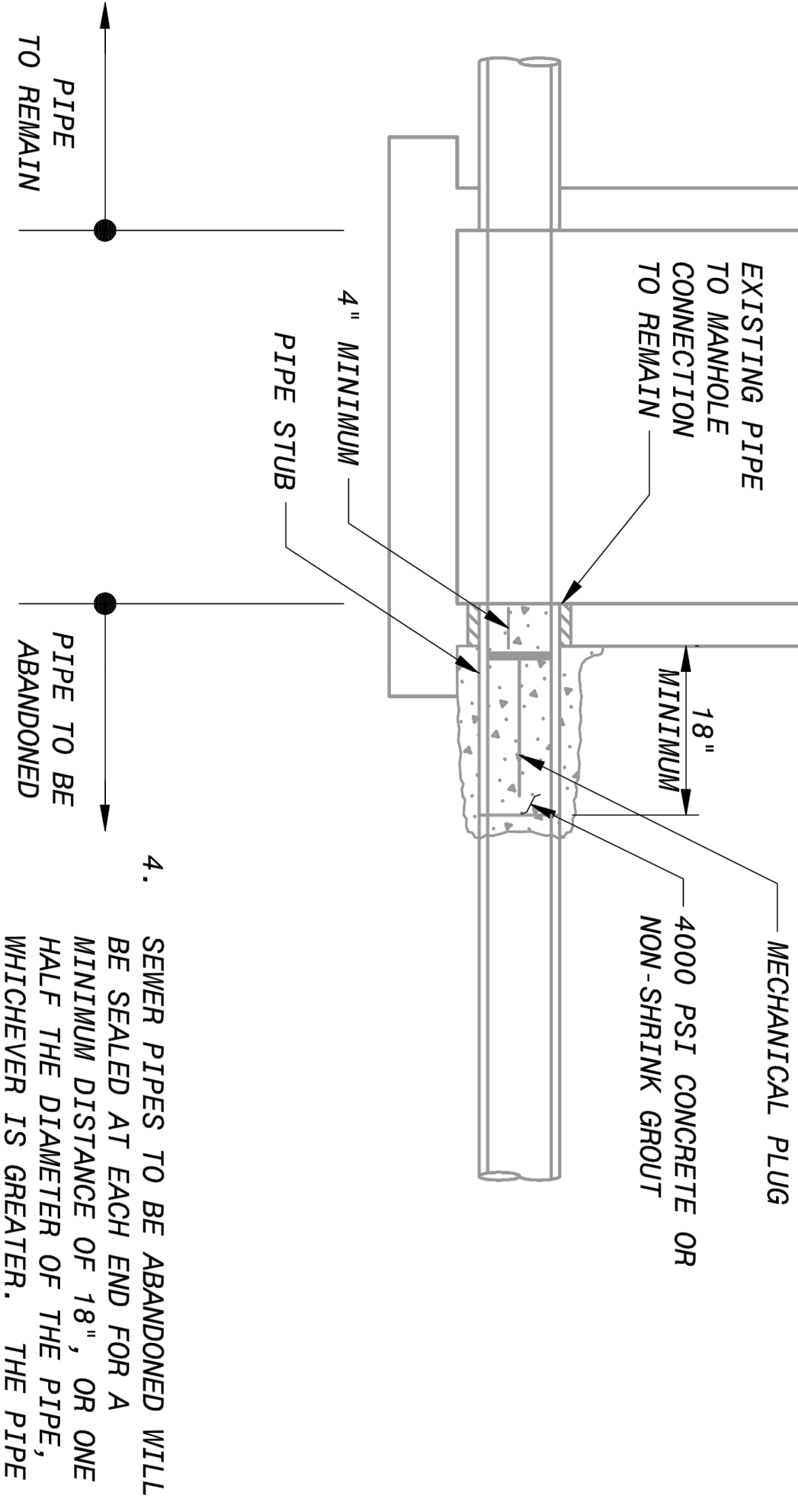
**PAVEMENT SCHEDULE**

① BITUMINOUS SURFACING COURSE (ROADWAY) - SEE SPECIFICATION 02610 A. 411E (MODIFIED) B. 411E (12.011 STD. OR MODIFIED)			
② BITUMINOUS MATERIAL FOR TACK COAT (TC) (RATE - 0.02 GAL./SQ.YARD)			
③ BITUMINOUS BINDER COURSE (ROADWAY) @ MIN. 3 1/2" THICK - 307 B - SEE SPECIFICATION 02610			
④ BITUMINOUS MATERIAL FOR PRIME COAT (PC) (RATE - 0.35 GAL./SQ. YARD)			
⑤ MINERAL AGGREGATE BASE @ MIN. 8" DEEP TYPE "A" BASE, GRADING "D"			

**PAVEMENT WIDTH SCHEDULE**

DEPTH FROM SURFACE TO INVERT (FEET)	WIDTH OF TRENCH (INCHES)	PAVEMENT PATCH WIDTH (INCHES)	MANHOLES SIZE OF PATCH (FEET)
4.0	PPE DIAMETER + 18"	WIDTH + 12"	12 x 12
4.1 TO 8.0	PPE DIAMETER + 36"	WIDTH + 12"	14 x 14
8.1 TO 12.0	PPE DIAMETER + 42"	WIDTH + 12"	16 x 16
12.1 AND UP	PPE DIAMETER + 42"	WIDTH + 12" (A)	16 x 16 (A)

- NOTES:
- (A) MAXIMUM PAVEMENT WIDTH AND/OR SIZE FOR ANY DEPTH OF TRENCH.
  - (B) PATCHES SHALL BE MADE IN STRICT ACCORDANCE WITH SECTIONS 01150 AND 02610.

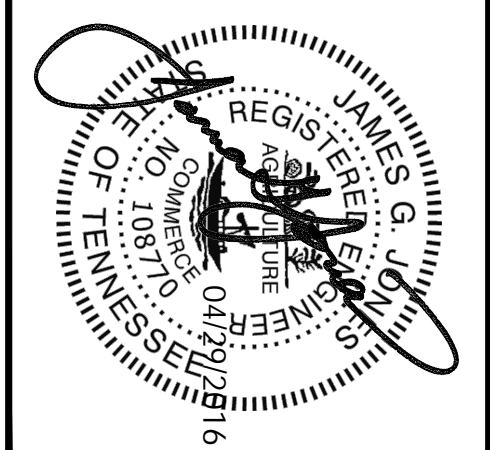


**ABANDONMENT OF PIPE AT MANHOLE**

- NOTES:
- SEWER PIPES TO BE ABANDONED WILL BE SEALED AT EACH END FOR A MINIMUM DISTANCE OF 18", OR ONE HALF THE DIAMETER OF THE PIPE, WHICHEVER IS GREATER. THE PIPE WILL BE SEALED WITH A BRICK BULKHEAD AND/OR ACCEPTABLE CEMENT GROUT TO FORM A SOLID WATER-TIGHT PLUG COMPLETELY BONDED TO THE PIPE.



TITLE	DESIGN	REVISION	APPROVAL
RODNEY BABER PARK SEWER IMPROVEMENTS <td></td> <td></td> <td></td>			

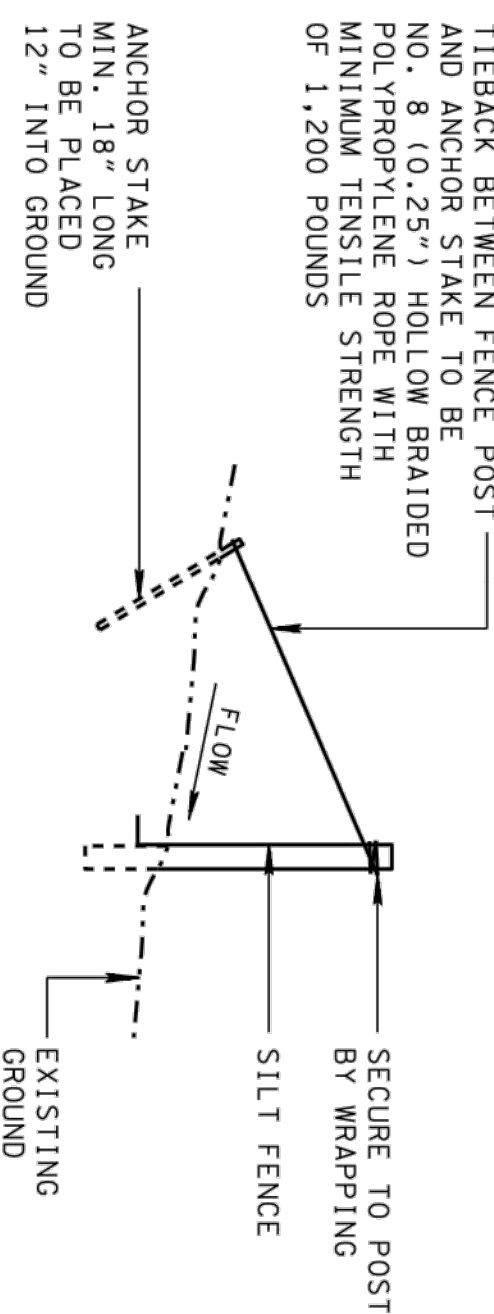
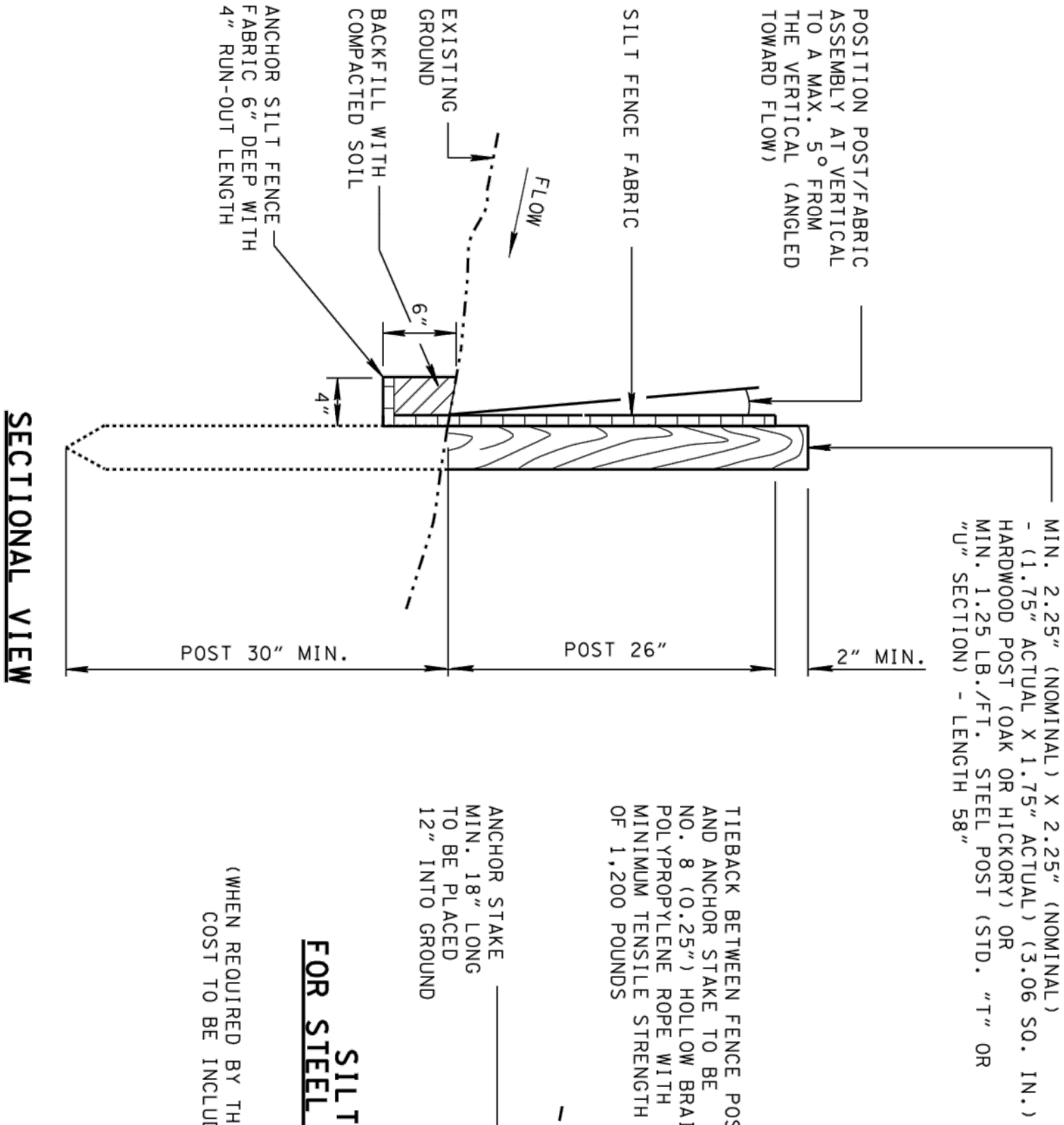
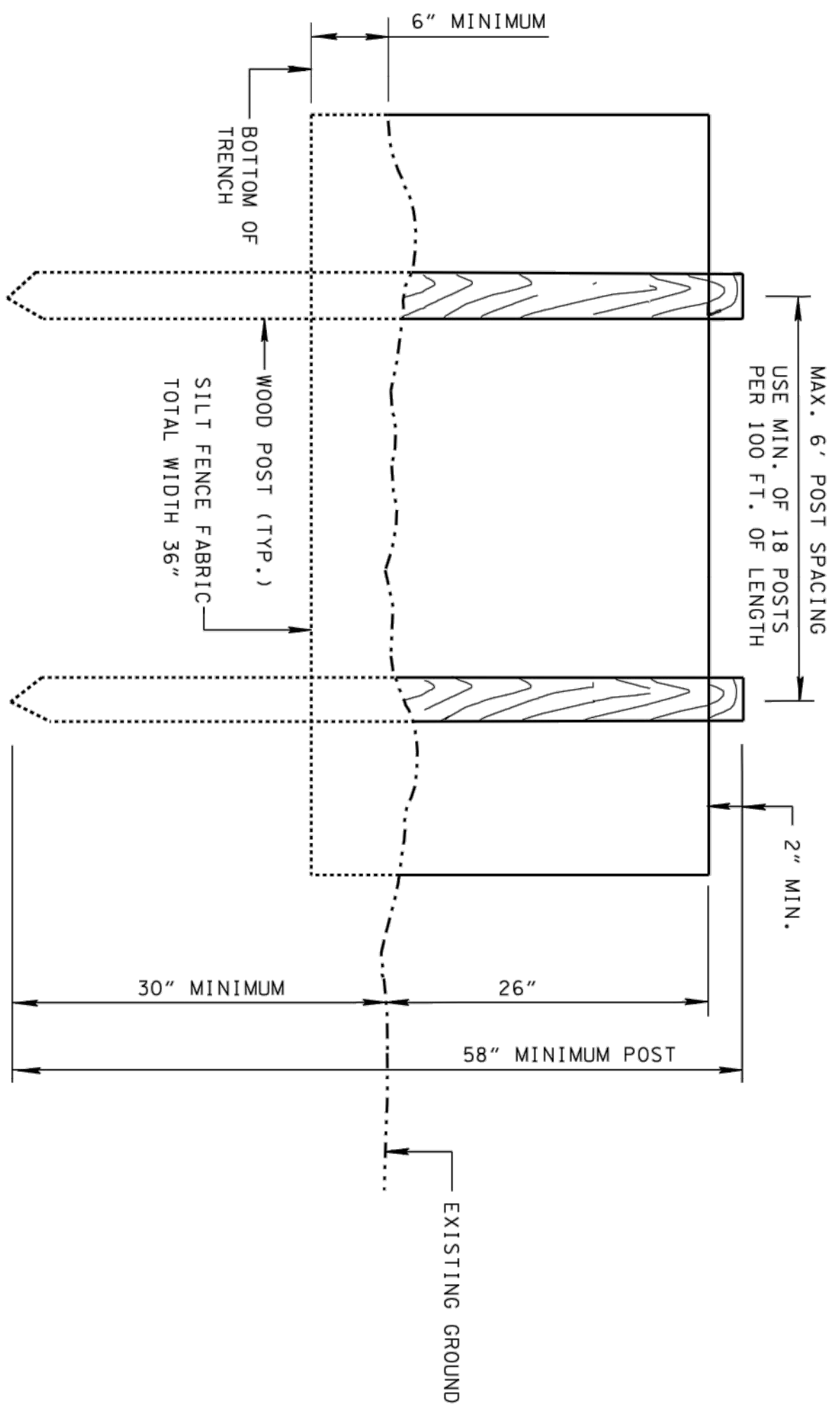


DIVISION OF ENGINEERING  
**RODNEY BABER PARK TYP. DETAILS**  
 LOCATION: RODNEY BABER PARK  
 MEMPHIS, TENNESSEE

DATE: 4/28/2016  
 SCALE: NO SCALE

**C09**





(WHEN REQUIRED BY THE ENGINEER OR NOTED IN THE PLANS, COST TO BE INCLUDED IN THE ITEMS FOR SILT FENCE.)

EROSION CONTROL PLAN LEGEND: \* SF \* SF \* SF \* SILT FENCE

**SEEDING CHART**

TIME OF YEAR	TYPE	% BY WEIGHT
FEBRUARY - MARCH	KI-31 TALL FESCUE ENGLISH RYE KOREAN LESPELIZA	80 5 15
JUNE - SEPTEMBER	KI-31 TALL FESCUE ENGLISH RYE KOREAN LESPELIZA GERMAN MILLET	55 20 15 10
OCTOBER - JANUARY	KI-31 TALL FESCUE ENGLISH RYE WHITE CLOVER	70 20 10

\* FOR MORE INFORMATION PLEASE SEE SPPFP FOR THIS PROJECT.

**SILT FENCE FABRIC SPECIFICATIONS**

FABRIC PROPERTY AND TEST METHODS	REQUIRED PHYSICAL PROPERTIES (MANY VALUES OF TEST DATA)
GEOTEXTILE FABRIC TYPE	WOVEN SILT FILM
APPEARANT OPENING SIZE (ASTM D4751)	# 30 TO # 70 STANDARD SIEVE
WATER FLUX (ASTM D4491)	≥ 4 GPM/FT <sup>2</sup>
TENSILE STRENGTH (ASTM D4632)	≥ 120 LB. (WARP DIRECTION) X 100 LB. (FILL DIRECTION)
ULTRAVIOLET STABILITY (AFTER 500 HRS PER ASTM D4355)	≥ 70%
ELONGATION (ASTM D4632)	≤ 20% (MAX)
BURST STRENGTH (ASTM D3786)	≥ 250 PSI
PUNCTURE STRENGTH (ASTM D4833)	≥ 60 LB.
TRAPEZOIDAL TEAR (ASTM D4533)	≥ 90 LB. (WARP DIRECTION) X 40 LB. (FILL DIRECTION)

**SILT FENCE GENERAL NOTES**

- (A) SILT FENCE IS USED TO INTERCEPT SMALL AMOUNTS OF SEDIMENT AND REDUCE VELOCITY FROM SHEET FLOW ONLY. DO NOT USE IT ADJACENT TO NATURAL WATER RESOURCES (WETLANDS OR STREAMS) OR ACROSS CONCENTRATED FLOW PATHS.
- (B) THE MAXIMUM DRAINAGE AREA SIZE FOR A CONTINUOUS BARRIER SHALL BE 1/4 ACRE PER 100 LINEAR FEET OF FENCE LENGTH UP TO A MAXIMUM DRAINAGE AREA OF 2 ACRES. MAXIMUM SLOPE LENGTH BEHIND FENCE ON UPSLOPE SIDE SHALL BE 110 FEET (AS MEASURED ALONG THE GROUND SURFACE).
- (C) WHEN INSTALLED AT THE TOE OF A SLOPE, SILT FENCE SHOULD BE PLACED 5 FEET TO 7 FEET AWAY FROM THE TOE TO ALLOW SPACE FOR PONDING OF WATER, COLLECTION OF SEDIMENT, AND EASE OF MAINTENANCE AND REMOVAL. WHEN TWO SECTIONS OF SILT FENCE FABRIC ADJOIN EACH OTHER THEY SHALL BE JOINED ACCORDING TO THE DETAILS ON STANDARD DRAWING EC-S18-3E.
- (D) MAINTENANCE SHALL BE PERFORMED AS NEEDED; CAPTURED SOIL MATERIAL SHALL BE REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE AND/OR OTHER EVIDENCE OF FILTER CLOGGING IS OBSERVED.
- (E) STEEL POSTS SHALL BE ROLLED FROM HIGH CARBON STEEL AND SHALL HAVE A MINIMUM WEIGHT OF 1.25 LB./FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH GRADE WEATHER RESISTANT STEEL PAINT. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED TO AID IN THE ATTACHMENT OF THE WIRE BACKING. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702.
- (F) WHEN STEEL POSTS ARE USED THEY SHALL HAVE A PROJECTION FOR FASTENING WIRE TO THEM. THE WIRE FASTENERS SHOULD BE EVENLY SPACED WITH AT LEAST FIVE PER POST.
- (G) IF THE FILTER MATERIAL IS STAPLED TO THE WOODEN STAKES, HEAVY DUTY WIRE STAPLES WITH ONE-HALF INCH LENGTH AND 1 INCH WIDTH SHALL BE USED AND EVENLY SPACED WITH AT LEAST FOUR PER POST. SILT FENCE FABRIC SHALL NOT BE STAPLED TO TREES.
- (H) SILT FENCES SHOULD BE PLACED ALONG OR NEAR THE GROUND CONTOUR. THE BOTTOM OF FENCE AT GROUNDLINE SHOULD BE ON A MINIMUM 5% GRADE. PLUS OR MINUS TOLERANCES SHALL BE ±0.5% IN EITHER DIRECTION. THE ENDS OF SILT FENCE SHOULD BE TURNED UPSLOPE FORMING A 90-DEGREE TURN TO FILTER ANY CONCENTRATED FLOW BEHIND FENCE. A PREASSEMBLED SILT FENCE MEETING THE REQUIREMENTS OF THIS DRAWING IS ACCEPTABLE IN LIEU OF A FIELD CONSTRUCTED SILT FENCE.
- (I) STATIC SLICING IS THE PREFERRED METHOD OF FENCE INSTALLATION. STATIC SLICING INVOLVES THE INSERTION OF A NARROW CUTTING BLADE, PLACED AT THE SPECIFIED ANCHOR DEPTH FOR THE GIVEN FABRIC AS SHOWN ON THE APPLICABLE DETAIL. AND SIMILARLY, PULLING THE FENCE FABRIC INTO THE TRENCH AS THE TRENCH IS BEING EXCAVATED. ALTERNATE TRENCH-BASED METHODS ARE ALSO ACCEPTABLE, FOR TRENCH-BASED INSTALLATIONS. SILT FENCING SHALL BE INSTALLED PER THE FOLLOWING STEPS AND IN THE FOLLOWING ORDER:
  - EXCAVATE TRENCH A MAXIMUM OF 4 INCHES WIDE AND 6 INCHES DEEP. THE TRENCH SHALL BE HAND-CLEANED FOLLOWING EXCAVATION TO REMOVE BULKY DEBRIS SUCH AS ROCKS, STICKS, AND SOIL CLODS FROM THE TRENCH.
  - INSTALL FABRIC IN TRENCH.
  - BACKFILL TRENCH (OVER-FILL) WITH SOIL PLACED AROUND FABRIC.
  - COMPACT SOIL BACKFILL WITH MECHANICAL EQUIPMENT. DO NOT DAMAGE THE FABRIC DURING COMPACTION (DAMAGED FABRIC SHALL BE REPLACED).
  - DRIVE AND SET SUPPORT POSTS PER SPACING REQUIREMENTS GIVEN ON THE APPLICABLE FENCE DETAIL. FOR PRE-ASSEMBLED SILT FENCE, DRIVE SUPPORT IN TO GROUND FIRST, FOLLOWED BY FABRIC PLACEMENT IN TRENCH.
  - ATTACH FABRIC TO THE POSTS USING WIRE TIES OR STAPLES. SPACING AND DENSITY OF TIES OR STAPLES SHALL BE INSTALLED AS DESCRIBED IN NOTES F AND G.
- (J) ONLY SILT FENCE FABRIC LISTED ON THE QUALIFIED PRODUCTS LIST MAY BE USED. ANY PRODUCTS LISTED ON THE QUALIFIED PRODUCTS LIST AS AN APPROVED ALTERNATE MAY ALSO BE USED.
- (K) SILT FENCE SHALL BE PAID FOR UNDER THE FOLLOWING ITEM NUMBER:
  - 209-08.03 TEMPORARY SILT FENCE (WITHOUT BACKING) PER LINEAR FOOT
- (L) PAYMENT SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR CONSTRUCTION, MAINTENANCE, AND REMOVAL OF THE SILT FENCE.
- (M) SEDIMENT SHALL BE REMOVED FROM BEHIND THE SILT FENCE WHEN IT HAS ACCUMULATED TO ONE-HALF THE ORIGINAL HEIGHT OF THE STRUCTURE AND PAID FOR UNDER ITEM NUMBER 209-05, SEDIMENT REMOVAL PER CUBIC YARD.

□ MINOR REVISION - CHINA APPROVAL NOT REQUIRED.

- REV. 12-18-03: MODIFIED TABLE 1 AND GENERAL NOTE 1
- REV. 7-29-04: CHANGED VALUES IN TABLE 1 FROM MEAN TO MAX VALUES.
- REV. 4-15-06: REMOVED POA SPECS. FROM TABLE. ADDED NOTE TO REVISED TABLE TITLE. REFORMATTED GENERAL NOTES. REFORMATTED SHEET. REVISED NOTES, MISC. EDITS TO DRAWING.
- REV. 4-1-08: REMOVED TEMPORARY REFERENCE, REVISED NOTES, AND MISC. EDITS TO DRAWING.
- REV. 8-1-12: MINOR EDITS TO GENERAL NOTES.



ITEM NO.	DESCRIPTION/CHANGE OF	APPROVAL DATE

DIVISION OF ENGINEERING

**RODNEY BABER PARK TYP. DETAILS**

LOCATION: RODNEY BABER PARK  
MEMPHIS, TENNESSEE

SURVEY BY: LDA ENGIN. DATE: 4/28/2016 BOOK: NO SCALE

DESIGN BY: LDA ENGIN. DATE: 4/28/2016 SCALE: NO SCALE

DEVELOPER: City of Memphis

ENGINEER: LDA ENGINEERING

DEPUTY CITY ENGINEER: DATE: CITY ENGINEER: DATE:

**C10**