



**REQUEST FOR BID
FOR
Old Loosahatchie Hwy 51 Emergency Sewer Line
Replacement**

RFB No. 179821.71.0405

June 1, 2015



City of Memphis, Tennessee

Black & Veatch Corporation and Overland Contracting Inc. (OCI), a subsidiary of Black & Veatch Corporation, 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, June 8, 2015** for furnishing the City of Memphis with the following:

FOR THE DIVISION OF: PUBLIC WORKS FOR THE CONSTRUCTION OF:
SARP10 Program Old Loosahatchie Hwy 51 Emergency Sewer Line Replacement

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 have submitted Registration documents electronically to B&V/OCI per the instructions included in Advertisement Legal Notice Request for Bid No. 179821.71.0405 dated **June 1, 2015**. Registration documents are due **June 4, 2015**.

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 (WCCTS) 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 general scope of Work for this bid involves a sewer line relay of approximately 6,000 LF of the Old Loosahatchie 42" Sewer Interceptor near Highway 51 & Watkins. The Subcontractor will be replacing the current interceptor with 42" Hobas pipe. It is intended that the Subcontractor will use the existing easement of the Old Loosahatchie interceptor. There will be some portions of the interceptor that must be installed using trenchless technologies, such as the segments under Highway 51. The interceptor depth ranges between 20' to 30'. This Work also includes replacement of 15 manholes. The impetus for this work is due to failures and settling on this portion of the Old Loosahatchie sewer interceptor.

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 bid 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 Disadvantaged Business Enterprise (DBE) and Minority Business Enterprise/ Women Business Enterprise (M/WBE) Requirements

This section shall set forth the respondent's DBE and 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 DBE and M/WBE firms participating; and (3) the names of the DBE and M/WBE firms the Respondent plans to utilize in the performance of the Subcontract resulting from this RFB.

DBE SRF Fair Share Goals:

MBE minimum 2.6%
WBE minimum 2.6%

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

SARP10 MBE/WBE Participation Goal:

MBE and/or WBE minimum 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 a



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 up to **June 4, 2015**. 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 IN WRITING OR BY E-MAIL TO:

SARP10 Program

Attn: Brad Davis

3485 Poplar Ave, Suite 230

Memphis, TN 38111

E-Mail: DavisBJ@bv.com

Cc: KinkelaarAB@bv.com

(Reference: SARP10 Program Old Loosahatchie Hwy 51 Emergency Sewer Line Replacement, BID SUBMITTAL No. 179821.71.0405)

Each written request must reference the Bid name and number "SARP10 Program Old Loosahatchie Hwy 51 Emergency Sewer Line Replacement, Bid No. 179821.71.0405" in the subject line and mailed (or e-mailed) to the attention of Brad Davis, Project Manager with a copy to Aaron Kinkelaar, Project Procurement Manager. All requests or questions should be clearly marked and must be received no later than the date and time listed in the Selection Schedule.

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, Carter-Malone Group, 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, 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 SARP10 Registration process.

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 SARP10.

Event	Completed By
RFB Advertising Date, RFB available, Vendor Registration for Prequalification Open	June 1, 2015
Mandatory Pre-Bid Meeting	June 3, 2015



Event	Completed By
Last date for Receipt of Bidder's Questions, Registration for Prequalification Information Deadline	June 4, 2015
Issue Final Addendum for answers to questions	June 5, 2015
Receive all Bids	June 8, 2015 by 3:00pm local time
Public Opening	June 8, 2015 immediately following receipt of bids
Public Notice of Award	June 9, 2015
Preconstruction Meeting with Subcontractor	June 19, 2015
Tentative Notice to Proceed	June 22, 2015

00170.17 Mandatory Pre-Bid Meeting

A mandatory pre-bid meeting will be held from **10:00 A.M to 11:30 A.M (local time)** at **SARP10 Office, 3485 Poplar Ave, Suite 230, Memphis, TN 38111** on **June 3, 2015**. Bidders are required to attend the pre-bid meeting at their cost, and must contact the Purchaser prior to the pre-bid meeting in order to coordinate their attendance.

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 bid. 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 bid is valid for one hundred eighty calendar days after the Bid Due Date (the "Bid Validity Period"). If you indicate "No" in Article 00370.4.4, provide the number of calendar days that your bid is valid in Article 00370.4.4 and declare an exception in accordance with Article 00270.6. Purchaser may reject your bid without prior notice if your bid 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 bid 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 bid 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 bid.

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 Subcontractor.

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 (10 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.			
DUN'S #			
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 acknowledges receipt and inclusion of the following Addenda to the RFB - Yes/No		Bidder Response Column	
	Addenda Number	Date Issued	Received and Incorporated
00370.3 Bid Pricing Information			
00370.3.1 Bid Prices		See Attached Pricing Table 00370.3.1	
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. - Yes/No	
1st License Title	
in State/Province of	
License Number	
2nd License Title	
in State/Province of	
License Number	
00370.4.3 Not Used	
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. - Yes/No	
If no, Bidder's bid is valid for indicated days from bid due date. - No. Days	
00370.4.5 Firm Non-Escalatable Pricing	Bidder Response Column
All of Bidder's prices herein bid are firm and are non-escalatable. - Yes/No	
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. - Yes/No	
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	
Bidder has accounted for all Jobsite existing and controlling conditions and limitations which may affect the Work performance and the Bidder's Bid. - Yes/No If No, explanation is included in Exception.	
Bidder proposes that it will perform all the Work at the Jobsite with its own forces. - Yes/No	
Bidder has indicated proposed sub-subcontracted Work in attached Table 00370.4.7. - Yes/No	
Bidder has provided proposed Small Business/Minority/Disadvantaged Entrepreneur Participation Plan with its bid. - Yes/No	
00370.5 Schedule Compliance	
Bidder agrees to meet the schedule dates indicated in the RFB documents: - Yes/No	
If No, explanation is included in Exception.	
If No, Bidder has completed and submitted an attached alternative summary level schedule: - Yes/No	
00370.6 Compliance with Request for Bid	
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. - Yes/No	
00370.6.1 Exceptions	
Bidder certifies that its bid complies with all RFB commercial and technical requirements except for the following:	Bidder Response Column
Bid is based on acceptance of all commercial requirements of this RFB. - Yes/No	
If No, all Commercial Exceptions have been accurately defined and identified as "Commercial Exceptions" on the Purchaser provided and Bidder attached Exceptions Form: - Yes/No	
Bid is based on acceptance of all technical requirements of this RFB. - Yes/No	
If No, all Technical Exceptions have been accurately defined and identified as "Technical Exceptions" on the Purchaser provided and Bidder attached Exceptions Form. - Yes/No	

00370.6.2 Clarifications		Bidder Response Column
Bidder certifies that its bid complies with all RFB commercial and technical requirements without clarification. - Yes/No		
If No, all Commercial Clarifications have been accurately defined and identified as "Commercial Clarifications" on the Purchaser provided and Bidder attached Clarification Form. - Yes/No		
If No, all Technical Clarification have been accurately defined and identified as "Technical Clarifications" on the Purchaser provided and Bidder attached Clarification Form. - Yes/No		
00370.7 Bid Attachments		Bidder Response Column
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:		
(Attachment 1)		
(Attachment 2)		
(Attachment 3)		
(Attachment 4)		
(Attachment 5) (Add additional lines as needed)		
00370.8 Declarations		Bidder Response Column
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. - Yes/No		
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. - Yes/No		

Table 00370.3.1 - Unit Price 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.					
Bid Submitted by (Company Name)					
00370.3 Bid Pricing Information					
00370.3.1 Unit Pricing					
<p>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.</p>					
<p>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.</p>					
00370.3.1.1 Unit Prices				Bidder Response Columns	
Item Number	Item Description	Measure	Estimated Quantity	Unit Price	Extension Price
00001	Mobilization	LS	1		
00003-6.01	Light Cleaning & Mainline CCTV Inspection	LF	6595		
02530-6.01	Site Preparation and Restoration	LS	1		
02530-6.02	Undercut Backfill	Ton	900		
02530-6.04	Pavement Backfill	Ton	3500		
02530-6.07.16.42	Glass Fiber Reinforced Polymer Mortar Pipe	LF	6020		
02530-6.19.01.84	Sewer in Jacked Liner	LF	575		
02530-6.22	Removal of Existing Pipe	LF	5545		
02530-6.23	Abandonment of Existing Pipe	LF	1050		
02530-6.25	Allowance of Property Restoration	LS	1	\$ 20,000.00	
02530-6.26	Dewatering for the Installation of Sewer Pipe	LF	6020		
02530-6.27	Traffic Control	LS	1		
02530-6.28	Type 3 Silt Fencing	LF	14000		
02531-6.01.06	6' Diameter Standard Depth Precast Concrete Manhole	EA	16		
02531-6.02	6' Diameter Extra Depth Precast Concrete Manhole Vertical Foot	VF	317		
02531-6.06	Sewer Manhole Rim and Cover	EA	16		
02531-6.10	Dewatering for Manhole Installation	EA	16		
02531-6.14	Abandonment of Existing Manhole	EA	2		
02920-5.01	Seeding (with mulch)	Unit of 1000 SF	480		
02950-01.01	3" Asphalt Concrete Removal and Replacement	SY	330		
	100% Performance and Payment Bonds	Lot	1	\$ -	\$ -
Total Estimated Unit Price Value				\$ -	
<p>Note the Subcontractor shall provide documentation to determine compensated cost per each manhole adjustment using the rates described above.</p>					

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 the Work after issuance of the Notice to Proceed.	120 Calendar Days after NTP	Yes	

*LD indicate 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: TBD							
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 Days	Event			
00370.8.1 Commercial Submittals							
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	00572	Lien Waivers and Report of Disadvantaged Business Enterprise Participation Form		With	Each Invoice		
C04	00572	Final Lien Waivers from Subcontractor and Sub-subcontractors and Sub-subcontractors and Report of Disadvantaged Business Enterprise Participation Form		With	Final Invoice		
C05	00571	Final Payment Invoice and Report of Disadvantaged Business Enterprise Participation Form	45	After	Issuance of the Notice Of Final Completion and Acceptance		
C06	00572	Contractor Licenses	14	Before	Mobilization Onsite		
C07	00572	Written Notice and Supporting Documentation, of all Claims	10	After	Occurrence of Event Giving Rise to the Claim		
C08	00572	Insurance Certificates for Purchaser Approval		Prior to	Mobilization		
C09	00572	Initial Issue Subcontractor's Work Execution Schedule	30	After	Effective Date		
C10	00571	Subcontractor Actual Man-hours Expended and Quantities Installed	Weekly	After	Mobilization Onsite		
C11	00575	Subcontractor's Daily Report	Daily	After	Mobilization Onsite		
C12	00575	Signed Daily Reports		Daily	After Mobilization Onsite		
C13	00575	Weekly Coordination Meeting Agenda Input	Weekly	Prior to	Weekly Coordination Meeting		
C14	00575	Subcontractor's Safety, Health and Accident Prevention Program		Prior to	Mobilization Onsite		
C15	00575	Subcontractor's Hazardous Waste Project Health and Safety Plan		Prior to	Mobilization Onsite		
C16	00575	Safety and Health Representative Resume		Prior to	Assignment and Mobilization		
C17	00575	Verification of meeting Hazardous Waste Requirements of 29CFR1910.120	5	Prior to	Mobilization Onsite		
C18	00575	Hazardous Materials Documentation		With	Each Hazmat Shipment		
C19	00575	Safety and Health Records	Monthly	After	Mobilization Onsite		
C20	00575	Evidence that Jobsite Personnel have Passed Drug Testing	10	Prior to	Mobilization Onsite		
C21	Loss Control Manual	Fall Protection Plan	5	Prior to	Starting Work Operations		
C22	Loss Control Manual	Chemical Hazard Communication Plan, as applicable	5	Prior to	Mobilization Onsite		
C23	Loss Control Manual	Substance Abuse Program	5	Prior to	Mobilization Onsite		
C24	00672.4	W-9 of Subcontractor and Sub-subcontractors also include Contact Information for each including email and address		With	Bid		
C25	00672.3	Certificate of Nondiscrimination for Subcontractor and Sub-subcontractors		With	Bid		
C26	00672.4	Equal Business Opportunity Program Compliance Form for Subcontractor and Sub-subcontractors		With	Bid		
C27	00672.4	M/WBE Certificates for both Subcontractor and Sub-subcontractors as applicable		With	Bid		

00370.8 Schedule of Submittals							Bidder Agrees? Yes/No
Effective Date: TBD							
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 Days	Event			
C28	00170	Bid Bonds		With	Bid		
C29	00571	Security Instruments		10	Effective Date		

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
Cc: Gary Older
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
179821.71.0405

Addressed to Subcontractor:

[[subcontractor entity]]
[[street address]]
[[city, state, zip code]]
Attention:
179821.71.0405

Electronic Commercial Correspondence (excluding invoices)

Addressed to Purchaser:

To: Aaron Kinkelaar
KinkelaarAB@bv.com
To: Brad Davis
DavisBJ@bv.com

Addressed to Subcontractor:

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

Non-Electronic Commercial Correspondence (excluding invoices)

Addressed to Purchaser:

Black & Veatch
8400 Ward Parkway
Kansas City, MO 64114
Attention: Aaron Kinkelaar
179821.71.0405

Addressed to Subcontractor:

[[subcontractor entity]]
[[street address]]
[[city, state, zip code]]
Attention:
179821.71.0405



Electronic Invoices

Prior to Invoice submission to BVAPMarkView@bv.com, Subcontractor will send a copy to OlderGS@bv.com, DavisBJ@bv.com and ChenJ2@bv.com for review and approval. Once approved, Subcontractor will be notified to submit the Invoice to BVAPMarkView@bv.com. Subcontractor shall utilize the A1A form, available upon request.

Original Invoice:

To: Overland Contracting Inc.

BVAPMarkView@bv.com

Fax (866) 941-9458

Attention: BVAP

179821.71.0405

With a Copy to:

To: Julia Chen

ChenJ2@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 dollars (\$500.00) 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.

"Construction Schedule" means the detailed network schedule developed by Purchaser.

"Contractor" as referenced in Technical Specifications means Subcontractor.

"Effective Date" means the date on which Purchaser releases Subcontractor to proceed with all or part of the Work, whether the release occurs under a written notice to proceed issued prior to execution of this Subcontract or by execution of this Subcontract.

"Engineer" as referenced in Technical Specifications means Purchaser.

"Final Completion" means for each Notice to Proceed: (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.

"Parties" means Purchaser and Subcontractor.

"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

"Specifications" means Purchaser's documents describing the technical and other requirements of the Work, and the codes, standards, or specifications referenced in the documents.

"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.

"Subcontract Price" means the total compensation to be paid to Subcontractor under this Subcontract.

"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.

"Technical Specifications" has the same meaning as "Specifications."

"US" or "USA" means the United States of America.

"Warranty Period" means a one year period of time after Final Completion is achieved, as may be extended pursuant to Article 00572.10.

"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 Subcontractor 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 from Purchaser for any Sub-subcontractor that will be performing any portion of the Work at the Jobsite, as outlined in Article 00575.10. 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 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 Living Wage Ordinance, 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 Living Wage Ordinance:



The Prime Agreement is subject to Living Wage Ordinance #5185 as amended by Ordinance #5257 (effective July 1, 2008) that requires contractors who enter into a service contract with the City of Memphis to pay employees who work under the service contract a living wage. The minimum hourly wage shall be at least \$10.27 per hour with health benefits for employees and their dependents or \$12.32 per hour without health benefits. Subcontractor is also subject this ordinance as a subcontractor of Purchaser performing services. Subcontractor will submit certified payrolls as required by the ordinance to Purchaser, and Purchaser will forward to Owner. Copies of the ordinances are posted on Owner's website (www.memphistn.gov). Once on the homepage, click on the "Business" link, and then click on "Doing Business with the City" link. A link to the ordinance will be on the top right side under the section "Links". Annual adjustments to the rates will be posted on the site for the next year in February. Davis Bacon rates shall apply only if they are higher than the City of Memphis Living Wage Ordinance. Also if the Subcontract price is higher than \$500,000.00 the City of Memphis Prevailing Wage Rates applies unless the rates are lower than the Davis Bacon rates and then Davis Bacon rates would apply.

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 without the explicit written consent of the 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.

00572.13 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 five 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. Subcontractor, however, shall proceed with the change as directed in a written Work authorization pending such agreement.

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 Not Used

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 the 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.

00572.22 Audit

Purchaser reserves the right to audit the records of Subcontractor.

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. Subcontractor must include training, Master Job Hazard Analysis (JHA) and daily JSAs.

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. Purchaser must approve sub-tier subcontractors prior to mobilization to the jobsite.

00575.3 Hazardous Waste Project Health and Safety Plan

00575.3.1 Subcontractor understands that the Work may involve 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 matters 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 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.

00575.10 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.

00672 - General Conditions Attachments

00672.1 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,

SARP10 Program 179821.71.0405 Project

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 origin 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 00270.9.

Subcontractor's Name

Date

Signature

Printed or Typed Name and Title

**THIS FORM MUST BE SUBMITTED WITH THE BID OR THE BID MAY BE CONSIDERED
NONCONFORMING**

00672.4 Equal Business Opportunity Program

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

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 Goals for this project is a minimum of **2.6%** MBE and a minimum of **2.6%** WBE (as identified by the Tennessee Uniform Certification Program list, other State or Federal DBE lists, or the City of Memphis EBO list).

Additionally, 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 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 M/WBE participation goal for this solicitation is 15%. The percentage of M/WBE participation (as identified on the City of Memphis EBO list only) is defined as the dollar value of subcontracts awarded to certified minority and/or women business enterprises divided by the total proposed base bid amount.

DBE SRF Fair Share Goals:

MBE minimum **2.6%**

WBE minimum **2.6%**

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

SARP10 MBE/WBE Participation Goal:

MBE and or WBE minimum **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 DBE and/or M/WBE participation; and (3) the names of the DBE and/or M/WBE 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 SARP10 MBE/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 DBE 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



MINORITY/WOMEN BUSINESS ENTERPRISE COMPLIANCE FORM (1 page)



SUBCONTRACT TITLE: 179821.71.0405 Old Loosahatchie Hwy 51 Emergency Sewer Line Replacement

Project M/WBE Goal: Executive Order 11625 and SRF Fair Share Goals:
 MBE minimum **2.6%**
 WBE minimum **2.6%**
 (TNUCP DBE List)

SARP10 DBE Participation Goal:
 DBE minimum **15%**
 (City of Memphis EBO List)

The following sections must be completed by Bidder. A certified Sub-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 (check all that apply if on both lists)

_____ MBE _____ WBE _____ DBE

Section B - Identify below those certified firms that will be employed as Sub-subcontractors or suppliers on this Project. By submitting this Bid, 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 Bid

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

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

\$ _____ % _____ = **Total MBE**

\$ _____ % _____ = **Total WBE**

\$ _____ % _____ = **Total DBE**

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

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



00672.6 State Revolving Fund (SRF) Front-Ends (56 pages)

This Project 179821.71.0405 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 13 of 56 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:
(Please also include a signed form from each Sub-subcontractor as applicable refer to Table 00370.8 Schedule of Submittals)

1. Certification Regarding Debarment (page 2 of 56)
2. Certification Regarding Equal Employment Opportunity (page 3 of 56)
3. EPA Form 6100-3 (page 21-22 of 56)
4. EPA Form 6100-4 (page 23-24 of 56)

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
DBE-Guidance Document	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
DBE Form 6100-2 Contractor Receipt Letter	06_DBE06_Form6100_2_ContractorReceiptLtr.pdf
DBE Form 6100-2 Subcontractor Participation	06_DBE07_Form6100_2_SubcontractorParticipation.pdf
DBE Form 6100-3 Subcontractor Performance	06_DBE08_Form6100_3_SubcontractorPerformance.pdf
DBE Form 6100-4 Subcontractor Utilization	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 statutes 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}

Ms. Marilyn Robinson, Executive Director
Nashville Minority Business Office
1919 Charlotte Avenue, Suite 310
Nashville, TN 37203
(615) 255-0432

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 from FY 2010 (or later) EPA Capitalization Grant Funds. The loan recipient must be in compliance with all applicable Davis-Bacon Act requirements.

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 Ms. Marilyn Robinson at the Nashville Minority Business Center office listed above to review bidding/contract documents. Qualified Disadvantaged Business Enterprises (DBE) firms may also 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 Loan Recipient must be notified in writing by its Prime Contractor prior to any termination of a DBE Subcontractor for convenience by the Prime Contractor .	Termination of a DBE Subcontractor for convenience by the Prime Contractor	Prime Contractor	Loan Recipient
A Loan Recipient must require its Prime Contractor to pay its Subcontractor for satisfactory performance no more than 30 days from the Prime Contractor's receipt of payment from the Loan Recipient .	DBE Subcontractor's satisfactory performance	Loan Recipient Prime Contractor	DBE Subcontractor
If a DBE Subcontractor fails to complete work under the subcontract for any reason, the Loan Recipient must require the Prime Contractor to employ the Six Good Faith Efforts (see Table below) if soliciting a replacement Subcontractor .	DBE Subcontractor fails to complete work under the subcontract for any reason and will be replaced	Loan Recipient Prime Contractor	SRF Loan Program
A Loan Recipient must require its Prime Contractor to employ the Six Good Faith Efforts (see Table below) even if the Prime Contractor has achieved its fair share objectives.	Employment of the Six Good Faith Efforts	Loan Recipient Prime Contractor	SRF Loan Program
Inclusion, completion, and/or transmittal of required DBE Forms as instructed below: Loan Recipient Requirements Bidder Requirements DBE Participation/Certification Summary Advertisement for Bids and Publisher's Affidavit 10 Certified Letters and Return Receipts to certified DBEs Good Faith Letter Prime Contractor's Notice Letter for EPA Form 6100-2 EPA Form 6100-2 EPA Form 6100-3 EPA Form 6100-4	---	Loan Recipient Prime Contractor DBE Subcontractor	See instructions below and on Forms

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

GUIDANCE DOCUMENT

SIX GOOD FAITH EFFORTS—www.epa.gov	
PURPOSE	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.
Definitions	
EFFORT 1	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.
EFFORT 2	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.
EFFORT 3	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.
EFFORT 4	Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
EFFORT 5	Use the services and assistance of the Small Business Administration (SBA) and the Minority Business Development Agency of the Department of Commerce.
EFFORT 6	If the Prime Contractor awards subcontracts, require the Prime Contractor 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

DBE FORMS FOR SRF LOANS AWARDED AFTER MAY 27, 2008—www.epa.gov				
Form	Requirement	Provided By:	Completed By:	Submitted To:
List of certified DBE contractors, subcontractors, supplies vendors, equipment vendors, and service providers	Keep list with project files/information for duration of project	SRF Loan Program	---	---
Loan Recipient's Requirements regarding DBEs	Include this information sheet in the Information for Bidders section of bid documents	SRF Loan Program	---	To be included in the contract specifications book
Bidder's Requirements regarding DBEs	Include this information sheet in the Information for Bidders section of bid documents	SRF Loan Program	---	To be included in the contract specifications book
Loan Recipient's Certification and Summary of DBE Participation	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.	SRF Loan Program	Loan Recipient	SRF Loan Program
Advertisement for Bids and Publisher's Affidavit	DBE 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 DBE language is supplied to the Loan Recipient by the SRF Loan Program	Loan Recipient	A copy of the actual advertisement and a Publisher's Affidavit will be submitted to the SRF Loan Program as part of the Authority-to-Award/Bid Package documents
10 Certified Letters and Return Receipts 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 Loan Recipient's DBE Participation and Certification Summary Form.	Prime Contractor and/or Loan Recipient	Loan Recipient	SRF Loan Program as part of the Authority-to-Award/Bid Package documents
Good Faith Letter	If no DBE participation is obtained for the contract, the "Good Faith" letter must be written.	Form letter provided by the SRF Loan Program	Loan Recipient	SRF Loan Program

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

GUIDANCE DOCUMENT

DBE FORMS FOR SRF LOANS AWARDED AFTER MAY 27, 2008—www.epa.gov				
Form	Requirement	Provided By:	Completed By:	Submitted To:
Prime Contractor's Notice Letter for EPA Form 6100-2	The Prime Contractor must submit the Notice Letter to verify that Form 6100-2 was supplied to all DBE Subcontractors participating in the contract.	SRF Loan Program	Prime Contractor	Loan Recipient for inclusion in the Authority-to-Award / Bid / Proposal package
EPA Form 6100-2	Loan Recipient required to have Prime Contractors provide form to DBE Subcontractors 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.	Loan Recipient Prime Contractors	DBE Subcontractors	EPA DBE Coordinator at the conclusion of DBE Subcontractor participation in the project (Address on Form)
EPA Form 6100-3	Loan Recipient required to have Prime Contractors provide form to DBE Subcontractors 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 .	Loan Recipient	Prime Contractors DBE Subcontractors	Loan Recipient for inclusion in the Authority-to-Award / Bid / Proposal package
EPA Form 6100-4	Loan Recipient required to have Prime Contractors complete the form This form captures the Prime Contractor's intended use of an identified DBE Subcontractor and the estimated dollar amount of the subcontract.	Loan Recipient	Prime Contractors	Loan Recipient for inclusion in the Authority-to-Award / Bid / Proposal package

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

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, 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, 12th 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.*

STATE REVOLVING FUND LOAN PROGRAM

Contractor Receipt Letter – Form 6100-2

(Please Insert on Contractor 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, 12th Floor
Nashville, TN 37243

RE: Receipt and Distribution of EPA Form 6100-2
Disadvantaged Business Enterprise (DBE) Participation
(City/County/UD/Authority) (???) County, Tennessee
Loan No. SRF/CWA/CGA/DWF/DWA/DGA 20??-??
(Contract Name and/or Number)

Dear Dr. Sami:

This letter is to inform you the EPA Form 6100-2 was received from the **(City/County/UD/Authority)** and was then given to all DBE Subcontractors as required who are going to provide either construction, services, supplies, or equipment for this project.

If you have any questions concerning this notification, please contact us at **(Phone No., e-mail, etc.)**.

Sincerely,

(Contractors Authorized Representative)

(Title)

cc: **(Consulting Engineer for the contract)**
(City/County/UD/Authority's Authorized Representative)

Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Participation Form

An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE¹ subcontractor² the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

Subcontractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity:	

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Amount Received by Prime Contractor

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Performance Form

This form is intended to capture the DBE¹ subcontractor's² description of work to be performed and the price of the work submitted to the prime contractor. An EPA Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractor's bid or proposal package.

Subcontractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity:	

Contract Item Number	Description of Work Submitted to the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor
DBE Certified By: ___ DOT ___ SBA ___ Other: _____		Meets/ exceeds EPA certification standards? ___ YES ___ NO ___ Unknown

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Performance Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

Subcontractor Signature	Print Name
Title	Date

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Utilization Form

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE¹ subcontractors² and the estimated dollar amount of each subcontract. An EPA Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Issuing/Funding Entity:			

I have identified potential DBE certified subcontractors	__ YES	__ NO	
If yes, please complete the table below. If no, please explain:			
Subcontractor Name/ Company Name	Company Address/ Phone/ Email	Est. Dollar Amt	Currently DBE Certified?

Continue on back if needed

¹ A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

² Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

**Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Utilization Form**

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

TENNESSEE DEPARTMENT OF TRANSPORTATION (TDOT)

Certified Disadvantaged Business Enterprises (DBE) List

Below is the link to the Tennessee Department of Transportation (TDOT) Web Page for the Certified DBE List. This certified list is periodically updated by TDOT.

Here is the link: <http://www.tdot.state.tn.us/dbedirectinternet/Vendor.aspx>

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						
			\$			\$
			\$			\$
			\$			\$
ADDITIONAL CLASSIFICATIONS (HUD Form 4230-A)						
WORK CLASSIFICATION	BASIC HOURLY RATE	FRINGE BENEFITS	TOTAL HOURLY WAGE RATE	DATE OF HUD SUBMISSION TO DOL	DATE OF DOL APPROVAL	
			\$			
			\$			
			\$			
			\$			

>
 General Decision Number: TN140135 02/07/2014 TN135

Superseded General Decision Number: TN20130135

State: Tennessee

Construction Type: Heavy
 Including Water and Sewer Line Construction

County: Shelby County in Tennessee.

HEAVY CONSTRUCTION PROJECTS (including sewer/water construction).

Modification Number	Publication Date
0	01/03/2014
1	02/07/2014

ELEC0474-015 01/07/2013

	Rates	Fringes
ELECTRICIAN.....	\$ 24.30	11.46

* ENGI0369-012 05/01/2013

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

LABO0386-001 05/01/2013

	Rates	Fringes
LABORER: Common or General.....	\$ 15.60	5.35

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

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)).

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 union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows 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. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

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

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 and www.wdol.gov/.

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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.

(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.

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(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

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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

STATE REVOLVING FUND LOAN PROGRAM

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.

STATE REVOLVING FUND LOAN PROGRAM

(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 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 and 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.

(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.

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(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:

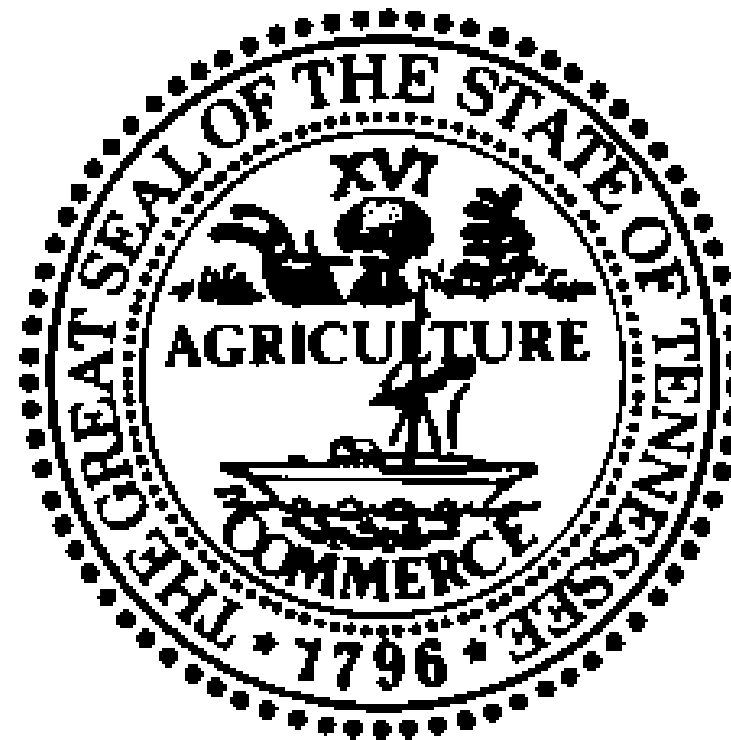
- Achieving and maintaining compliance with the Davis Bacon provisions of ARRA
- Submitting with each **pay estimate** a certification stating that workers have been paid the current prevailing wage rates for each classification according to the Davis-Bacon wage rate schedule currently in effect for 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 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, Existing NPDES Tracking Number, Street Address or Location, Site Activity Description, County(ies), MS4 Jurisdiction, Receiving waters, Attach the SWPPP with the NOI, Site Owner/Developer Entity, Site Owner/Developer Signatory, Mailing Address, Optional Contact, Owner or Developer Certification, Contractor(s) Certification, Other Contractor company name.

OFFICIAL STATE USE ONLY

Form 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 (TNR10000)

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.

Acres Disturbed	= or > 150 acres	= or > 50 < 150 acres	= or > 5 < 50 acres	= or > 1 < 5 acres
Fee	\$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

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.

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

Name of Permittee Requesting Termination of Coverage:			
Permittee Contact Name:		Title or Position:	
Mailing Address:		City:	State: Zip:
Phone: ()		E-mail:	

Check the reason(s) for termination of permit coverage:

<input type="checkbox"/>	Stormwater discharge associated with construction activity is no longer occurring and the permitted area has a uniform 70% permanent vegetative cover OR has equivalent measures such as rip rap or geotextiles, in areas not covered with impervious surfaces.
<input type="checkbox"/>	You are no longer the operator at the construction site (i.e., termination of site-wide, primary or secondary permittee coverage).

Certification and Signature: (must be signed by president, vice-president or equivalent ranking elected official)

<p>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.</p> <p>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.</p> <p>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.</p>		
Permittee name (print or type):	Signature:	Date:

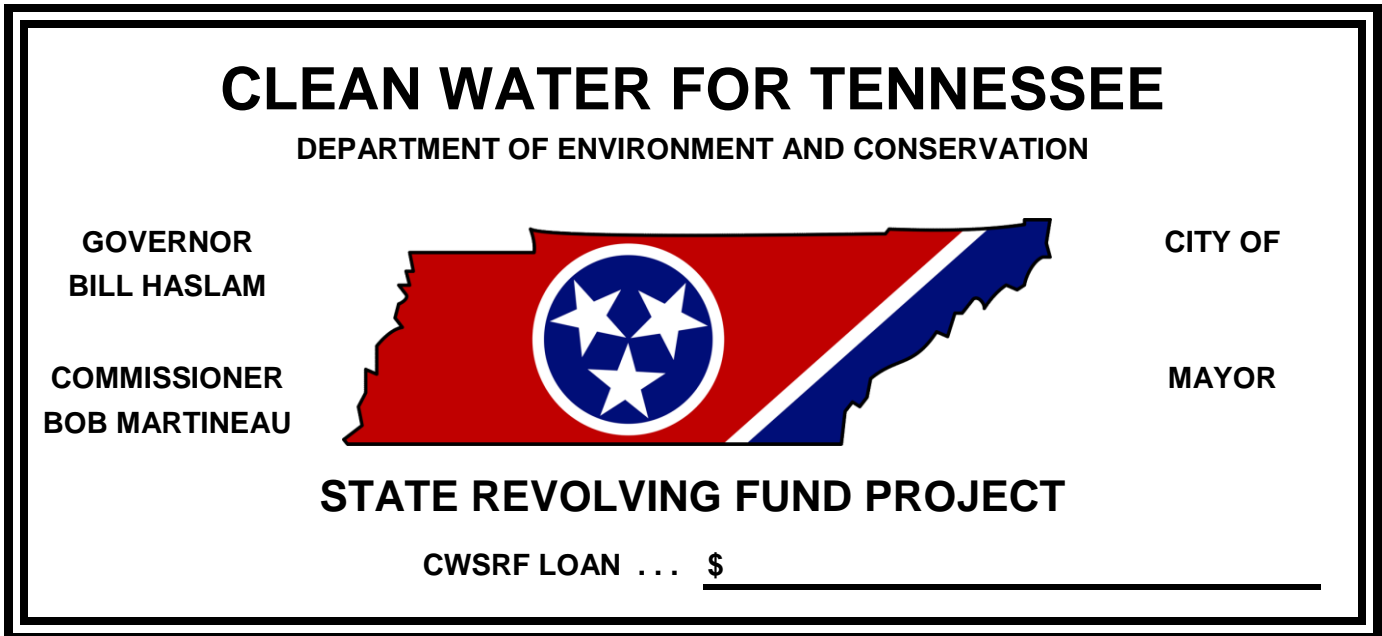
EFO	Street Address	Zip Code	EFO	Street Address	Zip Code
Memphis	8383 Wolf Lake Drive, Bartlett, TN	38133	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Drive	38305	Chattanooga	540 McCallie Avenue STE 550	37402
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
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 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, 12th 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 _____, 2015.

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:

SARP 10 Program 179821.71.0405 Old Loosahatchie Hwy 51 Emergency Sewer Line Replacement

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

Printed or Typed Name



00672.8 Schedule Impact Due to Weather

Program Manager will determine Subcontractor's entitlement to an extension of the Contract Time 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 the Program Manager 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 2003-2013**

Table 1

Average Precipitation by Month (In Inches)											
Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
4.14	3.79	4.49	5.54	6.30	2.52	4.19	3.23	3.01	3.79	4.27	4.87

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	5	5	5	5	3	4	3	3	4	5	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 the Program Manager, and shall state the extension requested and be supported by the relevant weather data.

00770 – Loss Control Manual

The Loss Control Manual is available for viewing at the SARP10 Program Office:

Contact Project Safety Manager Mark McKeon to schedule an appointment:

mckeonmp@Overlandcontracting.com or phone: 203-668-5035



Technical Specifications

Project plans are to be reviewed at:
<http://www.memphistn.gov/Government/PublicWorks/UpcomingProjects.aspx>

**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.

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- 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.
 - 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, and cleaning 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 compliant CCTV sewer segment inspections of existing sanitary sewer mains and connections shall be specifically designed and manufactured for the purpose intended under this Contract. The software and hardware for the electronic

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capture of the inspection defects and recorded observations must be Version 6.0.1 NASSCO PACP 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.
 - 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 MS ACCESS 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

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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.
 - 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.

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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.
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

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.

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1. 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.
2. 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.
3. 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 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.

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- 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.

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.

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

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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.
 - i. 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.
- l. 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

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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

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

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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.
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

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- 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.
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

The Contractor shall provide a dated manifest of the volume or weight of the dewatered sewer cleaning loads taken and dumped at the permitted

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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

In the digital PACP V.6.0.1 compliant format, the Contractor shall provide the following information:

1. 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.
2. 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 instructions, naming conventions, file structures, etc. will be provided after contract award.
 - a. 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

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

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1. Reports:

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:

The Draft Final Report will contain electronic and hard copies of each of the PACP CCTV 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.

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

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

F. Quality

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

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Light cleaning and mainline CCTV inspection shall be measured by linear foot by each diameter of mainline sewer inspected and documented in accordance with the specification.

5.02 HEAVY CLEANING

Heavy cleaning shall be measured by linear foot of each diameter of heavy cleaning approved by the Program Manager and documented.

PART 6 – PAYMENT

6.01 MAINLINE CCTV INSPECTION

Light cleaning and mainline CCTV inspection shall be paid for at the unit price for each linear foot of each diameter inspected and documented in accordance with the specification.

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.

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.

6.02 HEAVY CLEANING

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.

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,

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materials, and equipment necessary to clean mainline sufficiently to allow video reviewers a clear picture of pipe conditions.

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 PAYMENT WILL BE MADE UNDER:

<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

END OF SECTION 00003

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PART 1 - SCOPE

1.01 This Work will consist of the construction of sanitary sewers, siphons, and service connections of the kinds and dimensions shown on the Plans, stipulated in the Contract Documents, or as directed by the Engineer. 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 Engineer. The Contractor will perform all work necessary to complete the Contract with the best modern practice. Without specifications that state the quality of any work, the Contractor is required to perform such items using first-quality construction. Unless otherwise provided, the Contractor will furnish all material, equipment, tools, labor and incidentals necessary to complete the Work.

1.02 The Engineer may change the Plans, Specifications, character of work or quantity of work, provided the cost of the changes does not exceed 10% of the contract price.

PART 2 – MATERIALS AND EQUIPMENT

2.01 MATERIAL

A. Construction Material

1. All material furnished by the Contractor 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 Contractor may substitute a higher strength pipe of the same type as that specified subject to the approval of the Engineer.

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 Contractor will be subject to approval by the Engineer. No material will be delivered until the manufacturer and product have been approved by the Engineer. 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 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 Contractor will furnish the Engineer 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 Contractor.

2. The Contractor will notify the Engineer before any deliveries of material and will make whatever provisions are necessary to aid the Engineer in the inspection and culling of the material before installation.

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E. Storage

1. The Contractor 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. 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 Engineer.

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 or greater, 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 Engineer.
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) Pipe and Fittings (8-15 inch Diameter)

1. All PVC 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 PVC. The wall thicknesses of the waterway and bell of molded 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 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 Engineer. The City 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 Engineer 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 Engineer.

L. Glass Fiber Reinforced Polymer Mortar Pipe and Fittings (36-72 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.

4. Resin Systems: These shall be only polyester resin systems with a proven history of

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satisfactory performance in sewage application. 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 Engineer, 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 Engineer 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 Engineer.

- 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.

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 polyethylene pipe grade resin to a

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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 200 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.

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.

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

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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.

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:

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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 Engineer, a connection of sanitary sewer pipes (6 inches through 15 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 Engineer, 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 Engineer.

V. Portland Cement Concrete

1. Portland Cement Concrete will be of the class and dimensions shown on the Plans, or as directed by the Engineer. 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"	3/8"	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 Engineer.

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 Engineer, 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 Engineer, 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 Contractor may be required to furnish the Engineer 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 Engineer 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 Engineer 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. New Material and Methods

1. The City encourages development of new products and technology and will consider the use of products or methods not previously specified. Product submittals will be reviewed by the City Engineer and a determination will be made as to the acceptability of the product. Consideration or review of a new product does not mean the City will accept its use on the Project.

2.02 EQUIPMENT

A. The Contractor 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 Engineer 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 Contractor for construction of sanitary sewer facilities. The Contractor will confine his construction activities to these areas. The Contractor 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 Contractor will immediately provide a copy of all such written agreements to the City upon obtaining the same.

B. Clearing of Rights-of-Way and Easements

1. The Contractor will confine his clearing of rights-of-way and easements to the least area necessary for construction of facilities shown on the Plans. The Contractor will protect as many trees and shrubs within the area as possible. Where necessary for construction the Contractor 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 Contractor will be removed and replaced in their original state or protected by the Contractor at no additional cost to the City.

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D. Removal of Obstructions

1. The Contractor 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 Contractor 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 Contractor'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 Contractor 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 Contractor. 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. If burning of debris is allowed by the Engineer all precautions will be exercised to prevent the spread of fire and such burning will be according Specification Section 01740 Paragraph 1.06. Burning will be done only at approved locations and in conformity with the laws, ordinances and requirements of agencies and officials having jurisdiction. Besides obtaining the permission of the Engineer, the Contractor will obtain and pay for any permits required. When material is to be disposed of outside the easement, the Contractor 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 Engineer. Unless otherwise provided in the Contract Documents, the Contractor 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, and appearance to the removed fence. Exceptions to this requirement will be allowed if written releases are obtained from the property owners by the Contractor and submitted to the Engineer. For chain link fence, new fence material and construction methods will conform to the requirements of Specification Section 02820.

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. Areas where sod is only slightly damaged may be reseeded if so permitted by the

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Engineer. 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 Engineer. Seeding and sodding material and construction methods will conform to the requirements of Specification Sections 02920 and 02921.

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 Engineer.

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 Engineer. In special cases the Engineer may limit the distance to which the trench may be opened by notifying the Contractor 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 15 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 Contractor'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 City of Memphis Standard SST-3 and to the satisfaction of the Engineer 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 Engineer. The limits of undercut excavation will be determined by the Engineer who will be present during the undercut operations.

2. Undercut areas will be backfilled with No. 67 limestone or other aggregate approved by the Engineer to the grade established on the Plans. 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 Test (ASTM D 698).

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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 Contractor'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 Engineer 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 Engineer, 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 Engineer at the written request of the Contractor, the Contractor will not receive any additional compensation for the changed work. Backfilling and restoration of abandoned excavation work will be accomplished totally at the Contractor's expense. If changes requested by the Contractor 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 Contractor 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 Contractor shall comply with all applicable OSHA regulations and City of Memphis Stormwater Ordinances.

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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 Contractor. If the Contractor 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 Contractor in advance. A certified copy will be given to the Engineer. No surplus or excess material will be deposited in any stream channel nor anywhere that would change preconstruction surface drainage.

F. Control of Water

1. The Contractor 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 Contractor'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 contractor. Dewatering of trenches, will be incidental to trench excavation. The Contractor will avoid producing mud in the trench bottom by his operations. If necessary or so ordered by the Engineer, the Contractor 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 bedding, 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 Engineer.

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 Engineer.

G. Excavation Around Obstructions

1. The Contractor 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 Contractor 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 Contractor will be responsible for performing the Work according to the lines and elevations shown on the Plans or as directed by the Engineer. The Contractor 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 Contractor 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.

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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 Engineer so direct.

2. Sheeting and Shoring:

The Contractor 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 Contractor will place this sheeting and shoring without the Engineer'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, bedding, 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 Engineer permits the material to be left in place. The Contractor 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 Contractor 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 Engineer. 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 Contractor 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 Engineer. The contractor 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.

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8. **Blasting:**

Blasting will be undertaken only after the Contractor has received written authorization from the Engineer. With respect to the use of explosives in blasting, the Contractor 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 Contractor will obtain additional insurance covering the use of explosives with limits and coverage as specified by the Engineer. 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 Contractor 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 Contractor will advise the Engineer 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 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 Contractor 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 Contractor from making such removal and filling the extra space. The Contractor will not be entitled to extra compensation therefore.

11. **Underpinning:**

When excavations require underpinning of existing structures, the Contractor will submit shop drawings of underpinning details to the Engineer for review before commencement of excavation below the foundation of the structure. Review of underpinning details by the Engineer will not relieve the Contractor 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 City 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 Contractor's responsibility to arrange for the relocation with the owner or owners of the utilities.

2. **Protection**

The Contractor will protect any storm drain, sewer, or utility within the limits of the construction. The Contractor 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 City 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 Contractor's operations. All water and gas pipes and other conduits near or crossing the excavation will be properly supported and protected by the Contractor.

3. If the construction requires the removal and replacement of any overhead wires or poles, underground pipes, conduits, structures or other facilities, the Contractor will arrange for such work with the Owner or Owners of the facilities. No additional payment will be made by the City for this work.

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4. Service Connections:

Sewer and utility services between mains and buildings will be maintained and adjusted as necessary by the Contractor to provide as nearly a continuous operation as can be expected. This will be accomplished in any way that the Contractor chooses, provided the individual service is not interrupted for more than two consecutive hours. The occupants will be notified by the Contractor at least six hours before such service interruptions. When a break occurs, the Contractor 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 Contractor'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 Contractor's responsibility from the sewer main to a point where the new grade and existing grade can be matched.

8. The Contractor will be responsible for any damage to the sewer house connection because of his operations. The Engineer 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 bedding will be constructed as shown on the Plans. It will be the Contractor's responsibility to find all underground utilities before construction to insure there are no conflicts with the proposed line and grade. The Contractor'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 Engineer immediately. If approved by the Engineer, 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 Contractor 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 City.

B. Modifications of Existing Sanitary Sewer Facilities

1. Maintenance of Flow:

Where existing sewer lines are being modified, the Contractor 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 contractor 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.

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3. The Contractor will be allowed to remove pipe to be abandoned if wanted. If the Contractor elects the removal method, all associated costs will be included in the cost for other Pay items.

4. Connection to Existing Manholes:

The Contractor 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 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 Contractor. The City reserves the right to retain or reject salvage of any material encountered. All remaining material becomes the property of the Contractor who will be responsible for properly disposing of the same.

3.04 PIPE BEDDING

A. Bedding will be defined as that material supporting, surrounding and extending to one foot above the top of the pipe. Bedding for sewer pipe will conform to the requirements given below for Class A, B.1, B.2, or C bedding, whichever is shown on the Plans. If the class of bedding is not shown, a minimum of Class B.1 or B.2 bedding will be provided as specified below. At the direction of the engineer or as shown on the plans, sewer pipe and Class B.1 or B.2 bedding will be encapsulated in geotextile fabric as specified in Section 02370 2.01.C.

B. Class A - Concrete Cradle

1. Class A bedding 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 Engineer. Class A bedding will only be used for rigid pipe.

C. Class B.1-Crushed Limestone

1. Class B.1 bedding will be number 67 crushed limestone. Pipe 4 inches to 24 inches in diameter will be bedded on 4 inches of bedding material. Pipe larger than 24 inches in diameter will be bedded on 6 inches of bedding material. 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 bedding.

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D. Class B.2-Crushed Limestone

1. Class B.2 bedding will be number 67 crushed limestone. Pipe 4 inches to 24 inches in diameter will be bedded on 4 inches of number 67 crushed limestone. Pipe larger than 24 inches in diameter will be bedded on 6 inches of bedding material. 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 bedding will be used for all flexible pipe including fiberglass reinforced polymer mortar pipe and PVC.

E. Class C-Sand

1. Class C bedding will only be used when specified by the Engineer 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.

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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 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 Engineer.

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 Contractor 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 Contractor 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 Contractor will make a request to the Engineer and receive approval of 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 Contractor.

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 Engineer. 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.

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M. Valves

1. Valves and appurtenant fittings will be installed as shown on the Plans or where directed by the Engineer.
2. Check valves and gate valves will be installed on either flanged or mechanical joint ductile iron pipe.
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 Engineer.

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.

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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 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 Engineer. These special joints will be installed as specified by the manufacturer. The length of the pipe to be restrained will be determined by the Engineer 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.

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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 Contractor, subject to approval by the Engineer. 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 Engineer. Building connections will be laid on no less than a 1 percent grade for 6 inch diameter connections unless otherwise directed by the Engineer. Each building connection will be accurately recorded by station offset and depth on the as-built drawings and will be furnished to the Engineer. Unless authorized by the Engineer 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 Engineer. 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 Engineer. 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 15" and smaller.

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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 Engineer. 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 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" 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 Contractor will construct cofferdams, temporary bulkheads, perform all pumping and other work necessary to protect the siphon during construction. The Contractor 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, bedding, 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.

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3.11 BACKFILLING

A. General

1. After sanitary sewer facilities have been bedded and installed according to these Specifications and upon permission of the Engineer, 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 Contractor will be responsible for the condition of the trenches and filled areas during the contract and warranty period. The Contractor 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 Contractor 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 Engineer orders, will be made with pit run gravel or other acceptable material as approved by the Engineer. The backfill will be from the top of the bedding material or 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 bedding 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

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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 12 inch 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:

When the masonry or concrete work has set sufficiently to withstand compaction, and the Engineer 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 in open areas and unimproved property will be made with select material from the top level of bedding 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.

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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. Before spreading excess soil, the Contractor 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 Engineer. 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 Contractor.

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 Engineer. 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 Contractor will submit shop drawings detailing the method, equipment and material to be used for tunneling, boring and jacking operations to the Engineer for review and approval. The approval by the Engineer of any drawings or plans will not in any way be deemed to release the Contractor 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.

3. The Contractor 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 Contractor 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 Contractor's expense. All cost and expense to the Contractor 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 Contractor 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 Contractor 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 Contractor 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.

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2. The Contractor will furnish, place, and maintain all sheeting, bracing, lining or casing required to support the tunnel until the pipe and its bedding, jointing, encasement, and backfilling have been completed. All liners will remain in place.
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 bedding 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 Contractor 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.

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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 Contractor requests and receives authorization from the Engineer to leave it in place. No payment will be made for items left in place at the Contractor's option. If the Plans or the Engineer 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 Specification Section 02530.6.

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 Engineer 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. 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. After placing the assembled pipe in the bored hole, the ends will be blocked to secure the proper flow line elevations at each end and to insure the placing of grout at the bottom and sides of the pipe. If necessary or required, a skid or shoe will be provided for the pipe bells to permit flow of grout beneath the pipe and to prevent sagging and pockets along the pipe flow line. 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 spaces between the liner and the exterior of the pipe will be filled solidly with grout placed under mechanical pressure. Before placing grout, the carrier pipe will be carefully inspected for uniformity of grade along its alignment and any required corrections made. Particular attention will be given to insuring that the pipe will be solidly supported by grout at its bottom and sides. The method of injection of grout under mechanical pressure will be approved by the Engineer. Grout will consist of a mixture of 1 part cement to 7 parts sand by volume and a minimum amount of water necessary for proper placing. Grout will be placed by inserting the grout pipe to its greatest distance to insure filling all spaces and then gradually withdrawing the pipe as filling proceeds. For carrier pipe less than 18 inches in diameter, the above procedures will be used except that pipe will be laid on the bottom of the liner and skids or shoes are not required at the pipe bells. Grouting will be placed for only 2 feet at each end of the liner pipe.

6. When unforeseen obstructions or conditions require abandonment of a partially completed bore hole, and the starting of a new hole, the Contractor will grout the abandoned bore hole solid. The Contractor will receive no compensation for any expenses incurred by any unsuccessful attempt.

D. Jacking

1. The Contractor will furnish for the Engineer'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 Engineer will not relieve the Contractor from his responsibility to obtain the specified results.

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2. Heavy duty jacks suitable for forcing the pipe through the embankment will be provided by the Contractor. 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 Contractor 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 Contractor 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 Contractor will provide, at his own expense, thicker walled lines if necessary to withstand the forces of jacking. In any case, the Contractor will retain full responsibility for the adequacy of this jacking operation, equipment and material.

F. Reserved.

3.13 DELETED

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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 Contractor will remove all debris and foreign material.

PART 4 - FINAL TESTING AND ACCEPTANCE

4.01 VISUAL INSPECTION

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 Contractor who will provide necessary equipment for testing and lamping the system in the presence of and under the supervision and instructions of the Engineer. Lamp tests will be observed first hand by the Engineer. 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 Engineer 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" and smaller than 48" in diameter. All pipe over 48" in diameter will have individual joint testing according to Specification Section 02530 Paragraph 4.02.E. The method of testing used by the Contractor will be subject to approval by the Engineer. The Contractor 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" 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.

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3. An initial test must be arranged by the Contractor 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 Engineer exceeds 0 gallons per inch of internal diameter per mile of sewer per day, the Contractor will find the point(s) of leakage and will make necessary repairs and then retest the same reach. The Contractor will submit his plans for repair to the Engineer for his review.

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 Contractor.

C. Air Leakage Test for 6"-24" Diameter Pipe

1. Upon completion of construction, or earlier if the Engineer deems advisable, the Contractor 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 Engineer 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" 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 Engineer 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.

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Time Required for a 1.0 psig Pressure Drop for Size and Length of Pipe Indicated ¹

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

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 Contractor to reduce the infiltration in such portions of the line tested. The passing of an infiltration test will in no way relieve the Contractor 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 Contractor'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.

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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. The mandrel will be pulled freely by hand through the pipe from manhole to manhole. No pipe deflection will exceed 5%. Any section failing the test will be repaired by re-bedding or pipe replacement and retested to the satisfaction of the Engineer.

C. The cost of this service will be included in the unit price bid for the pipe.

4.04 SEWAGE FORCE MAINS

A. The Contractor 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 Contractor will furnish and install test plugs at no additional cost, including all anchors, braces and other devices to withstand hydrostatic pressure on plugs. The Contractor 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

$$P_{pt} = 0.650 (OP-GE), \text{ in which}$$

P_{pt} = 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:

$$P_{lt} = 0.433 (OP-GE), \text{ in which}$$

P_{lt} = 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

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4.05 FINAL ACCEPTANCE

A. When all work required by the Contract has been completed, the Contractor shall submit to the Engineer 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 Contractor, the Engineer will make a final inspection of the Work, including any tests for operation. After completion of this inspection the Engineer will, if all things are satisfactory to him, issue to the Contractor 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 Contractor or his sureties from any guarantees under the Contract or the Performance Bond. Upon receipt of the Certificate of Completion the Contractor 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 in acres unless otherwise directed by the Engineer.

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 Contractor under other contract items.

5.02 UNDERCUT BACKFILL

A. Undercut backfill will be measured by the ton of limestone in place.

5.03 SHEETING AND SHORING DIRECTED TO REMAIN IN PLACE

A. Sheeting and shoring directed to remain in place will be measured by the 1,000 board feet, in place, after being cut off below grade. Sheeting and shoring placed and removed by the Contractor or left in place at the request of the Contractor will not be measured for payment.

5.04 PAVEMENT BACKFILL

A. Pit run gravel or other acceptable material used for backfill under pavements or other areas directed by the Engineer will be measured by the ton of material in place.

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 Contractor 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 Contractor under other Pay Items of the Contract.

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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 Engineer.

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 shown on the Plans to the end of the force main at its discharge location. Shut-off and relief valves and pits, and thrust blocks are incidental to the construction of the force main and/or pump station and will not be measured for payment.

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 NON-SHRINKING GROUT

A. Non-shrinking grout for general use as indicated on the plans or as directed by the Engineer will be measured by the cubic yard, complete in place for each type used.

5.13 PLAIN CONCRETE FOR GENERAL USE

A. Concrete for general use including but not limited to pipe bedding, encasement, collars, and thrust blocks at the locations shown on the Plans or directed by the Engineer will be measured per cubic yard, complete in place for each class used.

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5.14 REINFORCED CONCRETE

A. Reinforced concrete including but not limited to pipe encasement, collars, and thrust blocks, at the locations shown on the Plans or directed by the Engineer 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, 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 liner plate or without liner plate.

B. If Contractor 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.

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 Contractor 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 Contractor 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 Contractor 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.

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02530 SEWER PIPE INSTALLATION

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 Engineer; 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 Engineer.

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 SHEETING AND SHORING DIRECTED TO REMAIN IN PLACE

A. Accepted quantities of sheeting and shoring directed by the Engineer to remain in place will be paid for at the contract unit price per 1,000 board feet in place after being cut off below grade, which will be full compensation for material only. The cost of placing sheeting and shoring to remain in place will be included in the unit cost of other items. No payment will be made for sheeting and shoring placed and removed by the Contractor or left in place upon request of the Contractor.

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 Engineer 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

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, bedding, 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.

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02530 SEWER PIPE INSTALLATION

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, bedding, 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, bedding, 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 NON-SHRINKING GROUT

A. The accepted quantities of non-shrinking grout for general use will be paid for at the contract unit price per cubic yard, complete in place for each type used, which will be full compensation for material, testing, etc. necessary for the satisfactory completion of the work.

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, collars, and thrust blocks 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.

6.14 REINFORCED CONCRETE

A. The accepted quantities of reinforced concrete including but not limited to pipe encasement, collars, and thrust blocks 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.

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02530 SEWER PIPE INSTALLATION

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, 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.

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.

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02530 SEWER PIPE INSTALLATION

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
02530-6.03	SHEETING AND SHORING DIRECTED TO REMAIN IN PLACE	1,000 Board Feet
02530-6.04	PAVEMENT BACKFILL	Ton
02530-6.04.01	Sand Backfill	Ton
02530-6.04.02	Pit Run Gravel Backfill	Ton
02530-6.05	SERVICE CONNECTION REMOVAL AND REPLACEMENT	EA
02530-6.05._____	Type Service Connection	EA
02530-6.07	SEWER PIPE	Linear Foot
02530-6.07.01.____	_____ " Prestressed Concrete Cylinder Pipe	LF
02530-6.07.02.____	_____ " Reinforced Concrete Pipe, Class II	LF
02530-6.07.03.____	_____ " Reinforced Concrete Pipe, Class III	LF
02530-6.07.04.____	_____ " Reinforced Concrete Pipe, Class IV	LF
02530-6.07.05.____	_____ " Reinforced Concrete Pipe, Class V	LF
02530-6.07.06.____	_____ " Ductile Iron Pipe, Class 50	LF
02530-6.07.07.____	_____ " Ductile Iron Pipe, Class 51	LF
02530-6.07.08.____	_____ " Ductile Iron Pipe, Class 52	LF
02530-6.07.09.____	_____ " Ductile Iron Pipe, Class 53	LF
02530-6.07.10.____	_____ " Ductile Iron Pipe, Class 54	LF
02530-6.07.11.____	_____ " Ductile Iron Pipe, Class 55	LF
02530-6.07.12.____	_____ " Ductile Iron Pipe, Class 56	LF
02530-6.07.13	DELETED	
02530-6.07.14	DELETED	
02530-6.07.15.____	_____ " Polyvinyl Chloride (PVC) Pipe	LF
02530-6.07.16.____	_____ " Glass Fiber Reinforced Polymer Mortar Pipe	LF
02530-6.09	FORCE MAIN	LF
02530-6.09.01.____	_____ " Ductile Iron Force Main, Class 50	LF
02530-6.09.02.____	_____ " Ductile Iron Force Main, Class 51	LF
02530-6.09.03.____	_____ " Ductile Iron Force Main, Class 52	LF
02530-6.09.04.____	_____ " Ductile Iron Force Main, Class 53	LF
02530-6.09.05.____	_____ " Ductile Iron Force Main, Class 54	LF
02530-6.09.06.____	_____ " Ductile Iron Force Main, Class 55	LF
02530-6.09.07.____	_____ " Ductile Iron Force Main, Class 56	LF
02530-6.09.08.____	_____ " Polyvinyl Chloride (PVC) Force Main, Class 200	LF
02530-6.09.09.____	_____ " High Density Polyethylene Force Main	LF
02530-6.11	SERVICE CONNECTION	LF
02530-6.12	NON-SHRINKING GROUT	CY
02530-6.12.01	Non-shrinking grout, Type I	CY
02530-6.12.02	Non-shrinking, fast setting grout, Type II	CY
02530-6.13	PLAIN CONCRETE FOR GENERAL USE	CY
02530-6.13.01	Plain concrete for general use, Class A	CY
02530-6.13.02	Plain concrete for general use, Class C	CY
02530-6.14	REINFORCED CONCRETE FOR GENERAL USE	CY
02530-6.15	INVERTED SIPHON	Lump Sum
02530-6.16	SEWER IN EARTH TUNNEL	LF
02530-6.16.01._____	"Sewer in Earth Tunnel With Liner Plate"	LF
02530-6.16.02._____	"Sewer in Earth Tunnel Without Liner Plate"	LF
02530-6.17	SEWER IN BORED HOLE	LF
02530-6.17.01._____	"Sewer in Bored Hole With Liner Pipe"	LF
02530-6.17.02._____	"Sewer in Bored Hole Without Liner Pipe"	LF
02530-6.17.03.	Reserved	

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02530 SEWER PIPE INSTALLATION

02530-6.18	JACKED SEWER	LF
02530-6.18.01	_____ "Jacked Sewer"	LF
02530-6.19	SEWER IN JACKED LINER	LF
02530-6.19.01	_____ "Sewer in Jacked Liner"	LF
02530-6.22	REMOVAL OF EXISTING PIPE	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

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02531 MANHOLES AND SPECIAL STRUCTURES

PART 1 - SCOPE

1.01 This work consists of the construction of manholes and special structures for sanitary sewers of the type and dimensions shown on the Plans, stipulated in the Contract Documents, or as directed by the Engineer. The construction will be accomplished according to these Specifications and Plans or as established by the Engineer. The Contractor will perform all work necessary to complete the Contract with the best modern practice. Unless otherwise provided, the Contractor is required to furnish all labor, material, equipment and other items necessary to complete the manholes and structures as shown on the Plans.

PART 2 - MATERIALS AND EQUIPMENT

2.01 MATERIAL

A. Construction Material

1. All material furnished by the Contractor 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.

B. Qualifications of Manufacturers

1. Manholes 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 Engineer. No material will be delivered until the manufacturer and product have been approved by the Engineer.

C. 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 Contractor will furnish the Engineer 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 structure delivered to the project will show the laboratory's stamp. The performance or cost of all testing is the responsibility of the Contractor.

2. The Contractor will notify the Engineer before any deliveries of material and will make whatever provisions are necessary to aid the Engineer in the inspection and culling of the material before installation.

D. Storage

1. The contractor will provide storage facilities and exercise measures that will maintain the specified quality and fitness of materials to be incorporated in the work.

E. Portland Cement Concrete

1. Portland cement concrete will be as designated in Specification Section 02530 Paragraph 2.01.V.

F. Steel Reinforcement

1. Deformed steel reinforcing bars and welded wire fabric will be as shown on the Plans or as directed by the Engineer. All steel reinforcement will be as specified in Specification Section 03310.

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02531 MANHOLES AND SPECIAL STRUCTURES

G. Mortar

1. Mortar will be as designated in Specification Section 02530 Paragraph 2.01.Y.

H. Brick

1. All brick will be as designated in Specification Section 02530 Paragraph 2.01.BB.
2. No new brick manholes are to be allowed in the City of Memphis system. This specification is included for repair of existing brick manholes and incidental use of brick for leveling courses in new construction.

I. Gray Iron Castings

1. Castings will be of the standard Memphis type as detailed on the Plans and Design Standards. Castings will be made of good quality, even grained cast iron and will be smooth and free from scale, lumps, blisters, sand-holes, and defects of any nature that would render them unfit for the service for which they are intended. They will be thoroughly cleaned and subjected to a careful hammer inspection.
2. Castings will meet the requirements of ASTM A 48, Class No. 35, or Grade 65-45-12 ductile iron meeting the requirements of ASTM A 536. Manhole rims and covers will be designed to withstand HS-20-44 loading defined in the AASHTO Specifications. Rims and covers will be machined or ground at touching surfaces to seat firmly and prevent rocking. Any set not matching will be removed and replaced at no additional cost.

J. Manhole Steps

1. Steps are not allowed in sewer structures.

K. Precast Concrete Manhole Sections, Bases and Other Structures

1. All precast reinforced concrete manhole risers, cones, grade rings, and flat slab tops will conform to the requirements of ASTM C 478 for the specified diameter and strength class. All cone sections and transition sections will be eccentric. Barrel sections will be custom made with openings to meet indicated pipe alignment and invert elevations. The Contractor will submit shop drawings for each typical structure shown on the Plans for approval by the Engineer. After approval by the Engineer, the Contractor can place the order for structures. The bottom manhole section and pipe(s) will be in place (supported by concrete blocks) before pouring the cast-in-place manhole base. The bottom of all precast base sections and cast-in-place bases 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.
2. For sewer manholes four (4) to six (6) feet in diameter and less than twenty (20) feet deep, precast reinforced concrete manhole base sections shall be a minimum of 8 inches thick. For sewer manholes greater than six (6) feet in diameter or more than twenty (20) feet deep, precast 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 plans. Steel reinforcement shall conform to Specification Section 03310.
3. 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 material.

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02531 MANHOLES AND SPECIAL STRUCTURES

4. Gaskets between manhole sections will be a flexible material meeting the requirements of Federal Specification SS-S-00219 for Type I gaskets and AASHTO M 198 for Type B gaskets unless otherwise specified on the Plans. Joint contact surfaces will be formed with machined castings. Joints between a manhole section and precast concrete flat tops will be mortar joints conforming to the requirements of this Specification. All sewer manholes must pass the Negative Air Pressure (Vacuum) Test as required in Specification Section 02531 Paragraph 4.02.A.
 5. All pump station wet wells and siphon structures shall be lined or coated with a material conforming to either Section 02530 paragraph 2.01.DD or Section 02531 paragraph 2.01.R.
 6. All manholes and structures on pipe 36 inches in diameter and larger shall be lined or coated with a material conforming to either Section 02530 paragraph 2.01.DD or Section 02531 paragraph 2.01.R.
 7. Manhole manufacturer shall install plastic liner as recommended by lining manufacturer.
- L. Sand
1. Sand for structure abandonment will consist of sand or a natural sandy soil, all of which passes a 3/8 inch sieve and not more than 10 percent passes a No. 200 sieve.
- M. Pit Run Gravel
1. Pit run gravel will be as designated in Specification Section 02530 Paragraph 2.01.AA.
- N. Non-Shrinking Grout
1. Non-shrinking grout will be as designated in Specification Section 02530 Paragraph 2.01.CC.
- O. Waterproofing
1. Waterproofing for manhole exteriors will consist of two coats of asphalt or coal tar pitch. Asphalt will conform to the requirements of ASTM D 449. Coal tar pitch will conform to the requirements of ASTM D 450.
- P. 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.

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02531 MANHOLES AND SPECIAL STRUCTURES

5. All surfaces of the completed vent stack and welds will be cleaned and painted. The color of the finish coat will be silver.

Q. Flexible Pipe Connectors to Manholes

1. All connections of pipe to manhole sidewalls will be made with flexible connectors. Openings in the manhole sidewall for the pipe will be precast or cored to provide required size and location. The hole will be manufactured to allow for lateral and vertical movement, and angular adjustments through 20°. A connector between manholes and pipes such as Press-Seal, Kor-N-Seal, or Z-LOK will be installed in the precast or cored opening. The connector will meet the requirements set forth in the latest revision of ASTM C 923. A corrosion resistant, stainless steel external band will be used around the flexible connector to create the external seal around the pipe.

2. Any void between the pipe and connector will be filled with an approved flexible gasket material.

3. Flexible connectors will be considered an integral part of the manhole sidewall, and no separate payment will be allowed.

R. Protective Linings and Coatings

1. All poly vinyl chloride (PVC) protective lining for concrete structures shall conform to Section 02530 Paragraph 2.01.DD.

2. Protective coating for concrete structures will be a calcium aluminate mortar mix such as SewperCoat as manufactured by Lafarge Aluminates, Aluminaliner as manufactured by Quadex Rehabilitation Products, or as approved.

S. Grade Adapter Rings

1. Grade adapter rings shall be the standard Memphis type, compatible with City of Memphis standard rings and covers. Grade adapter rings shall be gray iron castings conforming to paragraph 2.01.I in these specifications.

2.02 EQUIPMENT

A. The Contractor 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 Engineer before work will be permitted to begin.

PART 3 - CONSTRUCTION REQUIREMENTS

3.01 SITE PREPARATION AND RESTORATION

A. Site preparation and restoration for sewer manhole and structure construction will be performed per Specification Section 02530 Paragraph 3.01.

3.02 EARTHWORK

A. Earthwork for sewer manholes and structures will be performed per Specification Section 02530 Paragraph 3.02.

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02531 MANHOLES AND SPECIAL STRUCTURES

3.03 REMOVAL OR ABANDONMENT OF EXISTING MANHOLES AND STRUCTURES

A. Removal

1. Existing manholes and structures to be removed will be shown on the Plans or as directed by the Engineer. 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 Contractor to a City yard as directed by the Engineer. All remaining materials become the property of the Contractor who will be responsible for disposal.
2. The excavation will be backfilled per Specification Section 02530 Paragraph 3.11.

B. Abandonment

1. Existing manholes and structures to be abandoned in place will be shown on the Plans or as identified by the Engineer.
2. After removing manhole and structure rims, covers, and similar items, all pipes will be bulkheaded. The walls will be lowered to 2 feet below final grade if in earth or to 12 inches below subgrade if in a proposed pavement area. The remaining manhole or structure will be filled with sand to the limits previously mentioned.
3. The sand will be placed in approximately 12 inch layers and each layer compacted to 75 percent relative density or 95 percent of maximum density (standard proctor) as applicable. A 12 inch thick plain concrete slab will be installed over the manhole top extending 12 inches beyond the outside face of the manhole.
4. The City reserves the right to retain or reject salvage of any materials encountered. All remaining materials become the property of the Contractor who will be responsible for disposing of same.
5. All manholes that must be removed to perform excavation for the proposed sewer pipe and/or structures will be removed as part of the sewer excavation and no additional payment will be due the Contractor.

3.04 GENERAL CONSTRUCTION REQUIREMENTS

A. New manholes and structures will be constructed of plain or reinforced concrete. Work may include the repairing of brick masonry manholes or structures. Where the top elevation is not shown on the Plans, the manhole or structure will be built to conform to the elevation ordered by the Engineer. Standard depth manholes are those having a depth of 6'-0" from rim to invert of the sewer. Manholes and special structures will be built as the pipe laying progresses. The Engineer, at his discretion may stop the laying of pipe or the building of other manholes until the manhole just passed has been completed. Completion of the manhole will include the installation of fittings, connections to pipes, placing of castings, testing, and other construction as shown on the Plans.

B. Inlet and outlet pipes will extend through the walls of manholes and special structures 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 Plans, Design Standards, or otherwise directed. 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 so 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. All castings, rims, covers and fittings will be placed in the positions shown in the Plans or as directed by the Engineer. Rims on manhole cones will be set concentrically with the top of the cone in a full bed of mortar so that the space between the top of the manhole cone and the bottom flanges of the rim will be filled and made watertight. A ring of mortar at least 1 inch thick and pitched to shed water away from the rim will be placed around the outside of the bottom flange. Mortar will extend to the outer edge of the cone and will be finished smooth and flush with the top of the flange. If rim fittings are to be bolted or anchored in concrete or brick masonry, all anchors or bolts will be set and held in place before the concrete or mortar is placed. The unit will not be disturbed until the mortar or concrete has hardened to adequate strength. Bolt-down manhole covers will be installed at the locations shown on the Plans and all bolts securely tightened following acceptance of the manhole to provide a watertight seal.

E. Vent stacks will be installed on manholes at locations and to the elevations shown on the Plans or as directed by the Engineer. Vent stacks will be installed on flat top manholes only. The vent stack pipe will be positioned in the hole provided in the manhole top and the vent stack support bottom ring will be attached to the concrete manhole top with anchor bolts in drilled holes with expansion sleeves. A vent stack support ring with threaded coupling may be cast in the flat top for installation of the vent stack.

F. Protective Linings and Coatings

1. The contractor shall take all necessary measures to prevent damage to installed lining from equipment and materials used in or taken through the work.
2. Wherever a pipe lateral (not of plastic lined concrete) is installed through a lined concrete manhole, the lining shall be extended over and around the end of the pipe and back into the structure for not less than 4 inches. This protecting cap may be molded or fabricated from the lining material but need not be locked into the pipe.
3. All welding of joints is to be in strict conformance with the specifications and instructions of the lining manufacturer.
4. Welding shall fuse both sheets and weld strip together to provide a continuous joint equal in corrosion resistance and impermeability to the liner plate.
5. Hot-air welding guns shall provide effluent air to the sheets to be joined at a temperature between 500° and 600°F. Welding guns shall be held approximately 0.5 inch from and moved back and forth over the junction of the two materials to be joined. The gun shall be moved slowly enough as the weld progresses to cause a small bead of molten material to be visible along both edges and in front of the weld strip. All welders shall be certified by the manufacturer.
6. Protective coatings shall be installed in strict conformance with the manufacturer's recommendations.

3.05 REPAIRING OF BRICK MANHOLES AND STRUCTURES

A. Where shown on the Plans or directed by the Engineer, the Contractor will repair brick manholes or structures. The work will conform to the applicable portions of Specification Section 02640 Paragraph 3.02.B.1.

3.06 PRECAST CONCRETE CONSTRUCTION

A. Precast concrete manholes will be neatly and accurately built according to the Plans or as directed by the Engineer. All precast manholes will use either a concrete slab constructed of Class A concrete on a 12 inch thick crushed stone foundation and which will be cast integrally with the base

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section and the inlet and outlet pipes as shown on the Plans or the precast manhole will use a precast base section conforming to Specification Section 02531 Paragraph 2.01.K.

1. Precast concrete manhole base sections shall be placed on a 12 inch minimum thickness No. 67 crushed limestone base. The stone base will be fully encapsulated in a geotextile fabric as indicated on the plans or as directed by the Engineer. Geotextile fabric shall conform to Section 02370 paragraph 2.01.C, and grade No. 67 stone shall conform to Section 02530 paragraph 2.01.W.

B. Precast concrete sections will be set so the structure will be vertical and with sections in true alignment. Joint surfaces of the base or previously installed section will have a flexible rubber gasket installed in the recess after being primed with an asphaltic cement material recommended by the manufacturer. Flexible rubber gaskets and primers will not be applied to wet or damp surfaces. Each joint will be completely filled with nonshrinking grout on the inside and outside of the manhole after sections have been placed.

C. All holes in precast sections used for their handling will be thoroughly plugged with nonshrinking grout. The grout will be finished smooth and flush with the interior and exterior manhole wall surfaces.

D. All precast concrete manhole cones will be of eccentric construction as shown on the Plans or Details.

E. If brick masonry is used to adjust manhole rims to grade, the masonry work will be performed according to Specification Section 02640 Paragraph 3.02.B.1.

F. All flat top manhole slabs will be steel reinforced with a minimum thickness of 6 inches. The manhole rim and cover will be placed eccentrically in the slab as shown on the Plans or Details. Waterproofing will be applied per Specification Section 02531 Paragraph 3.09.

3.07 CAST-IN-PLACE CONCRETE CONSTRUCTION

A. All cast-in-place manholes and structures will be built of Class A concrete as shown on the Plans. The manholes and structures will be built on an undisturbed earth foundation and conform to the dimensions, shapes and details shown on the Plans. Concrete construction will conform to the methods, forms, mixture, placement, protection, and curing for concrete per Specification Section 03310.

B. Cast-in-place manholes will be neatly and accurately built according to the Plans or as directed by the Engineer. Wall thicknesses will be as detailed on the Plans but not less than 6 inches thick.

C. All cast-in-place manholes will be of eccentric construction as shown on the Plans. Any required reinforcement will be of the kind, type, and size and will be spaced, bent, and fastened as shown on the Plans.

D. Connection of inlet and outlet pipes will conform to the sizes, alignments, and elevations shown on the Plans. Concrete reinforcement and inlet and outlet pipes will be in place and approved by the Engineer before any concrete is placed. If concrete placement is not continuous, a rubber water stop gasket will be required at each construction joint.

E. The inside and outside surfaces of the manhole or structure walls will receive a Class 1, Ordinary Surface Finish as defined by Specification Section 03310 Paragraph 3.11. Waterproofing will be applied per Specification Section 02531 Paragraph 3.09.

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3.08 MANHOLE DROP CONSTRUCTION

A. Drop Construction for New Manholes

1. Drop construction will be installed for new manholes at the locations shown on the plans and/or as directed by the Engineer. Drop construction will conform to the details shown on the Plans and Design Standards for inside drop construction. If precast manhole construction is used, the manhole sections will be custom made with openings for both the upper and lower inlet pipes. The pipe connections to the manhole sidewalls shall be made with flexible connectors conforming to Specification Section 02531 Paragraph 2.01.Q. Water stops will be installed around pipes as they pass through the sanitary manhole wall. Grout will be finished smooth and flush with the adjoining interior and exterior manhole wall surfaces. If cast-in-place manhole construction is used, the upper and lower inlet pipes will be in place and approved by the Engineer before any concrete being placed. All drop construction will be constructed of either ductile iron pipe with push-on or mechanical joints or PVC pipe conforming to the appropriate section of these Specifications. PVC pipe for drop construction at new manholes will be used only on improved property as defined in Specification Section 02530 Paragraph 3.11.A. On unimproved property the section of inlet pipe making the connection to the manhole at the higher elevation and all fittings and drop pipe shall be ductile iron pipe. Solvent cement joints may be used on PVC for drop construction. Encasement of the outside drop pipe will be constructed of Class C concrete.

B. Drop Construction for Existing Manholes

1. Drop construction will be installed in existing manholes at the locations shown on the plans and/or as directed by the Engineer. Drop construction will conform to the details shown on the Plans and Design Standards for inside drop construction. The Contractor will cut a hole in the manhole wall to permit inserting the inlet pipe at the required flow line elevation, horizontal angle, and slope, and to allow two (2) inches space around the pipe for bedding and filling solidly with nonshrinking grout. Care will be used to avoid unnecessary damage to the existing masonry or concrete.

2. All loose material will be removed from the cut surfaces, which will be completely coated with grout before setting the pipe. Before inserting the pipe and flexible connector, a sufficient thickness of grout will be placed at the bottom and sides of the opening for proper bedding of the pipe. After setting, all spaces around the pipe will be solidly filled with grout and neatly pointed up on the inside to present a smooth joint, flush with the inner and outer wall surface. Any necessary modifications to the existing invert will be made to provide a smooth, plastered surface for properly channeled sewage flow from the new connection. All drop construction will be constructed of either ductile iron pipe with push-on or mechanical joints or PVC pipe conforming to the appropriate section of these Specifications. Solvent cement joints may be used on PVC for drop construction. The vertical drop construction will have the dead weight held by suitable means until the steel support straps are secured in place and tightened. The pipe mechanical joint bolts, if used, will not be positioned against the manhole wall. The steel support straps will be fastened to the manhole wall with two bolts per strap set in expansion sleeves in drilled holes.

3.09 WATERPROOFING

A. After the manhole masonry and concrete construction are complete, the exterior surface of each manhole wall within the limits shown on the Plans will be given two coats of approved waterproofing material. Total minimum dry film thickness will be 12 mils. Each coat will be applied at a rate not to exceed one gallon per 100 square feet. The waterproofing materials will be applied by brush or low pressure sprayer and according to the instructions of the manufacturer. Time will be allowed between coats to permit sufficient drying so that the application of the second coat does not affect the first coat.

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B. Care will be exercised during backfilling to prevent damage to the waterproofing. Any waterproof coating damaged during backfill operations will be cleaned of all dirt and two coats of waterproofing reapplied as previously specified.

3.10 DEWATERING

A. Contractor shall furnish, install and operate pumps, pipes, appurtenances, and all equipment of sufficient capacity required to remove any groundwater encountered in the excavation. Contractor 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, special structures, pipeline, etc. In some cases, at the City's discretion, dewatering may be measured and paid for as defined in Specification Section 02531 Parts 5 and 6.

3.11 BYPASS PUMPING

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, special structures, pipeline, etc. In some cases, at the City's discretion, bypass pumping may be measured and paid for as defined in Specification Section 02531 Parts 5 and 6.

3.12. ADJUSTMENT OF RIMS AND COVERS

A. Standard adjustment method:

1. Any manhole covers not adjusted and set at final grade by others shall be adjusted by the Contractor. If the cover requires lowering, the manhole rim shall be removed, sufficient upper courses of brick removed, and the rim reset at proper grade by use of cement mortar over the top course of brick remaining.
2. If the cover requires raising, all defective courses of brick shall be removed and the manhole rebuilt to proper grade and the rim reset as described above. The maximum finished collar height as measured from the top of the manhole rim to the beginning of the conical section shall be 18 inches. If the adjustment would require a collar of greater than 18 inches in height, then the existing collar and conical section of the manhole shall be removed, the riser section raised the required amount, the conical section and collar rebuilt and the rim reset at the proper grade.
3. Any changes in grade for manhole covers of precast or poured-in-place manholes shall be as shown on the plans or as directed by the Engineer.

B. Manhole adjustment with adapter rings:

1. For manhole covers to be raised less than or equal to 5 inches and where the total collar height would not exceed 18 inches, manhole adapter rings may be used if approved by the Engineer. Adapter rings may be up to a maximum of 5 inches utilizing no more than one ring. Adapter rings shall be tack welded to the existing rim at a minimum of 4 locations.

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C. Alternate adjustment method:

1. For manhole covers requiring adjustment where Cement Stabilized Aggregate Base (Specification Section 02710.1) or Soil Cement Base (Specification Section 02710.2) is being placed, the Contractor may, at his option, remove manhole rims and covers and adequately seal off the top of the existing manholes below the bottom of the base course prior to the aggregate or soil cementing operations. If this option is exercised, the Contractor shall reference the location of all manholes so sealed off and aggregate or soil cementing operations shall then continue over the entire street. Within 24 hours after the final compaction of a section of roadway or paved area, all manholes located within this section shall be raised to grade by removing a section of the soil or aggregate base a minimum 3 feet square directly over each manhole. The manhole rims and covers shall then be replaced with Class A concrete to the subgrade. If, in the process of adjusting the manhole rims, the Contractor removed a larger section than specified, he shall replace the entire area so removed with Class A concrete at this expense.

3.13 PUMPING STATIONS

A. Pumping stations and force mains will conform to the latest edition of the State of Tennessee Department of Environment and Conservation Division of Water Pollution Control Specification "Design Criteria for Sewage Works." The City will be responsible for providing the secondary electrical service to the top of the utility pole installed by the contractor. The City will also be responsible for any necessary extension of MLG&W water mains necessary to serve the pump stations. The Contractor will be responsible for providing the water service connection from the MLG&W main or meter box to the pump station.

PART 4 - ACCEPTANCE TEST FOR MANHOLES AND STRUCTURES

4.01 VISUAL INSPECTION

A. All work constructed will be subject to visual inspection for faults, defects, or deviations from the Plans and any such deviation or omission will be corrected at once. All tests will be made by the Contractor who will provide necessary equipment for testing and lamping the manhole or structure in the presence of and under the supervision and instructions of the Engineer. Lamp tests will be observed first hand by the Engineer. All defects found will be corrected before conducting leakage tests. Repair methods must be approved by the Engineer.

4.02 MANHOLE LEAKAGE TEST

A. All manholes and special structures will be subjected to a vacuum test as outlined in ASTM C 1244 or as specified. The manhole, including the frame, will be placed under a vacuum of 10 inches Hg (4.9 psig). The manhole will be considered acceptable if the time measured for the vacuum to drop to 9 inches Hg (4.4 psig) is greater than that shown in the table on the following page. Manholes not meeting the vacuum test requirements will be repaired and retested or replaced.

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Minimum Test Times for Various Manhole Diameters

Depth (ft)	Manhole Diameter (ft)				
	4	5	6	7	8
8	20	26	33	42	55
10	25	33	41	51	64
12	30	39	49	66	86
14	35	46	57	74	96
16	40	52	67	87	113
18	45	59	73	95	123
20	50	65	81	105	137
22	55	72	89	116	150
24	59	78	97	126	164
26	64	85	105	137	177
28	69	91	113	147	191
30	74	98	121	157	205

B. The Contractor will be required to furnish all equipment necessary for this test including the manhole sealing apparatus, gauges, pump, plugs and operating personnel. The cost of this work is to be included in the unit bid price for manholes.

4.03 PROTECTIVE LININGS

A. After the manhole or other structure is installed, all surfaces covered with lining, including welds, shall be tested with an approved electrical hole detector (Tinker & Razor Model No. AP-W with power pack) with the instrument set at 20,000 volts minimum. All welds shall be physically tested by a nondestructive probing method. All patches over holes, or repairs to the liner wherever damage has occurred, shall be accomplished in accordance with manufacturer's recommendation.

B. Defective welds will be retested after repairs have been made. Tabs shall be trimmed away neatly by the installer of the liner after the welding strip has passed inspection. Inspection shall be made within 2 days after joint has been completed in order to prevent tearing the projecting weld strip and consequent damage to the liner from equipment and materials used in or taken through the work.

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PART 5 - MEASUREMENT

5.01 STANDARD DEPTH SEWER MANHOLE

A. Standard depth manholes will be measured per each, for the various diameters and types less manhole rim and cover. Standard depth is a manhole depth less than or equal to 6 feet as measured vertically from the top of the manhole rim to the invert of the manhole. No measurement shall be made for protective linings or coatings. Linings and coatings shall be considered incidental to the construction of sewer manholes. No measurement shall be made for any transition slab to switch to 4 feet diameter riser sections from larger diameter bases. No measurement shall be made for flat tops. Transition slabs and flat tops, if used, shall be incidental to the construction of the sewer manhole.

5.02 EXTRA DEPTH SEWER MANHOLE

A. Extra depth manholes will be measured per vertical foot along the vertical centerline of the manhole from a point 6.0 feet above the invert of the manhole to the top of the manhole for the various diameters and types. Only manholes deeper than 6.0 feet will be considered for extra depth measurement. No measurement shall be made for protective linings or coatings. Linings and coatings shall be considered incidental to the construction of extra depth sewer manholes.

5.03 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 standard depth manhole and extra depth construction (if required).

5.04 REPAIR BRICK SEWER MANHOLE AND STRUCTURE

A. Repair of brick manholes and structures will be measured per each.

5.05 SPECIAL SEWER STRUCTURE

A. Special structures will be measured per each including access shafts, but less manhole rim and cover. No measurement of depth will be made. No measurement shall be made for protective linings or coatings. Linings and coatings shall be considered incidental to the construction of the special structure.

5.06 SEWER MANHOLE RIM AND COVER

A. Manhole rims and covers will be measured per each set consisting of one rim and one cover for the various types.

5.07 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.

5.08 SEWER MANHOLE AND STRUCTURE REMOVAL

A. Removal of existing manholes and structures will be measured per each. Removal of existing manholes and structures within the limits of excavation for new sewer facilities will not be measured or paid for separately but will be included in the price of the new sewer facility.

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5.09 SEWER MANHOLE AND STRUCTURE ABANDONMENT

A. Manholes and other sewer structures to be abandoned will be measured for payment per each. Material for backfilling abandoned structures will not be measured.

5.10 DEWATERING

A. Generally, dewatering is considered to be an incidental to the construction of sewer manholes, special structures, pipeline, etc. In some cases, at the City's discretion, dewatering may be measured for payment. If measured for payment, dewatering will be measured by the day, each day that the pumps are in operation and that the contractor is actively working within the excavation being dewatered. If the contractor is not actively working within the excavation, no measurement will be made for dewatering. The actual quantities used will be jointly agreed upon between the City and the contractor.

5.11 BYPASS PUMPING

A. Generally, bypass pumping is considered to be an incidental to the construction of sewer manholes, special structures, pipeline, etc. In some cases, at the City's discretion, bypass pumping may be measured for payment. If measured for payment, bypass pumping will be measured by the day, each day that the pumps are in operation and the contractor is working on the sewer downstream of the bypass. If the contractor is not actively working on the sewer downstream of the bypass, no measurement will be made for bypass pumping. The actual quantities used will be jointly agreed upon between the City and the contractor.

5.12 ADJUSTMENT OF RIMS AND COVERS

A. Standard adjustment method:

1. Standard manhole adjustments will be measured per each manhole rim adjusted to grade.

B. Manhole adjustment with adapter rings:

1. Manhole adjustment with adapter rings will be measured per each manhole rim adjusted to grade.

5.13 PUMPING STATION

A. Pumping station(s) constructed according to Plans and Specifications will be measured per lump sum for each pumping station, complete in place and operational. Included as a part of the pumping station is the water service connection from the MLG&W main shown on the Plans to the pump station(s). The power pole set by the Contractor to receive MLG&W secondary service and all electrical service from the top of the pole to pumping station equipment are included in the lump sum measurement.

PART 6 - PAYMENT

6.01 STANDARD DEPTH SEWER MANHOLE

A. The accepted quantities of standard depth sewer manholes will be paid for at the contract unit price per each, complete in place for the various diameters and types less rim and cover, which will be full compensation for materials and materials testing, excavation, special protection, and curing of concrete, placing and jointing precast sections, transition slabs, flat tops, construction of base slabs, inverts, connection of inlet and outlet pipes, waterproofing, linings or coatings, cleaning and inspection, conducting acceptance tests, removal and/or abandonment of existing pipe, manholes, or structures within the limits of manhole excavation, and backfilling outside of pavement areas.

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02531 MANHOLES AND SPECIAL STRUCTURES

6.02 EXTRA DEPTH SEWER MANHOLE

A. The accepted quantities of extra depth sewer manholes will be paid for at the contract unit price per vertical foot, complete in place for the various diameters and types, which will be full compensation for materials and materials testing, excavation, special protection, placing, protection, and curing of concrete, placing and jointing precast sections, construction of base slab, transition slabs, flat tops, inverts, connection of inlet and outlet pipes, waterproofing, linings or coatings, cleaning and inspection, conducting acceptance tests, removal and/or abandonment of existing pipe, manholes or structures within the limits of excavation, and backfilling outside of pavement areas.

6.03 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).

6.04 REPAIR BRICK SEWER MANHOLE AND STRUCTURE

A. The accepted quantities of repair brick sewer manholes and structures will be paid for at the contract unit price per each, complete according to detail, which will be full compensation for materials and materials testing, excavation, special protection, maintenance of sewage flow during construction, masonry work, plastering, waterproofing, cleaning and inspection, conducting acceptance test, and backfilling outside of pavement areas.

6.05 SPECIAL SEWER STRUCTURE

A. The accepted quantities of special sewer structures will be paid for at the contract unit price per each, complete in place according to detail, which will be full compensation for materials and materials' testing, excavation, special protection, maintenance of sewage flow during construction, placement, curing, and protection of concrete, cleaning and inspection, waterproofing, linings or coatings, conducting acceptance test, and backfilling outside pavement areas.

6.06 SEWER MANHOLE RIM AND 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.

6.07 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.

6.08 SEWER MANHOLE AND STRUCTURE REMOVAL

A. The accepted quantities of sewer manhole and structure removal will be paid for at the contract unit price per each, which price will be full compensation for excavation, special protection, protection of existing utilities, structure removal, disposal of debris, and backfill.

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6.09 SEWER MANHOLE AND STRUCTURE ABANDONMENT

A. Sewer structures to be abandoned will be paid for at the contract unit price per each, which price will be full compensation for preparing the structure for abandonment, sealing connecting pipes, furnishing and placing backfill material, compaction, and handling of salvageable material.

6.10 DEWATERING

A. If measured for payment, the accepted quantities shall be paid for at the contract unit price per day, which shall be full compensation for material, installation, and operation of pumps, pipes, appurtenances, and all equipment of sufficient capacity required to conduct the groundwater away from the construction site and to satisfactorily complete the work.

6.11 BYPASS PUMPING

A. If measured for payment, the accepted quantities of bypass pumping shall be paid for at the contract unit price per day, which shall be full compensation for material, installation, and operation of pumps, pipes, appurtenances, and all equipment of sufficient capacity required to maintain sewage flow around the work area and to satisfactorily complete the work.

6.12 ADJUSTMENT OF RIMS AND COVERS

A. Standard adjustment method:

1. The accepted quantities of manholes adjusted will be paid for at the contract unit price per each for raising or lowering the manhole cover to final grade, which price will be full compensation for furnishing all labor and materials necessary for the complete adjustment of the covers to the satisfaction of the Engineer.

B. Manhole adjustment with adapter rings:

1. The accepted quantities of manholes adjusted by the adapter ring method will be paid for at the contract unit price per each for raising the manhole to final grade, which price will be full compensation for furnishing all labor and materials necessary for the complete adjustment of the cover to the satisfaction of the Engineer.

6.13 PUMPING STATION

A. Payment will be made for pumping station at the contract lump sum price, which will be full compensation for material, structures (i.e., wet and dry wells), equipment and controls, excavation, special protection, maintenance of sewage flow, protection of existing utilities, provision of the water service connection from the MLG&W water main (valve box) to the pumping station, connection to the source of power on the site, connecting a power supply to the pumping station from top of the pole set by the Contractor at pump site, conducting acceptance tests, backfilling, and all items incidental to the construction of a complete, operational pumping station.

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6.14 PAYMENT WILL BE MADE UNDER:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02531-6.01	STANDARD DEPTH SEWER MANHOLE	EA
02531-6.01.01._____Ft.	Diameter Standard Depth Precast Concrete Manhole	EA
02531-6.01.02._____Ft.	Diameter Standard Depth Poured-in-Place Concrete Manhole	EA
02531-6.02	EXTRA DEPTH SEWER MANHOLE	VF
02531-6.02.01._____Ft.	Diameter Extra Depth Precast Concrete Manhole Vertical Foot	VF
02531-6.02.02._____Ft.	Diameter Extra Depth Poured-in-Place Concrete Manhole	VF
02531-6.03	SEWER MANHOLE DROP CONSTRUCTION	VF
02531-6.03.01._____In.	Diameter Drop Construction in New Manhole	VF
02531-6.03.02._____In.	Diameter Drop Construction in Existing Manhole	VF
02531-6.04	REPAIR BRICK SEWER MANHOLE AND STRUCTURES	EA
02531-6.05	SPECIAL STRUCTURE	EA
02531-6.06	SEWER MANHOLE RIM AND COVER	EA
02531-6.06.01	No. 7 Manhole Rim and Cover	EA
02531-6.06.02	Bolted Down Manhole Rim and Cover	EA
02531-6.06.03	No. 6 Manhole Rim and Cover	EA
02531-6.07	VENT STACK	EA
02531-6.08	SEWER MANHOLE AND STRUCTURE REMOVAL	EA
02531-6.09	SEWER MANHOLE AND STRUCTURE ABANDONMENT	EA
02531-6.10	DEWATERING	DAY
02531-6.11	BYPASS PUMPING	DAY
02531-6.12	ADJUSTMENT OF RIMS AND COVERS	EA
02531-6.12.01	Adjustment of rim and cover by standard method	EA
02531-6.12.02	Adjustment of rim and cover with adapter rings	EA
02531-6.13	PUMPING STATION	LS

END OF SECTION 02531

CITY OF MEMPHIS – STANDARD CONSTRUCTION SPECIFICATIONS
SECTION 02920 SEEDING

PART 1 - SCOPE

This work shall consist of furnishing and placing seed, commercial fertilizer, agricultural limestone, erosion control fabric, and mulch material when specified, and of caring for such areas until acceptance, all in accordance with these Specifications, on all newly graded earthen areas that are not to be paved, stabilized, or sodded, unless otherwise indicated on the plans or directed by the Owner.

PART 2 - MATERIALS AND EQUIPMENT

2.01 MATERIALS.

A. Grass Seed.

1. The seed shall meet the requirements of the Tennessee Department of Agriculture and no "Below Standard" seed will be accepted. Grass seed furnished under these Specifications shall be packed in new bags or bags that are sound and not mended.
2. The Contractor shall furnish the Owner a certified laboratory report from an accredited commercial seed laboratory or from a State seed laboratory showing the analysis of the seed to be furnished and approving the seed for purity and germination. The report from an accredited commercial seed laboratory shall be signed by a Senior Member of the Society of Commercial Seed Technologists. At the discretion of the Owner, samples of the seed may be taken for a check against the certified laboratory report. Sampling and testing will be in accordance with the requirements of the Tennessee Department of Agriculture.
3. When a seed group is used, the percentages forming the group shall be as set out below, unless otherwise specified.

<u>Name</u>	<u>Quantity, Percent by Weight</u>
Group A	
Lespedeza (Common or Korean)	20
Sericea Lespedeza	15
Ky. 31 Fescue	40
English Rye	15
White Dutch Clover	5
Weeping Love Grass	5
Group B	
Ky. 31 Fescue	55
Redtop	15
English Rye	20
White Dutch Clover	5
Weeping Love Grass	5
Group C	
Sericea Lespedeza	50
Ky. 31 Fescue	30
English Rye	15
White Dutch Clover	5

4. In mixing or forming "Groups" of seed, they shall be uniformly mixed. "Group" seed shall not be mixed until after each type seed that is used to form the "Group" has been tested and inspected separately and approved for purity and germination. Seed mixed before tests and inspection are made will not be accepted.

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B. Fertilizer.

Manufactured fertilizer shall be a standard commercial fertilizer containing the specified percentages by weight of nitrogen (N), phosphoric acid (P₂O₅) and potash (K₂O). The fertilizer shall be furnished in standard containers with the name, weight, and guaranteed analysis of the contents clearly marked. The containers shall insure proper protection in handling and transporting the fertilizer. All commercial fertilizer shall comply with local, state, and federal fertilizer laws.

C. Agricultural Limestone.

Agricultural limestone shall contain not less than eighty-five (85%) of calcium carbonate and magnesium carbonate combined and shall be crushed so that at least 85 percent will pass the No. 10 mesh sieve and 100 percent will pass the 3/8 inch sieve.

D. Mulch Material.

All mulch material shall be air dried and virtually free of noxious weeds and weed seeds or other materials detrimental to plant growth on the work site or on adjacent agricultural lands. Hay shall be stalks of approved grasses, sedges, or legumes seasoned before baling or loading. Straw shall be stalks of rye, oats, wheat, or other approved grain crops. Both hay and straw shall be suitable for spreading with standard mulch blower equipment. Biodegradable fabric as specified in this section may be used as an alternate to mulch material at the Contractor's option.

E. Inoculants for Legumes.

Inoculants for treating legume seed shall be standard cultures of nitrogen fixing bacteria that are adapted to the particular kind of seed to be treated. The inoculant shall be supplied in convenient containers of a size sufficient to treat the amount of seed to be planted. The label on the container shall indicate the specified legume seed to be inoculated and the date period to be used.

F. Mulch Binder.

Cut back asphalt, Grade RC-70 or RC-250 conforming to AASHTO Specifications shall be used.

G. Water.

Water shall be free from any harmful or objectionable qualities or organisms.

H. Biodegradable Fabric.

1. Biodegradable fabric shall consist of a knitted or bonded construction of yarn with uniform openings interwoven with strips of biodegradable paper. The fabric shall be degradable by exposure to ultraviolet light. The fabric shall be "Hold/Gro" as manufactured by Gulf States Paper Corporation of Tuscaloosa, Alabama, or equal. The fabric shall be furnished in rolls and shall conform to the following requirements:

- a. Roll Widths: 5 feet minimum and 10 feet maximum.
- b. Roll Length: Approximately 360 feet.
- c. Weight: Approximately 0.2 pounds per square yard of fabric.

2. Fabric shall be secured in a place with wood pegs or other biodegradable materials.

3. The manufacturer shall provide moisture proof bags comparable to 4 to 6 mil opaque polyethylene bags for protection of the fabric prior to installation.

2.02 EQUIPMENT.

All equipment necessary for the satisfactory performance of this construction shall be on the project and inspected before work will be permitted to begin.

PART 3 - CONSTRUCTION REQUIREMENTS

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3.01 GENERAL

The Contractor shall notify the Owner at least 48 hours in advance of the time he intends to begin sowing seed and shall not proceed with such work until permission to do so has been granted by the Owner. Before starting seeding operations on any area, final dressing and the placing of topsoil shall have been completed in accordance with the project requirements. All seeding and related operations shall be continuous operations.

3.02 PREPARING THE SEEDBED.

Each area to be seeded shall be scarified, disked, harrowed, raked, or otherwise worked until it has been loosened and pulverized to a depth of not less than one inch. This operation shall be performed only when the soil is in a tillable and workable condition. Fertilizer, at the rate of not less than 23 pounds of Grade 6-12-12 or equivalent, per 1,000 square feet, and agricultural limestone, at the rate of not less than 100 pounds per 1,000 square feet, shall be distributed evenly over the seedbed, unless other are specified on the plans or in the Contract Documents. The limestone and fertilizer shall be lightly harrowed, raked, or otherwise incorporated into the soil as specified above when mixed with seed in water and applied with power sprayer equipment.

3.03 TIME OF SEEDING.

Group "A" seed shall be used for seeding from February 1 to August 1, and Group "B" seed shall be used from August 1 to December 1, except that either Group "A" or "B" may be used during the month of August. Group "C" seed shall be used from February 1 to December 1 and only when specified on the Plans or in the Contract Documents. Seeding shall be performed only when the soil is in a tillable and workable condition, and no seeding shall be performed between December 1 and February 1, unless otherwise permitted.

3.04 SEEDING.

Seed of the specified group shall be sown as soon as preparation of the seedbed has been completed and thoroughly watered after seeding. Care shall be exercised to not wash seeding by over watering. Seed shall be sown uniformly by means of a rotary seeder, wheelbarrow seeders, hydraulic equipment, or other satisfactory means, and unless otherwise specified on the Plans or in the Contract Documents, at the rate of 1 ½ pounds per 1,000 square feet. Group "C" seed and seeds of legumes when sown alone shall be inoculated before sowing in accordance with the recommendations of the manufacturer of the inoculant and as directed by the Owner. No seeding shall be done during windy weather, or when the ground surface is frozen, wet, or otherwise nontillable.

3.05 BIODEGRADABLE FABRIC.

A. When biodegradable fabric is specified, the fabric shall be loosely draped over the seeded area. The seed bed to be covered shall be prepared, fertilized, limed, seeded, and watered prior to installation of the fabric. If the slope is greater than 3 to 1, fabric shall be applied vertically with paper strips oriented parallel to the slope.

B. The Contractor shall dig a 4 inch deep check ditch 1 foot back from the slope crown, then fold, place and peg fabric every 9 inches in the check ditch, and cover with soil. An identical check ditch shall be provided 1 foot away from the bottom of the slope. When 2 or more lengths of fabric are required to be installed side by side to cover an area, they shall overlap 4 inches minimum. Fabric installed end to end shall overlap 4 inches minimum with the upgrade section on top of the lower grade section. End to end overlaps of adjacent rows of fabric shall be staggered a minimum of 5 feet. Each length of fabric shall be pegged in 3 rows, each edge and the center, with pegs placed on 3 foot centers maximum. Overlapped ends shall be pegged on 9 inch centers across the fabric overlap. Pegs shall be driven flush with the ground. The Contractor shall strictly adhere to the installation directions provided by the manufacturer of the fabric.

C. The Contractor shall maintain and protect the biodegradable fabric until Final Acceptance or until the Owner has determined that the fabric has served its useful life, whichever occurs first. Maintenance shall consist of watering as required, repairs made necessary by erosion, wind, fire, or any other cause until Final Acceptance. Following the restoration of damaged areas under plant establishment requirements for applicable underlying items, the fabric shall be repaired or replaced to

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meet the original requirements and maintained until Final Acceptance of the Project.

3.06 MULCHING.

When seeding with mulch is specified, the mulch material shall be spread evenly over the seeded areas at an approximate rate of 75 pounds per 1,000 square feet immediately following the seeding operations. This rate may be varied by the Owner, depending on the texture and condition of the mulch material and the characteristics of the area seeded. All portions of the seeded areas shall be covered with a uniform layer of mulch, so that approximately 25 percent of the ground is visible. The mulch shall be held in place by the use of an approved mulch binder. Cutback asphalt or emulsified asphalt shall be applied at the approximate rate of 4 gallons per 1,000 square feet as required to hold the mulch in place. Mulch in medians and other areas affected by traffic shall be held in place by applying asphalt binder at the approximate rate of 11 gallons per unit. The Contractor shall cover exposed structures, guardrails, signs, and appurtenances, if the mulch binder is applied in such a way that it would come in contact with or discolor the structures.

3.07 MAINTENANCE AND REPAIR.

All seeded areas shall be cared for and maintained properly to the Owner's satisfaction until Final Acceptance of the Work and for the duration of the warranty period. Such care shall include, but not be limited to watering as necessary, fertilizing, and mowing the seeded areas when required by the Owner. When mowing is required, mower blades shall be set at sufficient height to protect the vitality of the growth. Areas which have been previously seeded and mulched in accordance with this Specification Section but which have been eroded, damaged or failed to successfully establish a stand of grasses or legumes shall be repaired as directed by the Owner. All material and labor required to maintain and repair seeded areas shall be furnished by the Contractor at no cost to the City. If the Owner directs the Contractor to place additional fertilizer on the area to be reseeded, and additional 4 pounds of agricultural limestone will be required for each additional pound of fertilizer.

PART 4 – MEASUREMENT

The furnishing of seeding as specified herein may be incidental to the work of the Contract, or may be measured and payment made under the Pay Items described herein, as defined by the Pay Items in the Proposal Sheet(s) and/or as included in the Plans and Contract Documents. If payment is made separately, measurement for the work of this Specification will be as described below.

4.01 SEEDING (WITH MULCH).

The area of seeding (with mulch) to be measured for payment will be the number of seeding units, with mulch, in accordance with these Specifications. Each unit will consist of 1,000 square feet measured along the surface.

4.02 SEEDING (WITHOUT MULCH).

The area of seeding (without mulch) to be measured for payment will be the number of seeding units in accordance with these Specifications. Each unit will consist of 1,000 square feet measured along the surface.

4.03 BIODEGRADABLE FABRIC.

Biodegradable fabric to be measured for payment will be the number of 1,000 square foot units for which biodegradable fabric has been applied over seeded areas. Measurement will be along the surface.

4.04 GENERAL.

All work and materials for seed bed preparation, application of fertilizer and limestone, application of mulch binder, watering and maintenance and repair of work, and all other similar items included in this section of the Specifications but not covered by a Pay Item herein will be considered as a subsidiary obligation of the Contractor under other items of the Contract.

PART 5 – PAYMENT

5.01 SEEDING (WITH MULCH).

Seeding (with mulch) will be paid for at the contract unit price per unit (1,000 square feet), for the accepted quantities, which price will be full payment for preparing the seedbed, and for furnishing and placing all materials including fertilizer, water, agricultural limestone, seed, mulch materials, mulch binder and inoculant,

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complete in place; and for maintenance and repair of the seeded and grassed area.

5.02 SEEDING (WITHOUT MULCH).

Seeding (without mulch) will be paid for at the contract unit price per unit (1,000 square feet) for the accepted quantities, which price will be full payment for preparing the seedbed, and for furnishing and placing all materials including fertilizer, water, agricultural limestone, seed, and inoculant, complete in place; and for maintenance and repair of the seeded and grassed areas.

5.03 BIODEGRADABLE FABRIC.

Biodegradable fabric will be paid for at the contract unit price per unit (1,000 square feet) for furnishing, installing, maintaining, and protecting the fabric, which price will be full payment for accomplishing the above.

5.04 PAYMENT WILL BE MADE UNDER:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02920-5.01	SEEDING (WITH MULCH)	Unit of 1,000 SF
02920-5.02	SEEDING (WITHOUT MULCH)	Unit of 1,000 SF
02920-5.03	BIODEGRADABLE FABRIC	Unit of 1,000 SF

END OF SECTION 02920

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PART 1 – SCOPE

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 construction of drainage facilities, sanitary sewers, traffic control conduit, 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 Plans, these Specifications, or as directed by the Owner. The Work which will be included in the Contract and for which the Contractor shall be compensated therefore is limited to that area within the rights-of-way and construction easements for the Project. The Contractor 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: Concrete materials shall meet the requirements of Specification Section 03050, Portland Cement Concrete for Class A concrete.

B. Curing Material: Curing materials shall conform to the applicable provisions of Specification Section 02750 Paragraph 2.01 C.

C. Asphaltic Concrete Wearing Surface and Asphalt Curb: Asphaltic concrete wearing surfaces and asphalt curb shall meet the requirements of Specification Section 02741 Paragraph 2.01 D., "Composition of Mixtures", for Mix No. 1.

D. Asphalt Driveway Pavement: Asphalt driveway pavement shall meet the requirements of Specification Section 02741 Paragraph 2.01 D., "Composition of Mixtures", for Mix No. 2.

E. 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.

F. Gravel Pavement or Base: Camden gravel or crushed limestone meeting the requirements of Specification Section 02720 Paragraph 2.01, Aggregates for Gradation No. 1, 2 or 3 shall be used to replace graveled areas disturbed by construction.

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 Owner.

B. When saws are used to cut pavement, the Contractor 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 Contractor 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.

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E. Equipment necessary for the handling, placement, and finishing of concrete shall meet the applicable requirements of Specification Section 02750 Paragraph 2.02, "Portland Cement Concrete Pavement"; Specification Section 02775 Paragraph 2.02, "Portland Cement Concrete Sidewalks and Driveways"; and Specification Section 02770 Paragraph 2.02, "Curb, Curb and Gutter, and Water Table" .

F. Equipment necessary for the handling, placement, and compaction of asphalt shall meet the requirements of Specification Section 02741 Paragraph 2.02.

PART 3 – CONSTRUCTION REQUIREMENTS

3.01 REMOVAL OF ASPHALT PAVEMENT

Asphalt pavement shall be removed to a clean straight line as detailed on the Plans. Pavement shall be cut by saw or other equipment approved by the Owner 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

A. Concrete pavement shall be removed to a neat straight line as detailed on the Plans. Care shall be used to avoid damage to pavements and to the pavement base remaining in place.

B. Concrete pavement may, at the Contractor's option, be removed by saw cutting to a neat straight line. Saw cuts shall be made to a minimum depth of 1-1/2 inches and at a location to provide a cutback edge in accordance with the Design Standards. The edges of the existing concrete pavement adjacent to trenches where damaged subsequent to saw cutting of pavement shall again be saw cut in a neat straight line to remove the damaged pavement areas. Such saw cuts shall be parallel to the original saw cuts and perpendicular to the pavement surface.

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 to the limits shown on the Plans.

3.05 REPLACEMENT OF PAVEMENT

A. Asphalt or Surface Treated Pavements: Replacement of asphalt or surface treated pavement and base shall consist of 8 inches of Class A concrete base and 1 inch of asphaltic concrete surface course Mix No. 1 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 8 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

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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 Owner, 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.

3. Curing and cold weather protection shall be performed as provided for under Specification Section 02750 Paragraph 3.11. No vehicles or loads shall be permitted on any concrete until the Owner has determined that the concrete has obtained sufficient strength for such loads. The contractor shall construct and place such barricades and protection devices as are necessary to protect the concrete.

D. Placing Asphaltic Concrete Wearing Surface: After the concrete base has been placed and adequately cured, an asphaltic concrete wearing surface of the minimum specified thickness shall be placed and compacted as specified in Specification Section 02710.4 Paragraphs 3.01 – 3.11, Asphaltic Concrete, Construction Requirements.

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 requirements of Specification Section 02775 Paragraphs 3.01 – 3.08, "Portland Cement Concrete Sidewalks and Driveways, Construction Requirements". 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 concrete elevation, texture, and color shall conform to the adjacent concrete surfaces.

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. New concrete curb and gutter construction shall conform to the requirements of Specification Section 02770 Paragraphs 3.01 – 3.10, "Curb, Curb and Gutter, and Water Table, Construction Requirements". 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 Owner.

3.07 DAMAGE DUE TO SETTLEMENT

A. The Contractor 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,

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and during a period of one year from and after the date of Final Acceptance of the Work covered by the Contract.

B. During such period, the Contractor 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 City. Should the Contractor fail to repair settlement damage which may occur as described above within 30 days after being given notice thereof, the City shall have the right to repair such settlement and charge the cost of such repairs to the Contractor.

3.08 DAMAGE OUTSIDE CONSTRUCTION EASEMENT LIMITS

A. The Contractor 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 Subcontractors in hauling or otherwise transporting materials to and from the several sites of Work, regardless of the location of such damage. The Contractor 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 owner or owners of such damaged surfaces or structures, or to their legally responsible officers, agents, or other representatives, at the Contractor's cost and expense.

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 DRIVEWAY APRON REMOVAL AND REPLACEMENT

Driveway apron removal and replacement shall be measured for payment by the square foot, complete in place.

4.04 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.

4.05 ASPHALT OR CONCRETE DRIVEWAY AND PAVED AREA REMOVAL AND REPLACEMENT

Asphalt or concrete driveway and paved area removal and replacement shall be measured for payment by the square foot, complete in place.

4.06 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 Camden gravel or crushed limestone, complete in place.

4.07 ASPHALT AND CONCRETE CURB REMOVAL AND REPLACEMENT

Asphalt and concrete curb removal and replacement shall be measured for payment by the linear foot along the face of curb, 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 contract 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,

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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 DRIVEWAY APRON REMOVAL AND REPLACEMENT

The accepted quantities of driveway apron removal and replacement shall be paid for at the contract unit price per square foot for the type specified, which price will be full compensation for removal and disposal of driveway apron; preparing the subgrade; and placing, finishing, curing, and protection of concrete, complete in place.

5.04 CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT.

The accepted quantities of curb and gutter removal and replacement shall be paid for at the contract 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.

5.05 ASPHALT OR CONCRETE DRIVEWAY AND PAVED AREA REMOVAL AND REPLACEMENT

The accepted quantities of asphalt or concrete driveway and paved area removal and replacement shall be paid for at the contract unit price per square foot 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 asphalt, complete in place.

5.06 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 contract unit price per ton of Camden gravel or crushed limestone, which price will be full compensation for preparing the subgrade and replacing the gravel, complete in place.

5.07 ASPHALT AND CONCRETE CURB REMOVAL AND REPLACEMENT

The accepted quantities of asphalt and concrete curb removal and replacement shall be paid for at the contract unit price per linear foot, which price will be full compensation for removal and disposal of curb and placing new curb, complete in place.

5.08 PAYMENT WILL BE MADE UNDER:

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
02950-01	PAVEMENT REMOVAL AND REPLACEMENT	Square Yard
02950-01.01	Asphaltic Concrete Pavement	Square Yard
02950-01-02	Concrete Pavement	Square Yard
02950-02	CONCRETE SIDEWALK REMOVAL AND REPLACEMENT	Square Foot
02950-03	CONCRETE DRIVEWAY APRON REMOVAL AND REPLACEMENT	Square Foot
02950-03.____	(Description)	Square Foot
02950-04	CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	Linear Foot
02950-04.____	(Description)	Linear Foot

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02950-05	ASPHALT OR CONCRETE DRIVEWAY AND PAVED AREA REMOVAL AND REPLACEMENT	Square Foot
02950-05.01	Asphalt Driveway and Paved Area	Square Foot
02950-05.02	Concrete Driveway and Paved Area	Square Foot
02950-06	GRAVEL DRIVEWAY AND GRAVEL AREA REMOVAL AND REPLACEMENT	Ton
02950-06.01	Replacement with Camden Gravel	Ton
02950-06.02	Replacement with Crushed Stone	Ton
02950-07	ASPHALT AND CONCRETE CURB REMOVAL AND REPLACEMENT	Linear Foot
02950-07.01	Concrete Curb	Linear Foot
02950-07.02	Asphalt Curb	Linear Foot

END OF SECTION 02950