

PWC

Fayetteville's

HOME TOWN UTILITY

CONTRACT DOCUMENTS FOR

MANHOLE REHABILITATION – FIBERGLASS REINFORCED EPOXY

July 2017

Fayetteville Public Works Commission
Operations Center
955 Old Wilmington Road
Fayetteville, NC 28301



TABLE OF CONTENTS

BIDDING AND CONTRACTING REQUIREMENTS5

00100 – NOTICE TO BIDDERS7

00200 – INSTRUCTIONS TO BIDDERS9

00240 – BID SCHEDULE.....13

00300 – BID PROPOSAL FORM.....15

00320 – BIDDER QUALIFICATIONS19

00511 – PERFORMANCE BOND FORM21

00512 – PAYMENT BOND FORM23

00550 – NOTICE TO PROCEED FORM25

GENERAL REQUIREMENTS.....27

00600 – DEFINITIONS AND TERMS.....29

00700 – GENERAL CONDITIONS33

01000 – SPECIAL CONDITIONS45

01025 – MEASUREMENT AND PAYMENT57

APPENDICES.....61

APPENDIX A – TECHNICAL SPECIFICATIONS

02272 – EROSION CONTROL

02730 – SANITARY SEWER SYSTEMS

02750 – WASTEWATER FLOW CONTROL

02763 – MANHOLE LINING – CURED IN PLACE / FIBERGLASS REINFORCED EPOXY

02765 – CHIMNEY SEALS

APPENDIX B – STANDARD DETAILS

S.2 – STANDARD MANHOLE

S.5 – DROP MANHOLE

S.4 – PIPE SLIDE

S.6 – LOCKING RING & COVER

S.7 – STANDARD RING & COVER

N.1 – GENERAL NOTES

N.3 – GENERAL NOTES - RESIDENT RELATIONS

APPENDIX C – SMALL DISADVANTAGED BUSINESS ENTERPRISE PROGRAM

SDBE CONTRACT PROVISIONS COMPLIANCE FORM

SDBE IDENTIFICATION OF SDBE PARTICIPATION

SDBE AFFIDAVIT A

SDBE AFFIDAVIT B

SDBE AFFIDAVIT C

SDBE AFFIDAVIT D

SDBE AFFIDAVIT E

APPENDIX D – MAPS

BIDDING AND CONTRACTING REQUIREMENTS

00100 – NOTICE TO BIDDERS

NOTICE Pursuant to N.C.G.S. 143-131, the Fayetteville Public Works Commission (PWC) will received sealed proposals for: **MANHOLE REHABILITATION – FIBERGLASS REINFORCED EPOXY**.

Proposals will be received in the Procurement Department, 1st floor, PWC Administration Building, 955 Old Wilmington Road, Fayetteville, North Carolina until **5:00 PM, Friday, August 25, 2017**.

This project consists of rehabilitating existing concrete, brick, and block manholes. Work shall include removal and replacement of rings and covers, installation of chimney seals, installation of water-tight rings and covers, cleaning and preparation of the manhole, installation of the fiberglass reinforced manhole lining system, testing of the new lining system, and all other items necessary to provide a complete project. All work shall be done in accordance with PWC standards and these Contract Documents.

A **mandatory** pre-bid conference will be held at **11:00 AM, Tuesday, August 8, 2017** in the Skills Lab, PWC Administration Building, 955 Old Wilmington Road, Fayetteville, North Carolina.

Plans, specifications, and contract documents, may be obtained in the Procurement Office of the Public Works Commission, 1st floor, PWC Administration Building, 955 Old Wilmington Road, Fayetteville, North Carolina, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday.

The Fayetteville Public Works Commission reserves the right to reject any or all bids, waive all informalities concerning bid, or award bid to the lowest responsible bidder or bidders, taking into consideration quality, performance, and the time specified in the proposals for the performance of the contract.

PUBLIC WORKS COMMISSION

Gloria B. Wrench

Procurement Manager

00200 – INSTRUCTIONS TO BIDDERS

1. General

The submission of a Bid constitutes an incontrovertible representation by the Bidder that he has complied with every requirement of this Section and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

In the solicitation or awarding of contracts, the Fayetteville Public Works Commission (PWC) shall not discriminate because of the race, religion, color, sex, age, disability or national origin of the Bidder. PWC reserves the right to reject any and all Bids, to waive any and all informalities, and to disregard all nonconforming, nonresponsive or conditional Bids. In case of a tie Bid, the tie shall be decided by lot.

2. Statutory Requirements For Contracting with PWC

By submitting a bid for this project, the Bidder certifies that he meets the statutes and regulations listed below.

- a) LICENSING: No person or entity shall contract for or bid upon the construction, removal, repair, or improvements to or upon real property owned controlled or leased by the City of Fayetteville unless that person or entity holds a valid General Contractor license issued by the North Carolina Licensing Board for General Contractors in accordance with NCGS Chapter 87-Articles 1 and 1A, and NCAC Title 21 - Chapter 12. The Contractor's license shall include the classification of Public Works, and the license shall be Unlimited.
- b) VERIFICATION OF WORK AUTHORIZATION: The Contractor shall verify the work authorization of his employees using the Federal E-Verify program. The Contractor shall comply with all requirements of the E-Verify program in accordance with Federal law and in accordance with NCGS Chapter 64 - Article 2. The Contractor shall ensure that all subcontractors, whether currently employed or subsequently hired, comply with all E-Verify requirements. Failure to comply with these requirements shall be considered a breach of Contract.
- c) IRAN DIVESTMENT ACT: As mandated by NCGS. 147-86.59(a), the Contractor hereby certifies that he is not listed on the Final Divestment List created by the North Carolina State Treasurer pursuant to NCGS 147-86.58. The Contractor/Vendor further certifies that in accordance with NCGS 146-86.58(b) that it shall not utilize any subcontractor found on the State Treasurer's Final Divestment List. The Contractor/Vendor certifies that the signatory to this Contract is authorized by the Contractor/Vendor to make the foregoing statement.
- d) UTILIZATION OF SMALL BUSINESS CONCERNS: Pursuant to 48 CFR 52.219-8, small business concerns shall have the maximum practicable opportunity to participate in performing contracts let by PWC. To this extent, the Contractor shall make every effort to award subcontracts to small business concerns consistent with efficient contract performance.

3. Small Disadvantaged Business Enterprise Program

Fayetteville PWC adheres to the Small Disadvantaged Business Enterprise Program (SBDE) administered by the City of Fayetteville. The SDBE forms are included in the Appendix. All requirements imposed upon Bidders shall be made a part of these Contract Documents. Contractors shall comply with all requirements set forth in the SDBE specifications.

The SDBE seeks to involve small, minority owned, and women owned business in construction projects. The SDBE goal is for 10% of the awarded contract amount to be subcontracted to SDBE qualifying businesses.

The Bidder shall submit the required SDBE forms with his Bid in accordance with the following:

- a. If any portion of the Work on this project will be subcontracted, the Bidder shall submit:
 - (1) *SDBE Contract Provisions Form*; AND

- (2) *Affidavit A – Listing Of Good Faith Efforts*; AND
 - (3) *Identification Of SDBE Participation*, which shall certify the subcontractors that will be utilized on this project
- b. If no portion of the Work will be subcontracted, and all elements of the Work on this project will be performed by the Bidder's own employed forces, the Bidder shall submit:
- (1) *SDBE Contract Provisions Form*; AND
 - (2) *Affidavit B – Intent To Perform Contract With Own Workforce*; AND
 - (3) *Identification Of SDBE Participation*, which shall indicate \$0.00 for the value of SDBE participation

Upon being named apparent low Bidder, The Bidder shall submit the required SDBE forms:

- a. If the portion of the Work that will be completed by SDBE subcontractors is **equal to or greater** than 10% of the Bidder's total contract price, the Bidder shall submit:
 - (1) *Affidavit C – Portion Of Work To Be Performed By Small Disadvantaged Firms*
- b. If the portion of the Work that will be completed by SDBE subcontractors is **less than** 10% of the Bidder's total contract price, the Bidder shall submit:
 - (1) *Affidavit D - Good Faith Efforts*

The approved SDBE participation submitted by the Contractor shall be the Contract requirement.

4. Copies Of Contract Documents

Complete sets of Contract Documents shall be used in preparing bids. PWC does not assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Contract Documents. Complete sets of Contract Documents may be obtained from the PWC Procurement Department.

5. Examination of Site and Documents

Before submission of a bid, prospective bidders shall

- a) Examine the Contract Documents thoroughly,
- b) Visit the site to observe conditions that may in any manner affect cost, progress, or performance of the Work,
- c) Be familiar with federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress, or performance of the Work,
- d) Study and carefully correlate site conditions with the Contract Documents, and
- e) Give the PWC Procurement Manager written notice of all conflicts, errors, or discrepancies in the Contract Documents.

6. Interpretations and Addenda

All questions about the meaning or intent of the bid or Contract Documents shall be submitted in writing to Gloria Wrench, Procurement Manager, by fax (910-483-1429) or via e-mail gloria.wrench@faypwc.com. In order to receive consideration, questions must be received by PWC no later than the date indicated in Section 00240 – *Bid Schedule*.

Any interpretations of questions so raised, which in the opinion of Project Engineer require interpretations, will be issued by Addenda mailed or delivered to all parties recorded by PWC as having received the Contract Documents, not later than the date indicated in *Section 00240 – Bid Schedule*. An Addendum extending the date for the receipt of Bids or an Addendum withdrawing the Invitation to Bid may be issued any time prior to the date set for the receipt of Bids.

PWC will not be responsible for oral interpretations or clarifications, which anyone presumes to make on their behalf. **Bidders are expressly prohibited from contacting any PWC official or employee associated with this project, except as noted above. Violation of this prohibition is grounds for the immediate disqualification of the bidder.**

Each Bidder shall be responsible for determining that all Addenda issued by PWC have been received before submitting a Bid for the Work. Each Bidder shall acknowledge the receipt of each Addendum on the Bid Form.

7. Submission of Bids

Prospective bidders shall complete *Section 00300 – Bid Proposal Form* and shall submit all documentation required in *Section 00320 – Bidder Qualifications*. The forms shall be properly signed and dated where indicated. All bid packages shall be sealed in an envelope and addressed to:

Fayetteville Public Works Commission
Attention: Gloria Wrench, Procurement Manager
955 Old Wilmington Road
Fayetteville, NC 28301

8. Bid Evaluation

PWC will review all of the bids and qualification data to determine the lowest responsive, responsible Bidder. PWC reserves the right to not award the Contract to the lowest bidder if all Bid submittal information is not complete, does not meet the satisfaction of the PWC, or has been falsified.

Prior to award of the Contract, PWC may request Bidders to furnish the additional information listed below for use in determining the lowest responsive, responsible bidder:

- a) A current financial statement or other documentation showing assets and liabilities of the Company.
- b) Permanent name and address of place of business.
- c) The number of employees of the organization and length of time the organization has been in business under the present name.
- d) The name and address of the surety proposed and the name and address of the responsible local adjuster for insurance claims.
- e) A written statement from the bonding company listing total and available bonding capacity.
- f) The names of members of the firm who hold appropriate trade licenses, together with license numbers.
- g) Documentation that the company is a licensed utility contractor in the state of North Carolina.
- h) An affidavit stating whether or not any OSHA violations have occurred within the past three (3) years.
- i) Copy of current Certificate of Insurance.

Failure or refusal to furnish any items requested by PWC shall constitute a basis for disqualification of any Bidder. Should PWC adjudge that the apparent low bidder is not the lowest, responsive, responsible bidder by virtue of the information requested, said apparent low bidder will be so notified.

9. Award of Contract

After all bid packages have been reviewed, PWC will select the lowest, responsive, responsible bidder as successful bidder and will issue a Notice of Award letter and a Purchase Order.

Upon receipt of the Notice of Award and Purchase Order, the successful bidder shall furnish the appropriate bonds and insurance certificates to PWC's Purchasing Department within ten (10) business days unless otherwise stated in the Notice of Award letter. If the successful bidder fails to provide such requested information within this time, the Public Works Commission reserves the right to cancel the Purchase Order and proceed with awarding the contract to the next lowest, responsive, responsible bidder. This time may be extended at the sole discretion of PWC.

10. Performance and Payment Bonds

The Contractor shall provide performance and payment bonds meeting the requirements set forth in section *00700 – General Conditions* under the General Performance and Payment Bonds sub-section. The Contractor shall utilize the forms in section *00511 – Performance Bond Form* and section *00512 – Payment Bond Form*.

11. General Insurance

The Contractor shall provide insurance for this Project as set forth in section 00700 – *General Conditions* under the General Insurance Requirements sub-section.

12. Contract Period

This Contract will be effective for a period of one-year from the date of award, or at the end of the fiscal year in which this Contract was awarded, whichever comes first. PWC's fiscal year runs from July 1 to June 30.

The quantities listed herein are intended to represent PWC's best estimate of the work to be performed during a one-year period, in various locations as directed by PWC. As the quantities listed are estimates only, PWC does not guarantee that the selected Contractor will complete all of the work indicated in the estimated quantities.

At PWC's option, this Contract may be renewed for each of the succeeding fiscal years. The Contract may be renewed for a maximum of four (4) contract periods. Near the end of each contract period, PWC maintains the option to renew the Contract for an additional contract period if:

- a) The Contractor's workmanship, performance and production rate are satisfactory,
- b) Funding is available,
- c) Both parties agree to the renewal, and
- d) There is a need for the work.

The decision to renew or not to renew the contract lies solely with PWC. The decision will be issued to the Contractor in writing, no later than 60 calendar days prior to expiration of the contract period.

The increased cost of insurance and bond fees for the new contract period will be paid at the actual cost (invoice submitted), up to but not to exceed the lump sum for Initial Mobilization.

13. Increase of Unit Prices

All unit prices submitted herein shall be held firm against any increase for the initial one-year contract period.

If the Contract is renewed for an additional contract period, the Contractor may submit a request that each unit price be adjusted to account for annual inflation of labor, materials, and equipment. The adjustment of unit prices shall be based on the most recently published *Engineering News Record Construction Cost Index* for the annual change, not to exceed 3.0%. The Contractor shall submit a request for a unit price adjustment no later than June 15th, or the next business day, should the 15th fall on a weekend. PWC shall reject any requests for adjustment received after this date.

PWC reserves the right to accept or reject individual line item adjustments or cancel the Contract entirely. PWC shall notify the Contractor of its decision not later than 15 business days after receipt of a properly documented request for price adjustment. Any adjustments accepted by PWC shall become effective the month following approval and shall be valid for the duration of the Contract Period.

The Contractor may request an adjustment for unit prices at each renewal of the Contract.

00240 – BID SCHEDULE

The following table summarizes the dates and times regarding bids for this project.

Pre-Bid Conference (MANADATORY)	11:00 AM, Tuesday, August 8, 2017 Skills Lab PWC Administration Building 955 Old Wilmington Road Fayetteville, NC 28301
Deadline for Questions from Bidders	5:00 PM, Tuesday, August 15, 2017 All Questions must be submitted in writing.
Deadline for Addenda issued by Engineer	5:00 PM, Friday, August 18, 2017
Deadline for Bids	5:00 PM, Friday, August 25, 2017
Date of Availability	Date when the contract is executed by both the successful bidder and PWC

All proposals must be received no later than **5:00 PM, Friday, August 25, 2017**. Late bids will not be considered and will be returned to the Bidder unopened. Bids will be opened the next business day. This is an informal bid; therefore there will be no formal bid opening. Bids will be examined promptly after opening and an award will be made at the earliest possible date. Bids must be held firm for acceptance by the Public Works Commission for a period of sixty (60) calendar days after the bid opening date.

Questions regarding this bid shall be submitted in writing to the attention of Gloria Wrench, Procurement Manager, by fax (910-483-1429) or via e-mail (gloria.wrench@faypwc.com) no later than the date and time stated above. Oral explanations and interpretations made prior to bid opening shall not be binding. **Bidders are expressly prohibited from contacting any PWC official or employee associated with this Request for Proposals, except as noted above. Violation of this prohibition is grounds for the immediate disqualification of the bidder.**

The Public Works Commission will provide all bidders with responses to any questions. If the questions result in revisions to the plans and/or this Request for Proposal, an addendum will be issued by the PWC Project Engineer no later than the date and time stated above.

00300 – BID PROPOSAL FORM

PROJECT: **MANHOLE REHABILITATION – FIBERGLASS REINFORCED EPOXY**

THIS BID IS SUBMITTED TO: Fayetteville Public Works Commission, hereinafter called PWC

BY: _____ Hereinafter called BIDDER,

In submitting this Bid, BIDDER acknowledges that:

- a) BIDDER accepts all of the terms and conditions of the Instructions to Bidders, including, without limitation, those dealing with the disposition of payment and performance bonds, and insurance certificates;
- b) If this Bid is accepted, BIDDER will enter into a Contract with PWC to perform the Work in accordance with the Contract Documents; Payment for the Work will be based on the quantities of work actually performed and will be paid at the line item prices indicated in this Bid;
- c) The Award of Contract will be made on the basis of the total Bid amount, not individual line item prices; the total Bid amount will be determined as the sum of the line item prices;
- d) BIDDER has examined copies of all the Bidding Documents and Contract Documents (including all Addenda), and acknowledges that the Bidding Documents and Contract Documents are sufficient to convey understanding of all conditions and terms for performing and furnishing the Work for which this Bid is submitted;
- e) BIDDER has examined and is in compliance with all legal requirements (including any and all legal requirements not mentioned the Bidding Documents or Contract Documents) required to submit the Bid and to perform the Work
- f) BIDDER has examined the site and locality where the Work is to be performed; the conditions affecting cost, progress, and performance of the work; and has made such independent investigations as he deems necessary;
- g) PWC does not assume responsibility for the accuracy of dimensions or completeness of information in the Bidding Documents with respect to existing features and existing conditions at or contiguous to the site of the Work;
- h) No additional examinations, investigations, explorations, tests, studies, or data are necessary for the proper submission of the Bid.
- i) BIDDER has given PWC written notice of all conflicts, errors, ambiguities, or discrepancies that he has discovered in the Bidding Documents and/or Contract Documents and he has accepted the written resolution thereof by PWC,
- j) Discrepancies in the multiplication of units of work and unit prices will be resolved in favor of the correct multiplication of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.
- k) Quantities shown on the Bid Form are estimated and are not guaranteed; they are solely for comparing Bids and establishing the total Bid amount.

Item Num.		Estimated Quantity	Unit	Unit Price	Total
1.	Mobilization	1	L.S.		
2.	Bench and Invert Replacement		Each		
3.	Cover and Frame Resetting		Each		
4.	Install Locking Ring & Cover		Each		
5.	Chimney Seals		Each		
6.	Fiberglass Reinforced Epoxy Lining System Measured by Vertical Feet (4' Diameter Manhole)		V.F.		
7.	Fiberglass Reinforced Epoxy Lining System Measured by Square Feet (Greater than 4' Dia. Manhole)		S.F.		
8.	Abrasive Blast Cleaning		Each		
9.	Remove and Replace Inside Drop Structure		Each		

Total Bid Amount: \$ _____

The BIDDER has received, acknowledged, and used the following addenda in completing the Bid.
(Initial and Date as appropriate).

Addendum No. 1 _____ Dated: _____
Addendum No. 2 _____ Dated: _____
Addendum No. 3 _____ Dated: _____
Addendum No. 4 _____ Dated: _____

Name of CONTRACTOR: _____

Federal Employer Identification Number: _____

NC Contractor License Number: _____

Business Address: _____

Phone Number: _____

Name and Title of Authorized Signatory: _____

(Authorized Signatory)

(Date)

(Witness)

(Date)

00320 – BIDDER QUALIFICATIONS

In an effort to ensure that the completed work is of good quality and workmanship, only proven products with substantial successful long-term track records will be approved. **The Bidder is required to submit the documentary data listed below as part of his bid submission package.** This will allow PWC to verify that the Bidder is qualified to perform the work described in these Contract Documents. The following criteria are intended to indicate the minimum requirements for work on PWC projects. Contractors and prospective bidders shall meet all of the criteria listed in order to be considered for award of this bid.

- a) The Contractor shall have a minimum of six (6) years active experience in commercial installation of the product.
- b) The Contractor shall have successfully installed the proposed lining system in a minimum of 800 manholes and shall have a minimum of four (4) years of service in the ground as documented by verifiable references.
- c) The Contractor shall have completed a minimum of five (5) separate lining projects within the previous five (5) years. These projects shall be of similar scope and nature to the Work described in these Contract Documents. A minimum of one (1) project shall be an annual contract, similar in scope and nature to the Work described in these Contract Documents.
- d) The Contractor shall have completed a minimum of three (3) years of continuous experience on similar trowel type underlayment projects.
- e) The Contractor shall provide a list of projects and shall include the following for each project:
 - (i) Client, Project Name, and Location
 - (ii) Date and duration of project
 - (iii) Scope of project (number and nature of structures rehabilitated)
 - (iv) Client References (names and contact information) to verify project information. Preferably, each project should have a separate reference.
- f)
- g) The Contractor shall be full qualified, experienced and equipped to complete the work within the time specified and in a satisfactory manner. The Contractor shall be capable of providing crews as needed to complete the work without undue delay. The Contractor shall provide a list of resources (i.e., crews, equipment, etc.) that indicates their ability to complete the work.
- h) The Contractor shall be certified and/or licensed as an installer by the lining system manufacturer. The Contractor shall submit a certified statement from the manufacturer that he is a certified and/or licensed installer of the proposed lining system.
- i) The Contractor's superintendent shall have been responsible for or managed projects similar in size to this proposed project, in the past four (4) years in the United States. Contractor shall provide a minimum of five (5) references, to document the proposed superintendent's ability and qualifications to meet this requirement. Each reference should be from separate projects.
- j) The Contractor shall provide documentation indicating how he plans to access those manholes that are located in easement areas. The documentation should include equipment access requirements and equipment needed to install the proposed lining system.

PWC may conduct such investigations/verifications as deemed necessary to establish the responsibility, qualification and financial ability of the Bidder. Should PWC adjudge that the apparent low bidder is not the lowest responsive, responsible bidder by virtue of the above information furnished, said apparent low bidder will be so notified and his bid security shall be returned to him without prejudice. Failure or refusal to furnish any items of information requested by PWC shall be considered as non-responsive and therefore basis for rejection of the bid.

00511 – PERFORMANCE BOND FORM

Date of Execution: _____
Name of Principal: _____
Name of Surety: _____
Name of Contracting Body: Fayetteville Public Works Commission
Amount of Bond: _____

PROJECT: MANHOLE REHABILITATION – FIBERGLASS REINFORCED EPOXY

KNOW ALL MEN BY THESE PRESENTS, that We, the PRINCIPAL and Surety above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these present.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal entered into a certain Contract with the Contracting Body, identified as shown above and hereto attached.

NOW, THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term of said Contract and any extensions there of that may be granted by the Contracting Body, with or without notice to the Surety, and during the life of any Guaranty required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under the several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Executed in _____ counterparts.

CONTRACTOR:

(Trade Name or Corporate Name)

By: _____

Title: _____
(Owner, Partner, Corporate President or Vice-President,
Only)

Attest or
Witness: _____

Title: _____
(Must be Corporate Secretary or Assistant
Secretary if Corporation)

(Affix Corporate Seal)

SURETY COMPANY:

By: _____

Title: _____
(Attorney in Fact)

Witness: _____
(N.C. Licensed Resident Agent)

Address of Resident Agent:

(Affix Corporate Seal)

Address of Regional or Branch Office:

00512 – PAYMENT BOND FORM

Date of Execution: _____
Name of Principal: _____
Name of Surety: _____
Name of Contracting Body: Fayetteville Public Works Commission
Amount of Bond: _____

PROJECT: MANHOLE REHABILITATION – FIBERGLASS REINFORCED EPOXY

KNOW ALL MEN BY THESE PRESENTS, that We, the PRINCIPAL and Surety above named, are held and firmly bound unto the above named Contracting Body, hereinafter called the Contracting Body, in the penal sum of the amount stated above the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal entered into a certain Contract with the Contracting Body, identified as shown above and hereto attached.

NOW, THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term of said Contract and any extensions there of that may be granted by the Contracting Body, with or without notice to the Surety, and during the life of any guaranty required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under the several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Executed in _____ counterparts.

CONTRACTOR:

(Trade Name or Corporate Name)

By: _____

Title: _____
(Owner, Partner, Corporate President or Vice-President,
Only)

Attest or
Witness: _____

Title: _____
(Must be Corporate Secretary or Assistant
Secretary if Corporation)

(Affix Corporate Seal)

SURETY COMPANY:

By: _____

Title: _____
(Attorney in Fact)

Witness: _____
(N.C. Licensed Resident Agent)

Address of Resident Agent:

(Affix Corporate Seal)

Address of Regional or Branch Office:

00550 – NOTICE TO PROCEED FORM

TO: _____ DATE: _____

PROJECT: MANHOLE REHABILITATION – FIBERGLASS REINFORCED EPOXY

You are hereby notified that Work under this Project shall commence on

the _____ day of _____, 20____; and the date of final completion shall be no later than
the 30th day of June, 2018.

FAYETTEVILLE PUBLIC WORKS COMMISSION

BY: _____

Gloria B. Wrench

Procurement Manager

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED

is hereby acknowledged this the _____ day of _____, 20____.

CONTRACTOR

BY: _____

TITLE: _____

GENERAL REQUIREMENTS

00600 – DEFINITIONS AND TERMS

1. Definitions

- a. **ADDENDA:** Written or graphic instruments issued prior to the opening of Bids, which clarify, correct, or change the Bidding Requirements or the Contract Documents.
- b. **APPLICATION FOR PAYMENT:** The form acceptable to PWC which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
- c. **BID:** The offer or proposal of a bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
- d. **BIDDER:** The person, firm, or corporation who submits a Bid for Work directly to PWC.
- e. **BIDDING DOCUMENTS:** The Bidding Requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).
- f. **BIDDING REQUIREMENTS:** The Advertisement or Invitation to Bid, Instructions to Bidders, Bid security form, if any, and the Bid form with any supplements.
- g. **BONDS:** Bid, Performance, and Payment bonds and other instruments of security.
- h. **BUSINESS DAY:** A "business day" shall constitute the period of time from 8:00 a.m. to 5:00 p.m. within single calendar day, excluding Saturdays, Sundays, and all holidays observed by PWC.
- i. **CALENDAR DAY:** A "calendar day" shall constitute a period of 24 consecutive hours measured from midnight to the next midnight
- j. **CLAIM:** A demand or assertion by PWC or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
- k. **CLAIM (PROPERTY DAMAGE):** Any form of injury or damage caused to the property, either personal or real due to the negligence of the Contractor as detailed by claimant.
- l. **CONTRACT DOCUMENTS:** The combined bidding documents (Instructions to Bidders, Special Provisions, etc.), technical specifications, contract drawings, and all addenda. Shop drawing submittals are not considered Contract Documents.
- m. **CONTRACTOR:** The individual or entity with whom PWC has entered into the Contract.
- n. **CRITICAL PATH:** The sequence of activities in the schedule for which an adjustment in the duration of any activity results in a corresponding adjustment in the overall schedule duration.
- o. **DRAWINGS:** The drawings which show the scope, extent and character of the Work to be furnished and performed by Contractor and which have been prepared or approved by Project Engineer and are referred to in the Contract Documents. Shop drawings are not considered Drawings as so defined.
- p. **DEFECTIVE:** The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to Project Engineer recommendation of final payment.
- q. **FREE HAUL LIMIT:** Area within 2 miles of the project limits, one way.

- r. **HAZARDOUS ENVIRONMENTAL CONDITION:** The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.
- s. **HAZARDOUS WASTE:** The term Hazardous Waste shall have the meaning provided in the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
- t. **LAWS AND/OR REGULATIONS:** Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
- u. **LIENS:** Charges, security interests, or encumbrances upon Project funds.
- v. **NOTICE TO PROCEED:** A written notice given by PWC to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
- w. **NON COMPLIANCE NOTICE (NCN):** A written notice given by the PWC to Contractor indicting a violation in Contract Terms.
- x. **PROJECT:** The Work to be performed under the Contract Documents.
- y. **PWC:** The Fayetteville Public Works Commission acting through its authorized representatives, primarily the Water Resources Engineering Department located at 955 Old Wilmington Road, Fayetteville, NC. PWC is entity with whom Contractor has entered into the Contract and for whom the Work is to be provided.
- z. **PWC PROJECT COORDINATOR:** The authorized representative of Project Engineer who may be assigned to the Site or any part thereof.
- aa. **PWC PROJECT ENGINEER:** Person designated by PWC, to coordinate, manage, monitor, and shall administer the construction program. The PWC Project Engineer has the authority to approve any changes in scope of Work.
- bb. **SAMPLES:** Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
- cc. **SHOP DRAWINGS/SUBMITTALS:** All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
- dd. **SITE:** Lands or areas indicated in the Contract Documents as being furnished by PWC upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by PWC which are designated for the use of Contractor.
- ee. **SPECIFICATIONS:** That part of the Contract Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.
- ff. **SUBCONTRACTOR:** An individual or entity having a direct Contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
- gg. **SPECIAL CONDITIONS:** That part of the Contract Documents which amends or supplements the Contract Documents.
- hh. **SUPPLIER:** A manufacturer, fabricator, supplier, distributor, material man, or vendor having a direct Contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

- ii. **UNDERGROUND FACILITIES:** All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
- jj. **WORK:** The entire completed construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

2. Terminology

- a) Intent of Certain Terms or Adjectives: Whenever in the Contract Documents the terms “as allowed,” “as approved,” or terms of like effect or import are used, or the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination by the PWC Project Engineer as to the Work, it is intended that such action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to the PWC Project Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.
- b) The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
- c) The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
- d) The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
- e) When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.
- f) Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.
- g) The use of the singular masculine pronoun shall not exclude the feminine or neuter, neither shall it exclude the plural.

00700 – GENERAL CONDITIONS

1. Resolving Discrepancies in These Documents

Except as may be otherwise specifically stated in the Contract Documents, the following order of precedence shall be adhered to for resolving any conflict, error, ambiguity, or discrepancy between the provisions of these Contract Documents:

- a) Any addendum issued prior to the opening of Bids
- b) Special Conditions
- c) Measurement and Payment
- d) Approved Contract Drawings
- e) PWC Standard Details
- f) PWC Technical Specifications
- g) General Conditions of the Contract Documents

2. General Bid Information

The Fayetteville Public Works Commission (PWC) reserves the right to reject any and all bids, to waive any and all informalities, and to disregard all non-conforming, non-responsive, or conditional bids.

The PWC reserves the right to request client references from any and all bidders, in order to verify that the bidder is qualified to perform the work. The bidder shall promptly provide such references upon request from the PWC. Failure to do so may result in the bidder being disqualified.

Estimated quantities are given in the proposal for the purpose of comparing unit price bids, and while the quantities are believed to be a close approximation, payment will be calculated on the basis of the actual work executed at the unit prices in this Proposal. The PWC reserves the right to increase and/or decrease any or all of the quantities as listed in this Proposal at the same unit price or prices as listed in this Proposal.

All unit prices submitted herein shall be firm against any increase for the contract period.

The PWC further reserves the right to delete any single item or combination of items from the successful bidder's proposal.

The Contractor is responsible for inspecting and examining the site prior to submitting the bid. No additional allowances will be made because the Contractor failed to properly consider the nature of the work.

3. General Performance and Payment Bonds

The Contractor, at the time of the execution of the Contract shall be required to furnish a Performance Bond and Payment Bond in an amount equal to at least one-hundred percent (100%) of the Contract price as security for the faithful performance of this Contract and as security for the payment of all persons performing labor and furnishing materials and equipment in connection with this Contract in accordance with N.C.G.S. Chapter 44A, Article 3.

The corporate surety furnishing the bonds shall be authorized to do business in the state of North Carolina, and shall be acceptable to the PWC. All contract payment bonds and contract performance bonds shall be executed on "Performance Bond" and "Payment Bond" forms provided in this Proposal and be countersigned by a regularly authorized agent of the corporate surety who is resident in North Carolina and who is licensed by the North Carolina Department of Insurance.

In all Performance and Payment Bonds, the provision that no suit, action, or proceeding by reason of any default whatsoever shall be brought on this Bond after a specified number of months shall be fixed at twelve (12) months. The face value of the Bond shall be one-hundred percent (100%) of the Contract price for a period of twelve (12)

months following the day when the last of the labor was performed, or equipment was furnished, or final settlement was made with the Contractor, whichever occurs last.

Whenever the Surety or Sureties on the bond so furnished shall be deemed by the PWC to be insufficient or unsatisfactory, the Contractor, within ten (10) calendar days after notice to that effect shall furnish and deliver a new bond to the PWC in the same penalty and on the same conditions with Surety satisfactory to the PWC and this duty shall continue on the part of the Contractor, whenever and so often as the PWC shall require a new bond with a satisfactory Surety or Sureties. If the Contractor shall fail to furnish such bond, within ten (10) calendar days after said notice is mailed to his address, the PWC through its proper agent or agents, may stop all further work under said Contract and complete the unfinished work at the expense of the Contractor.

4. General Insurance Requirements

- 1) The insurance required for this contract is as follows:
 - a) Commercial General Liability ISO #CG 00 01 10 93: The Contractor shall take out and maintain during the life of this contract commercial general liability insurance with limits of \$1,000,000 per occurrence; \$2,000,000 aggregate other than products/completed operations; \$2,000,000 aggregate for products/completed.
 - b) Automobile Liability ISO #CA 00 01 12 93: The Contractor shall take out and maintain during the life of this contract automobile liability insurance in an amount not less than \$1,000,000 combined single limit per accident for bodily injury and property damage from owned, non owned, and hired automobiles.
 - c) Workers' Compensation and Employers' Liability Insurance: The Contractor shall take out and maintain during the life of this contract workers' compensation insurance as required by the laws of the State of North Carolina and Employers' Liability with limits of \$100,000 each accident, \$500,000 policy limit and \$100,000 each employee for all employees employed on the project. In case any employee(s) engaged in work under this contract is or are not protected under the Workers' Compensation Statute, the Contractor shall provide adequate coverage for the protection of employees not otherwise protected.
 - d) Property Insurance: If contracted to construct a building, the Contractor shall purchase and maintain "Builder's Risk" insurance. This insurance shall include the interests of the Public Works Commission, the Contractor and Subcontractors and shall be written on a one hundred percent (100%) completed value basis (full value as of the date that all construction is finished and includes the Contractor's total cost plus profit), and to remain in force until the project is completed and accepted by the Public Works Commission.
 - e) Regardless of the nature of the work to be performed, coverage must also be provided for the theft or damage of building materials and supplies, which are not permanently attached and stored on site for any period of time. This coverage shall be an "Installation Floater," and where no building construction is involved, the amount of the coverage shall equal the value of the materials stored on site.
 - f) It is the responsibility of the Contractor to inform the policy provider of any and all change orders which increase the building's value. Any penalties or losses incurred due to the Contractor's failure to adequately insure the building during construction will be the Contractor's responsibility.
- 2) Acceptability of Insurance
 - a) All insurance policies shall be written by insurers licensed to do business in North Carolina. It is realized that certain business activities may not be readily insurable by admitted carriers. If insurance is written by non admitted carriers whose names appear on the current listing of approved and non-admitted carriers prepared by the North Carolina Department of Insurance, such carriers will be favorably considered assuming they meet all other requirements. Non admitted carriers should be so identified on the Certificate of Insurance form. The Public Works Commission reserves the right to reject any and all certificates or policies issued by insurers with a Best's rating less than "A".

3) Indemnity Provision

- a) Contractor assumes entire responsibility and liability for losses, expenses, demands and claims in connection with or arising out of any injury, or alleged injury (including death) to any person, or damage, or alleged damage, to property of the Public Works Commission or others sustained or alleged to have been sustained in connection with or to have arisen out of or resulting from the negligence of the Contractor, his subcontractors, agents, and employees, in the performance of the work/service set forth in these Contract Documents, and any changes, addenda, or modifications including losses, expenses or damages sustained by the PWC, and agrees to indemnify and hold harmless the PWC, its officials, employees or volunteers from any and all such losses, expenses, damages, demands and claims and agrees to defend any suit or action brought against them, or any of them, based on any such alleged injury or damage, and to pay all damages, cost and expenses in connection therewith or resulting there from. As an integral part of this agreement Contractor agrees to purchase and maintain during the life of this contract contractual liability insurance in the amount required in the general liability insurance requirements and to furnish proper evidence thereof.

4) Other Provisions:

- a) Any deductible or self-insured retention must be declared to and approved by the Public Works Commission.
- b) The policies are to contain, or be endorsed to contain, the following provisions:
- i) Commercial General Liability Coverage
- (1) The Public Works Commission, its officials, employees and volunteers are to be covered as additional insured as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, leased or used by the Contractor; or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Public Works Commission, its officials, employees or volunteers.
- (2) The Contractor's insurance coverage shall be primary insurance as respects the Public Works Commission, its officials, employees and volunteers. Any insurance or self insurance maintained by the Public Works Commission, its officials, employees or volunteers shall be excess of Contractor's insurance and shall not contribute with it.
- (3) Coverage shall state that Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.
- ii) All Coverages
- (1) Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after 30 calendar days prior written notice by certified mail, return receipt requested, has been given to:
- Public Works Commission
Attn: Gloria B. Wrench, Procurement Manager
P.O. Box 1089
Fayetteville, NC 28302-1089
- (2) Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the Public Works Commission, its officials, employees, and volunteers. In the event the Public Works Commission is damaged by the failure of the Contractor to maintain such insurance and to so notify the Public Works Commission, the Contractor shall bear all reasonable costs properly attributable thereto.
- iii) Subcontractors

- (1) Contractor shall include all subcontractors as insurers under its policies OR shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.
- iv) No Waiver of Immunity
 - (1) Any insurance coverage required by the terms of this contract shall not be deemed a contract of insurance purchased by the Public Works Commission nor a waiver of the Public Works Commission's immunity pursuant to NCGS 160A 485.

5. Contractor Responsibilities

All work required on the plans, specified herein or as directed by the PWC in the field to satisfactorily complete the above project is the Contractor's responsibility. The Contractor shall be responsible for performing any excavation and grading, furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the work, leaving the site in a neat and satisfactory condition.

Until final acceptance by the PWC, the project site and all the Work shall be the responsibility of the Contractor. The Contractor shall take every precaution to prevent damage to the project site, Work, and the surrounding areas. It shall be the responsibility of the Contractor to address any damage or injury arising from their direct or indirect performance on this project. The Contractor shall be responsible for maintaining the project site at all times, as required by these Contract Documents. The Contractor shall also be responsible for ensuring that the Work is installed and maintained in accordance with these Contract Documents until accepted by the PWC. This paragraph does not supersede the requirements of the general warranty.

6. Guarantee

All work completed under these Contract Documents shall be guaranteed by the Contractor for a period of one (1) year from the date of final acceptance, unless otherwise stated in the Special Conditions of these Contract Documents. During that period, all serious defects discovered in the work, as determined by PWC, shall be removed and replaced in a satisfactory manner by the Contractor at no cost to PWC. PWC may conduct an independent inspection of the completed work prior to the completion of the guarantee period. This independent inspection will be at the sole expense of PWC.

Should PWC's inspection determine that the work is not in accordance with these Contract Documents; the Contractor shall mobilize and make all necessary repairs at no expense to PWC. The Contractor will receive written notification from PWC, and will be allowed to review any available inspection pictures or other documentation. The Contractor shall respond to PWC with a plan of action within 30 calendar days of receiving notification. The Contractor shall mobilize and begin to complete the work within 60 calendar days of receiving notification. The Contractor shall:

- a) Repair defective land or areas.
- b) Correct defective Work, or if the defective Work has been rejected by the PWC Project Engineer, remove it from the project and replace it with Work that is not defective.
- c) Satisfactorily correct, repair, remove, or replace any damage to other Work, damage to the work of others, and damage to other land or areas.

If the Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, PWC reserves the right to contract with another party to complete the warranty work, at the sole expense of the Contractor. All claims, costs, losses, and damages (including but not limited to all fees and charges or design professionals, attorneys, and other professionals and all court, arbitration or other dispute resolution costs arising out of or relating to such correction or repair or such removal and replacement of work of others) shall be paid by the Contractor.

The warranty period stated is specifically for the work installed by the Contractor. Any collateral damage discovered during the warranty period will be investigated and the Contractor will be required to respond if the damage is determined to have occurred during the construction process.

7. Discovery of Defects

The Contractor warrants and guarantees to PWC, that all work will be in accordance with these Contract Documents, will not be defective, and that all materials and equipment used for the work are appropriate for the Project. PWC shall provide prompt notice of all defects to Contractor upon discovery. All defective work, whether or not in place, may be rejected, corrected, or accepted, at PWC's sole discretion.

PWC reserves the right, should an error be discovered in the estimate or conclusive proof of defective work or materials used by or on the part of the Contractor be discovered either before or after the final payment has been made, to claim and remove by process of law such sum or sums as may be sufficient to correct the error or make good the defects in the work and materials.

8. Payments

Prior to the Contractor submitting an application for payment, the Contractor and PWC shall review and agree on all items and quantities for which the Contractor is requesting payment. **Each pay request shall contain a certificate documenting any sales tax paid by the Contractor for that billing period.** A certified form is required even if no sales tax was paid for that pay request period.

The Contractor is strongly urged to submit draft pay applications to PWC prior to submittal of the official pay application. Draft pay applications can be either emailed or faxed.

The pay application shall have a cover sheet similar to AIA Form G702 (or approved equal) that summarizes the contract value, any change orders, and work completed to date. The Contractor shall furnish two (2) copies (one original and one copy) of the pay application package. The Contractor shall include copies of all invoices claimed on the sales tax certification.

Retainage – In accordance with N.C.G.S. 143-134.1, the PWC will retain 5% of the amount of each monthly periodic payment. The PWC may, after 50% of the work has been completed, consider waiving further retainage on the project upon the following conditions:

- a) Written consent of surety is received;
- b) Satisfactory progress is being made on the Project; and
- c) Prior to 50% completion, any nonconforming work identified in writing by the PWC has been corrected by the Contractor and accepted by the PWC.

If retainage is discontinued or reduced, the PWC reserves the right to reinstate retainage up to the 5% level if the Contractor performs unsatisfactorily. Furthermore, the PWC reserves the right to continue to retain payment, even in the event the Contractor's work is satisfactory, in order to ensure a total of 2.5% retainage over the life of the project. The PWC reserves the right to withhold additional payments for unsatisfactory job progress, defective construction not remedied, disputed work, or third-party claims filed against the PWC or reasonable evidence that a third-party claim will be filed.

9. Customer Service

Exemplary customer service shall be incidental to this Contract and no additional payment will be made for this service. The Contractor shall make every effort to reduce the impact to customers in and near the project area. Additionally, the Contractor shall make every effort to reduce the impact on the day-to-day operation of the PWC's water and sewer systems.

The Contractor shall respond promptly to any concerns voiced by customers and/or PWC personnel and shall make every effort to resolve them immediately. The Contractor shall cooperate fully with PWC personnel and customers.

The Contractor shall at all times cooperate with the public and merchants affected by the construction and shall endeavor to maintain good public relations at all times.

10. Emergency Response

The Contractor shall maintain a construction crew capable of performing emergency maintenance work 24 hours a day, seven (7) days a week, including all holidays. As a minimum, phone numbers shall be furnished for at least three (3) individuals in responsible charge (capable of making company binding decisions) to be available 24 hours a day, seven (7) days a week, including holidays. The emergency phone numbers and responsible individual's names shall be furnished to the PWC at the pre-construction conference. The Contractor's designated emergency personnel shall be expected to respond and perform emergency maintenance work immediately, in less than two (2) hours, or the work will be performed by others and all associated costs shall be deducted from the Contractor's payment.

The Contractor shall notify the PWC Dispatcher (910-678-7400) of the problem, the anticipated response time, and the estimated time required to complete the repair work. If the Contractor does not notify the Dispatcher when the work will be completed, a PWC crew will make the necessary repairs or alternate measures will be taken at the Contractor's expense.

11. Working Times

The Contractor shall limit operations to Monday through Friday, during normal business hours. Regular working hours shall not exceed 40 hours per week, 8 hours per day (between 7:00 a.m. and 5:00 p.m.), Monday through Friday. No Work is permitted on legal Holidays (to include holiday weekends). No Work, unless otherwise required due to an emergency and authorized by the PWC, shall be performed on weekends or after hours without prior written approval from the PWC. Requests to work other than regular working hours must be submitted in writing to the PWC a minimum of two (2) business days in advance in order to arrange for appropriate personnel to be at the site of the Work. Requests shall only be approved if the PWC determines that the work is necessary in order to meet the contract completion date. The written request shall include a proposed schedule for the Work to be completed.

During the course of construction, it may be necessary to complete portions of the Work outside of the normal working hours to accommodate other utilities, traffic, and/or public convenience. The Contractor, PWC, and any applicable third-party will determine an acceptable schedule required for Work during such hours. The costs for such Work shall be considered incidental to the Project and no additional payment will be made.

Legal holidays observed by the PWC include New Year's Day, Martin Luther King's Birthday, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving (2 days), and Christmas (2 days).

The Contractor shall properly plan and schedule all activities to comply with this section. If the Contractor fails to properly plan and complete activities within the times indicated, PWC will issue a Non-Compliance Notice.

Inspector Overtime shall be charged if the Contractor works beyond regular working hours, to include weekends. The overtime will be charged at a rate of \$100.00 per hour. Inspector overtime may be waived for circumstances beyond the Contractor's control, as deemed by the PWC Project Engineer or Project Coordinator.

12. Limits of Construction

The Contractor shall confine operations to permanent easements, temporary construction easements or existing street rights-of-way. The Contractor may use additional area for staging, storage or other operations, provided that written permission is obtained from property owners, and all disturbed areas are restored.

13. Resident Notification of Work

Whenever a customer's use of the water or sanitary sewer must be interrupted by the Work, the Contractor shall notify the resident well in advance of the interruption. This shall be a minimum of 48 hours prior to service

interruption. **Service interruptions to customers shall be limited to no more than eight (8) hours at any given time.** The Contractor shall make every effort to minimize inconvenience to the public and customers.

Notification shall be accomplished with door hanger notification cards placed at the addresses of the affected customers. The notification shall describe the work to be undertaken and approximate dates of the work. The text of the notifications may be provided by the PWC or, if provided by the Contractor, shall be approved by the PWC in advance. **All text on the notification cards shall legible and clear.** The cards shall state what services are being interrupted, when the interruption will begin, and the length of time the customer should expect to be without service.

Some customers use a side door or a back door instead of the front door. For this reason, the door hanger cards shall be placed on the door that appears to receive the most customer traffic. If the active door cannot be determined, multiple cards shall be used.

14. Encumbrances by Residents

The Contractor shall visit all locations proposed for work and notify residents, in writing, of any conditions which would prevent accomplishment of the work, such as fences, vehicles, or dogs pens. If encumbrances exist, the Contractor shall document existing site conditions (picture and/or video) prior to construction, and provide a copy to the PWC. These photographs and videos may be used for purposes of restoration documentation.

15. Agreements with Property Owners

Any and all agreements between the Contractor and individual property owners for work, services, rent of staging areas, etc. located outside of any easements or public rights-of way shall not obligate the City of Fayetteville (City) or the Public Works Commission in any manner. Prior to performing any work on private property, which could remotely infer the Contractor acting on behalf of the Public Works Commission, the Contractor shall furnish to the Public Works Commission a signed and witnessed statement executed by the Property Owner acknowledging that the City and the Public Works Commission are not liable for any agreements between the Property Owner and the Contractor, and that the Contractor shall hold harmless and defend the City and the Public Works Commission from all claims, damages, etc. Additionally, the Contractor shall have the responsibility to secure any and all agreements with property owners for any actions taken by their Subcontractors.

Prior to release of final payment, the Contractor shall obtain written releases from the property owners for satisfaction, completion, and restoration. Copies of those written releases shall be submitted to Public Works Commission with the final pay application.

The Contractor bears complete responsibility for any damage to private properties outside of the PWC easements and/or rights-of-way.

16. Protection of Property and Plantings

The Contractor shall protect property to the maximum extent practicable during all phases of the Work. Ornamental shrubbery and tree branches shall be temporarily tied back to avoid damage. Trees that receive damage to branches shall be trimmed to improve the appearance. Damaged trunks shall be treated with a tree dressing.

Upon request from the property owner, the Contractor shall remove and set aside those plantings identified by the property owner to be salvaged. All plantings to be salvaged shall be placed at the edge of the existing easement. It will be the property owner's responsibility to re-plant those items saved.

17. Equipment

The Contractor shall utilize equipment adaptable for the type of construction required. All such equipment shall be of sufficient capacity perform the work shown and specified in an expeditious and safe manner, in accordance with the best practices.

The PWC reserves the right to deny the use of inadequate equipment or of equipment not capable of performing the work in an acceptable manner.

18. Materials

All materials used in the work shall be in new condition. Materials shall be stored in strict accordance with the manufacturer's directions. Materials shall be of the type and brand specified within these Contract Documents. **No alternative or substitute materials shall be considered prior to award of the Contract.**

The Contractor shall submit all requests to use materials other than specified to the PWC for review. The Contractor shall be responsible for providing all required documentation necessary for the PWC to review and make a determination if the substitute material meets the required specification.

The Contractor will be responsible for providing documented proof that the proposed substitution has a proven record of performance when used in the intended application as confirmed by actual field test(s) or by successful installations. The PWC reserves the right to reject any such proposed changes or substitutions at their sole discretion, and is under no obligation to justify their decision.

19. Erosion and Sedimentation Control

The provisions of Chapter 139, North Carolina Statutes as amended, Soil Erosion and Sedimentation Control shall be applicable to this project. The Contractor shall adjust the measures to complement operations and prevent the transmittal of silt. All necessary erosion control measures shall remain serviceable until the site is restored and stabilized. Upon such time, the Contractor shall remove all temporary measures.

All fees, penalties, fines for non-compliance and all civil actions resulting there from shall be the Contractor's responsibility and shall in no way involve the PWC. The Contractor shall immediately notify the PWC of any fine, penalty, or notice of non-compliance by the North Carolina Department of Environmental Quality (NCDEQ). The Contractor may be required to modify or supplement the measures at no additional cost to the PWC.

In addition to installing and maintaining the appropriate erosion control devices, the Contractor shall maintain a neat and clean jobsite. The Contractor shall take the necessary measures to minimize dust, ensure the streets are clean and free of debris, and other measures as required. The Contractor shall maintain the proper erosion control devices to ensure against erosion. The Contractor shall ensure that the catch basin and inlet protection devices are free of dirt and debris.

Permanent and temporary erosion control measures proposed by the Contractor for staging areas, haul roads, etc. shall be at the Contractor's expense and shall not constitute additional compensation.

20. Traffic Control

The Contractor shall provide any and all traffic safety measures as required to satisfy local, state, and federal highway requirements. The Contractor, when working in public rights-of-way on streets open to vehicular traffic, shall be required to maintain temporary traffic control devices to reduce unnecessary congestion and unsafe traffic conditions. All traffic control measures shall be in accordance with the appropriate municipal or state authority. It shall be the Contractor's responsibility that all requirements set forth by the appropriate agency are adhered to through the duration of the project.

The Contractor shall be liable for any damages resulting from negligence and inadequate work zone traffic control. Furthermore, the PWC Project Engineer or his representative(s) reserves the right to stop any work for non-compliance.

The Contractor shall coordinate activities so as to minimize disruption of traffic and inconvenience to residents and the general public. All such traffic control devices, traffic patterns and road closures shall be approved by the appropriate municipal or state authority.

Failure to provide and maintain adequate traffic control devices may result in the PWC's refusal to make payment until corrective measures are in place. Improper signage and traffic control devices will not be allowed. The PWC reserves the right to relocate and/or remove such non-conforming signs and devices, setup proper signage to ensure public safety and deduct all costs for these items which may be incurred by the PWC. The Contractor shall make no claim for such work performed.

21. Excavation

The Contractor shall be responsible for utilizing all measures necessary to comply with the applicable OSHA regulations.

Before excavating, the Contractor shall contact the NC One-Call Center for the location of existing utilities within the project area. Costs of utility repairs, temporary service and other costs arising out of damage to or interruption of utilities, resulting from operations under this contract, shall be borne by Contractor at no additional cost to the PWC.

Where the excavation is in pavement, the Contractor shall sawcut and remove asphalt or concrete pavement within the limits of allowable trench width. Where the excavation is within grassed easement areas, the Contractor shall take care to minimize disturbance and/or removal of trees, shrubs, bushes, etc.

22. Confined Space

Prior to entering manholes or other areas that are defined as confined spaces, the Contractor shall follow all requirements and procedures as outlined by OSHA's Confined Space Entry requirements. A confined space entry program shall be included as part of the Contractor's Safety Plan.

23. Cleanliness During Construction

The Contractor shall perform a daily clean-up of all dirt, debris, scrap materials and other disposable items resulting from the Contractor's operations, whether on-site or off-site. The Contractor shall remove all construction equipment, barricades, tools, surplus materials, etc. no longer required at the site. No open accumulation of refuse, surplus or scrap materials will be permitted. The Contractor shall legally dispose off-site all waste materials and other excess materials resulting from construction. No separate payment shall be made for maintaining a clean project site.

Failure of the Contractor to maintain a clean site will be basis for PWC to issue a written notice of non-compliance. If the Contractor does not take corrective measures within twenty-four (24) hours, PWC may authorize the cleanup to be performed by others, and the costs shall be deducted from monies due the Contractor.

24. Disposal of Debris

The Contractor shall properly dispose of all debris resulting from operations, in accordance with applicable Federal, State, and local laws, regulations, and rules.

The Contractor shall take all necessary precautions to prevent debris and other items related to their construction efforts from entering the sewer and/or water system.

25. Disposition of Surplus Property

All property which is surplus to the needs of the project will remain or become the property of the Contractor, unless otherwise stated in the plans or Contract Documents. All property belonging to the Contractor shall be removed from the project by the Contractor prior to final acceptance.

26. Site Restoration and Cleanup

Upon completion of a section of work, the project location shall be cleaned up and grounds restored to the conditions that existed prior to commencing work. All restoration work shall be completed prior to commencing

another section of work. Restoration includes, but is not limited to, seeding, mulching, placement of sod, replacement of fences, and patch paving.

In those areas where an established stand of grass is disturbed due to the construction activities, the Contractor shall restore that area with sod. All other non-paved areas shall be seeded and mulched.

Surplus material, tools, and temporary structures shall be removed by the Contractor. All dirt, rubbish, and other debris from the operation shall be removed and legally disposed of by the Contractor, at no additional cost to the PWC.

The Contractor is to replace any fencing disturbed as part of their operations. Replacement of fencing is considered incidental to the operation, and no additional payment will be made for this work. In addition, if temporary fencing is required, the Contractor shall provide such fencing as necessary, at no additional cost to the PWC. Fences shall be removed and replaced, using new materials as required, to restore the item to the original condition or better.

27. Bulk Water Usage

The PWC will allow the Contractor to use water from the existing water system. The Contractor shall contact PWC's Environmental System Protection Department at 910-223-4699 to determine the required backflow prevention devices, and to obtain a bulk water permit. The Contractor shall utilize proper backflow prevention devices when obtaining water from the PWC's system or any other potable source. The Contractor shall be responsible for all permit fees. The Contractor shall provide documentation on the amount of water used and provide a monthly statement to the PWC.

28. Warranty Against Patent/License Agreements

The Contractor shall warrant to the PWC that the equipment used on this Contract, where covered by patents or license agreements, is furnished in accordance with such agreements and that the prices included herein cover all applicable royalties and fees in accordance with such license agreements. The Contractor shall defend, indemnify, and hold the PWC harmless from and against any and all costs, loss, damage, or expense arising out of or in any way connected with any claim of infringement of patent, trademark, or violation of license agreement.

29. All Other Laws Apply

All applicable State Laws, Municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout, and they are deemed to be included in the Contract the same as though herein.

30. Indemnification

Contractor shall indemnify and hold harmless PWC and its agents and employees from and against all claims, damages, losses and expenses, including reasonable attorney's fees, arising out of, or resulting from the performance of the work, caused by an act or omission of the Contractor, any subcontractor, and anyone for whose acts any of them may be liable. In cases of concurring fault, each party shall bear his share of the loss. In any and all claims against PWC or any of its agents or employees by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone of whose acts any of them may be liable, the indemnification obligation under the preceding paragraph shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Contractor or any subcontractor under Worker's Compensation Acts, disability benefit acts or other employee benefit acts.

31. Termination

The PWC reserves the right to immediately terminate this contract, if during the progress of the work or during the warranty period, the Contractor:

- a) Persistently fails to prosecute the work properly and in accordance with this contract (to include failure to provide sufficient crews, equipment, or resources, failure to adhere to the schedule, etc.),
- b) Demonstrates disregard for the policies, procedures, and requirements of the PWC,
- c) Demonstrates complete disregard of the authority of the PWC and their designated representative, or
- d) Violates in any substantial way the provisions and requirements of this Contract.
- e) Such termination shall be made in writing, upon providing seven (7) calendar days notice to the Contractor and their surety.

Additionally, the PWC may terminate the Contract for its convenience. In such instance, the Contractor will be notified seven (7) calendar days prior, and will be paid for all work completed, plus other expenses as mutually agreed upon with the PWC.

01000 – SPECIAL CONDITIONS

1. Pre-Construction Conference

There will be a Pre-Construction conference following the issuance of Notice of Award. PWC will contact the Contractor to establish a mutually agreeable date and time to conduct the conference. The purpose of the conference is to discuss general project items, including, but not limited to:

- a) Contractor's responsible person and contact information
- b) Emergency contact information
- c) Submittal schedule and requirements
- d) Contract requirements
- e) Safety
- f) Construction sequence
- g) Notice to Proceed
- h) Project schedule
- i) Sales Tax Certificate
- j) Applications for Payment
- k) Warranty requirements
- l) Site restoration and clean-up

2. Submittals

The Contractor shall not perform any portion of the Work requiring submittal and review until the respective submittal has been approved by PWC.

The Contractor shall submit to PWC five (5) copies of all required submittal data for review and approval. The Contractor shall furnish, prior to use of the materials, satisfactory written certification of his compliance with the manufacturer's standards for all materials, conformance with the methods of the manufacturer, and accordance with all standards specified and referenced within these specifications.

If requested by PWC, the manufacturer of materials, equipment, or product shall submit evidence of having consistently produced materials of satisfactory quality and performance for a period of at least two (2) years.

The Contractor shall provide submittals on the following:

- a) A sample door hanger, notifying the residents of the project and those times that the resident may not have sewer service
- b) Proposed suppliers, material specifications (including SDS), and installation/application methods for the following materials:
 - (i) Infiltration control (hydraulic cement)
 - (ii) Patching mortar for void repair
 - (iii) Cementitious base coat
 - (iv) Epoxy coating
 - (v) Fiberglass fabric
- c) Documentation from the manufacturer(s) that the proposed materials are compatible with each other and suitable for use within a sanitary sewer system.
- d) Certified test reports that the proposed materials for this Contract were manufactured and tested in accordance with the specified American Society for Testing Materials (ASTM) including bond strength data on cured cementitious lining based on ASTM C952
- e) Certification of the lining operator and project supervisor

- f) Certification that the proposed lining equipment has been approved by the lining manufacturer
- g) Certification that the contractor has been trained for the use of the proposed lining equipment
- h) Manufacturer's performance warranty for the proposed liner system
- i) Proposed project schedule
- j) A detailed plan for the bypass pumping operations (if necessary)
- k) Contractor's safety plan, including confined space program
- l) Contractor personnel emergency contact information
- m) Labor and equipment rates
- n) Documentation outlining Contractor's ability to access manholes in easements and areas of difficult access
- o) All submittals for the manhole lining system as outlined in Section 02763 of these Contract Documents

3. Manhole Covers

If a manhole is not in pavement or is on an outfall line, and the manhole does not already have a locking ring and cam-lock cover, the Contractor shall replace the existing ring and cover with a locking ring and cam-lock cover, unless directed otherwise by PWC. Existing rings and covers shall be returned to PWC in exchange for new rings and covers. The Contractor will be required to pick up the new frame and cover at PWC's warehouse facility.

The Contractor shall demonstrate that the installed lining system does not interfere with the proper sealing and locking of the manhole cover. The PWC Project Coordinator shall verify that the manholes are secured.

For all manholes in streets, the Contractor shall secure the covers to the rings to reduce rattling. The Contractor shall apply four (4) dollops of roofing tar to the frame, to eliminate the cover from rattling. The dollops shall be equally spaced around the frame. The roofing tar shall be applied upon successful completion of the spark testing. The PWC Project Coordinator shall verify that the manholes are properly sealed and do not rattle.

4. Manhole Access Tool

The Fayetteville Public Works Commission shall provide the Contractor with a locking ring and cover access tool at the pre-construction meeting. It is the responsibility of the Contractor to return the access tool upon completion of the project. If the tool provided by the Fayetteville Public Works Commission is misplaced/lost the cost to replace it shall be the responsibility of the Contractor.

5. Subcontractors

All lining shall be completed by the prime Contractor utilizing his own forces. Second tier subcontractors shall not be allowed. Violation of this provision of the Contract may be deemed a breach of the Contract.

6. Method of Rehabilitation

The base bid will be based upon utilizing the specified lining system. The lining system shall be installed from the invert to the ring and cover, including the bench/shelf area, and that portion of the invert above the flow line.

The Contractor is advised that the presence or absence of leakage through manhole walls and/or inverts as seen in the Contractor's independent inspection of manholes prior to bidding is dependent upon the ground water levels and conditions at the time of the inspections. The Contractor shall reflect his/her assumptions and judgments on leakage through manhole walls based on this information in the unit prices bid for lining manholes. All leakage shall be stopped prior to lining manholes. No additional payment will be made to the Contractor for repairing leaks not visible prior to bidding or sewer rehabilitation.

Repair of benches and inverts shall be incidental to the work, and no additional payment will be made. Replacement of benches and inverts shall be paid at the unit price in the Bid Form. The Contractor shall not replace benches and inverts without approval from the PWC. All work shall be in accordance with PWC standards and as directed by the Project Engineer.

7. Previous Inspection Reports

The Public Works Commission cannot guarantee that all of the manholes scheduled for rehabilitation have been inspected prior to assigning them to the Contractor. If the manholes have been previously inspected by the Public Works Commission, copies of those inspection reports, pictures, and/or videos will be available for viewing upon request from the Contractor. The Contractor shall schedule an appointment for viewing the information.

8. Availability

The Contractor shall be capable of providing crews as needed to complete the work without undue delay and shall begin work within 15 days from the written Notice to Proceed (NTP).

During the period when the Contractor is performing rehabilitation work, there may be instances where the Public Works Commission desires to have a one or more manholes rehabilitated on an emergency basis. In the event of such an emergency (as defined by the Public Works Commission), the Contractor will receive written notification. Upon receipt of the written notification, the Contractor shall complete the work within 15 calendar days. Should it be determined that the Contractor cannot complete the work within 15 calendar days, the Contractor and Public Works Commission shall determine a mutually acceptable schedule for completing the emergency work.

9. Bypass Pumping

The Contractor shall schedule a coordination meeting with the PWC and other personnel (Contractor, bypass sub-contractor, etc.) a minimum of three (3) business days prior to starting the temporary bypass pumping system. The purpose of this coordination meeting is to ensure that the Contractor and their sub-contractors have a good understanding of the requirements and expectations of operating the temporary bypass pumping system, discuss contingency plans (to include protocols for emergency contacts), identify location(s) of pumps, verify necessary materials (repair sleeves, containment devices, etc.) are on-site and available, and any other items necessary to ensure that the PWC has confidence that the appropriate personnel can operate and maintain the temporary bypass pumping system. Should, for any reason, the PWC deem that the Contractor and/or their sub-contractor is not prepared to operate and maintain the temporary bypass pumping system, the temporary bypass pumping system shall not be started. The Contractor shall take all necessary steps to address any concerns to the satisfaction of the PWC. Upon completion of those actions, another coordination meeting shall be held, in order for the PWC to confirm that the Contractor and their sub-contractor is prepared to operate and maintain the temporary bypass pumping system. This process will be repeated until the PWC is satisfied that the Contractor and their sub-contractor are prepared to operate and maintain the temporary bypass pumping system. No additional contract time will be granted for this delay.

10. Guarantee (Special Provision to General Conditions)

All work completed under these Contract Documents shall be guaranteed by the Contractor and manufacturer for a period of five (5) years from the date of final acceptance. During that period, all defects discovered in the work, as determined by the Public Works Commission, shall be repaired or replaced in a satisfactory manner by the Contractor at no cost to the Public Works Commission. The Public Works Commission may conduct an independent inspection, at their sole expense, of the lining work prior to the completion of the five (5) year guarantee period.

Should the Public Works Commission's inspection determine that the lining system is not in accordance with these Contract Documents; the Contractor shall mobilize and make all necessary repairs at no expense to the Public Works Commission. The Contractor will receive written notification from the Public Works Commission, and be allowed the chance to review any available inspection pictures or other documentation. The Contractor shall respond to the Public Works Commission with a plan of action within 30 calendar days of receiving notification. All proposed repairs shall be submitted, reviewed, and approved by PWC prior to the Contractor beginning work on the repairs. Failure to respond to the Public Works Commission's notification may result in the Public Works Commission

withholding payments to the Contractor. Alternatively, the Public Works Commission reserves the right to contract with another party to complete the warranty work, at the sole expense of the Contractor.

Each manhole assigned to the Contractor under the terms and conditions of this Contract shall be subject to this guarantee.

11. Project Schedule

Each week, the Contractor shall provide the Public Works Commission with his schedule for the upcoming week. The Contractor shall contact the Project Coordinator on a daily basis, to confirm his schedule for that day. The Contractor shall immediately notify the Public Works Commission of any deviations to his schedule. Failure to notify the Public Works Commission of any deviations may result in payment being withheld.

12. Office Facilities

The Contractor shall provide at his expense telecommunications via cellular phone at all times on the job site. The Project Superintendent must be onsite and accessible by telephone at all times while work is progressing. The Project Superintendent shall have access to plans, contract documents, permits, and encroachment agreements at all times whether an office facility is provided by the Contractor or not.

13. Resident Notification of Work (Special Provision to General Conditions)

The Contractor shall not enter back yards, fenced areas, or areas that may be deemed private or personal – regardless of easements or rights of way held by PWC – without consent from the property owner and the PWC Project Coordinator. The Contractor shall coordinate with the PWC Project Coordinator to notify residents a minimum of one (1) week in advance of the need to work in these areas.

14. Areas of Difficult Access

PWC's sewer system spans a wide variety of terrain and soil conditions. Many manholes that are in need of rehabilitation are located in easement areas, where it may not be possible to drive a vehicle to the manhole. Additionally, many of the easement areas are in low-lying areas, with high groundwater tables and/or standing water. Previous contractors have utilized an airboat, boat, and other means to access the manholes.

The Contractor is responsible for gaining access to the assigned manholes, using the appropriate method (e.g., boat, ATV, walking, etc.). The Contractor shall be responsible for determining the method of access for each of the assigned manholes. It is noted that it is not the intent of this Contract for the Contractor to construct access roads to the various manholes. It is the intent that the Contractor shall utilize any necessary method to access the manholes, in lieu of constructing an access road. It is imperative that the Contractor be able to access remote manholes as part of their normal operation. No additional payment will be made for alternative methods of access.

Access to the assigned manholes shall be confined to public rights-of-way or PWC's permanent easement. PWC will provide assistance in attempting to gain permission to cross private property, in the event it is necessary. The Contractor shall coordinate with PWC a minimum of two (2) weeks in advance, in order to gain such access. If it is necessary to utilize private property to access the manholes, the Contractor shall obtain a signed release from the affected property owner(s), stating that the property has been satisfactorily restored. Final payment shall not be released until all signed releases are obtained and submitted to PWC.

The Public Works Commission shall be responsible for clearing the existing easement right-of-way, should it be necessary. The Contractor shall provide the Public Works Commission with a minimum of two (2) weeks notice for any easement clearing.

15. Stored Materials

There will be no payment for stored materials on this project.

16. Staging Areas

The Contractor shall be required to secure staging areas for storing materials, equipment, etc. All costs, such as rent, restoration, erosion control measures, and permit fees shall be the responsibility of the Contractor. The location and operation of the staging yard shall comply with all applicable Federal, State, and local regulations.

Proper measures, to include total secondary containment, shall be used for fuel storage and to prevent spillage. The Contractor shall not stockpile materials or place fill dirt on any lot without approval from the property owner.

Should the Contractor's stockpiles create drainage problems, the Contractor shall construct drainage improvements at his expense as directed by the PWC Project Engineer and/or Project Coordinator, or relocate the stockpile(s).

17. Pre-construction Video of the Site

The Contractor shall complete a pre-construction video inspection of the project area, to document pre-existing conditions, including vegetation, roadside conditions, easement areas, driveways, the condition of the curb and gutter, the condition of the mailboxes, fences, gates, retaining walls, and any other installed improvements. The Contractor may include still pictures of the areas, for additional documentation. The video and any other accompanying data shall be submitted to PWC prior to commencing Work in a project area.

The video shall be in standard digital video file format (i.e., mp4, mpg, or avi) and supplied on standard portable digital media (i.e., USB flash drive, USB hard disk drive, or DVD).

In areas where the Work will disturb multiple yards, driveways, and/or personal property, the video must identify the address of the property in the audio track and visually. The video must be accompanied by an index sheet identifying the streets of the project by time position on the video.

18. Lift Station Operations

There may be several manholes included in this Contract that receive force main discharges. The Contractor shall visit those manholes to verify the need for any coordination regarding operation of the lift station. Any concerns regarding lift station operations and the ability to complete the work as described in these Contract Documents shall be discussed with the Public Works Commission a minimum of two (2) weeks prior to commencing work on those manholes. The Public Works Commission and Contractor shall coordinate as necessary to operate the lift station so that the Contractor can complete the rehabilitation work.

19. Public Safety

The Contractor shall protect the Work to keep the public at large safe from injury. Any damage or injury through the lack of proper protection or from Contractor's negligence shall be the Contractor's sole responsibility.

Steel plates may be utilized at the discretion of the PWC Project Engineer and in accordance with the requirements set forth by NCDOT and the City of Fayetteville.

20. Traffic Control (Special Provision to General Conditions)

Traffic control measures shall be in accordance with NCDOT, the City of Fayetteville, Technical Specification 02500 – Traffic Control, and these Special Conditions.

The Contractor shall coordinate all activities so as to minimize disruption of traffic and inconvenience to the general public. All such traffic control devices, traffic patterns, and road closures shall be coordinated through PWC. The Contractor shall submit all traffic control plans to PWC, who will route the request to the appropriate agency for review. The Contractor shall submit a traffic control plan a minimum of 30 calendar days in advance to allow for review by the appropriate agency. No work shall be done without an approved traffic control plan.

The Contractor shall maintain access to properties at all times. Failure to maintain adequate access will result in all work being stopped until access is made. The Contractor shall not be entitled to additional time or compensation should any delays arise as a result of failure to properly maintain access.

21. Excavations (Special Provision to General Conditions)

Before excavating, the Contractor shall contact the NC One-Call Center (dial 811) for the location of existing utilities within the project area. Costs of utility repairs, temporary service and other costs arising out of damage to or interruption of utilities, resulting from operations under this Contract, shall be borne by Contractor at no additional cost to PWC.

Prior to excavation, the Contractor shall sawcut and remove asphalt or concrete pavement within the limits of allowable trench width. Where the excavation is within grassed easement areas, the Contractor shall take care to minimize disturbance and/or removal of trees, shrubs, bushes, etc.

The excavation for all work included in this project is unclassified unless specifically stated in the Measurement and Payment section of these Contract Documents. The unit prices include all excavation and grading in whatever nature of material may be encountered. No additional payment will be made for excavation of material different from what was anticipated. The Contractor shall investigate and examine the site of the project before preparing and submitting a bid.

All excavations shall be carried to a neat line (except for the minimum space required for work, pipe jointing, caulking, etc.), and to exact finished grade except where otherwise specified (for instance, where rock is encountered in the bottom of the excavation).

The Contractor will be held responsible for proper and adequate shoring and sheeting of all excavations. It shall also be the responsibility of the Contractor to protect all excavations from sloughing off and thus destroying firm soil for footings of any foundations planned or existing, adjacent to excavations carried to lower grade than the bottom of such foundations. Failure to observe this precaution will necessitate such foundations being carried to greater depth for firm footing at the expense of the Contractor for the extra work, time and materials involved; and the PWC Project Engineer shall have the right to determine the manner and extent to which security to the adjacent foundations shall be made.

All excavations shall be covered when not in use. All excavations in the street shall be covered with steel traffic plates and fastened to the pavement, as approved by the controlling agency and the PWC Project Engineer. When required by the controlling agency or the PWC Project Engineer, the plates shall be recessed into the pavement where the top of the pavement is flush with the top of the plates. It may be necessary to surround the pits with concrete barriers if required by the controlling agency.

Excavations outside the streets may be covered with ¾-inch plywood, if approved by the PWC Project Engineer. All excavations shall be protected from pedestrians with heavy-duty orange protective fencing surrounding the pit and reflective drums at each corner.

The Contractor shall be responsible for utilizing all measures necessary to comply with all applicable OSHA regulations. Additionally, the Contractor shall ensure that all excavations comply with PWC Specification Section 02222 – Excavation and Backfilling. The Contractor shall have a trenching and shoring "competent" person on the job at all times when there is an open excavation. Under no circumstance will an employee of the PWC be considered the "competent" person for the operation.

22. Coordination of Work

The Contractor shall maintain unobstructed access to all areas for other Contractors at all times. The Contractor will be required to conduct his operations in a manner that will not interfere with or damage work that is being performed by others. Contractor shall keep other Contractors informed of any necessary operations or activities that may interfere with their work. Contractor shall plan, schedule, and coordinate his operations in a manner which will

facilitate the simultaneous progress of work in adjacent areas and any additional work being performed by others on or adjacent to the site.

Any conflicts or interference that cannot be resolved through direct communication with other Contractors working on the site shall immediately be brought to the PWC Project Coordinator's attention for resolution. The PWC Project Engineer's decisions regarding resolution of conflicts between Contractors shall be final and binding on all parties. Contractor shall not claim extra compensation for delays or hindrances caused by other Contractors unless such delays or hindrances are clear violations of prior coordination agreements.

23. Coordination with Sewer Main Rehabilitation Contractor

Occasionally, the Public Works Commission will assign manholes to be rehabilitated that are on the same section of sewer mains that are being rehabilitated by the sewer main rehabilitation contractor. In most cases, these are larger diameter mains, and are typically placed on a temporary bypass system in order to rehabilitate the mains. The Contractor shall coordinate their operations and schedule with PWC and the sewer main rehabilitation contractor, in order to minimize the amount of time the temporary bypass system is running, and not delay the sewer main rehabilitation contractor from completing their work (e.g., constructing access, cleaning, inspection, etc.) in a timely manner.

The Contractor shall complete all preparation of the manholes prior to the sewer mains being cleaned and rehabilitated. The Contractor shall be responsible for stopping any infiltration entering the manhole from the area between the host sewer main and the sewer main liner. It is noted that the sewer main rehabilitation contractor will be required to install end seals prior to rehabilitating the sewer main, in order to minimize the amount of infiltration.

The Contractor shall be responsible for repairing any damage to the manhole resulting from the sewer main rehabilitation work. Any manhole rehabilitation work that is completed prior to the sewer main rehabilitation will not be tested. PWC will test and accept the manholes upon completion of the sewer main rehabilitation, and after any necessary repairs have been made.

24. Confined Space

Prior to entering manholes or other areas that are defined as confined spaces, the Contractor shall follow all requirements and procedures as outlined by OSHA's Confined Space Entry requirements. A confined space entry program shall be included as part of the Contractor's Safety Plan.

25. Chemical Uses

All chemicals used during project construction or furnished for project operation, whether herbicides, pesticides, disinfectant, polymer, reactant or of other classification, must show approval of either the Environmental Protection Agency or the USDA. Use of all such chemical and disposal of residues shall be in strict conformance with manufacturer's instructions.

26. Hazardous Communication Programs

The Contractor shall be responsible to provide and maintain SDS sheets at the job site at all times. The sheets shall be located in an easily accessible and prominently located area. If the Contractor encounters any materials considered or suspected of being hazardous, the Contractor shall immediately secure the area and contact the Project Engineer for further instructions.

27. Locating Existing Utilities

The Contractor shall adhere to the provisions of the 1985 Underground Damage Prevention Act, North Carolina General Statutes. The Contractor shall contact the NC One Call System (dial 811) for utility locates prior to beginning work in a particular area. The Contractor shall coordinate with property owners if there is a potential of disturbing private lines (such as network cable, irrigation lines, etc.). Additional payment will not be made for costs associated with utility locates.

If utilities are to remain in place, the Contractor shall provide protection during construction operations. The Contractor shall coordinate with utility companies when working in close proximity to their lines and services.

Should uncharted or incorrectly charted piping or other utilities be encountered during excavations, the Contractor shall immediately consult the PWC Project Coordinator or the PWC Project Engineer for directions as how to proceed. The Contractor shall fully cooperate with PWC and other utility companies in keeping respective services and facilities in operation.

PWC shall not be liable to the Contractor for any claims, costs, losses, or damages incurred or sustained on or in connection with locating existing underground installations.

28. Construction around Utility Poles and Guy Wires

The Contractor may be required to perform construction work around utility poles and guy wires. The Contractor shall contact the owner of the utility to coordinate securing the poles during construction. It may be necessary for the Contractor to hire an electrical utility contractor to secure poles. All work outlined in this paragraph shall be at no additional cost to PWC.

29. Damage to Existing Utilities

The Contractor shall take every precaution to guard against any damage to existing structures, pipelines, and/or equipment of the utility owner. Any damage to existing structures and/or pipelines shall be the direct responsibility of the Contractor. Damage shall be replaced and/or repaired by the Contractor as directed by the utility owner, or the value of such deducted from any monies due the Contractor under this Contract.

The utility owner shall supervise the Contractor's operation of all valves, gates, and other equipment. Except in case of emergency, the Contractor shall notify the utility owner a minimum of two (2) business days in advance of the need for operation of valves, gates, and other equipment necessary to allow the work to progress.

The Contractor shall notify the utility owner and the PWC Project Coordinator a minimum of 48 hours in advance to coordinate any proposed service interruption. If an unscheduled service interruption occurs, the Contractor shall immediately notify the utility owner and the PWC Project Coordinator. The Contractor shall immediately commence repairs in accordance with the utility owner's standards.

30. Damage to Existing Sanitary Sewer Facilities

If a sanitary sewer service is damaged as a result of the Contractor's operations, the Contractor shall replace the entire lateral, from the main to the clean-out utilizing ductile iron. Replacement of the lateral includes replacement of the clean-out and re-connecting the service to the customer's existing service, utilizing all necessary fittings. The Contractor may use the existing main to lateral connection, with approval from the PWC Project Coordinator. The PWC Project Coordinator and/or the PWC Project Engineer may waive the requirement to replace the sewer lateral in its entirety at their sole discretion.

If a sanitary sewer main is damaged as a result of the Contractor's operations, the Contractor shall repair the damage in accordance with PWC requirements. The repair shall be in accordance with PWC standard detail S.15, and as directed by the PWC Project Coordinator.

The Contractor shall immediately notify the PWC Project Coordinator when damage occurs. All repairs and replacements shall be in accordance with PWC requirements, and as directed by PWC.

All ductile iron sewer piping and fittings (to include sleeves) shall have an interior coating of Protecto401 or approved equal.

31. Damage to Existing Culverts and Storm Drainage Structures

Any damage to storm drainage structures shall be repaired or replaced, as deemed necessary by the PWC Project Engineer and / or Project Coordinator at no additional cost to PWC. All storm drainage structures and repairs shall be installed in accordance with North Carolina Department of Transportation standards.

32. Damage to Property

The Contractor shall carefully protect from disturbance or damage all private property and property corners. When any damage or injury is done to public or private property, by or on account of any act, omission, neglect, or misconduct in the execution of the Work, or in consequence of the non-execution thereof on the part of the Contractor, the Contractor shall restore, at no cost to PWC, such property to a condition equal or better to that existed prior to construction, or the Contractor shall make good damage or injury in an acceptable manner.

The Contractor shall solely be responsible for damage to property outside the limits of the Work. Any and all additional access rights-of-way shall be the responsibility of the Contractor. The Contractor shall be liable for all damages resulting from access usage.

33. Replacement of Fencing

The Contractor is to replace any fencing disturbed as part of his operations for the work described within these Contract Documents. Fences shall be removed and replaced, using new materials as required, to restore the item to the original condition or better.

34. Restoration

Once construction is completed, the Contractor shall be responsible for restoring the site to as good as, or better than existing conditions. All areas of disturbed soil shall be seeded, unless otherwise noted on the Contract Drawings or as directed by PWC.

The Contractor shall be responsible for the full replacement of any driveways disturbed as part of his operations. Restoration of driveways shall be completed in accordance with the applicable PWC standard detail.

Surplus pipe, material, tools, and temporary structures shall be removed by the Contractor. All dirt, rubbish, and other debris from the operation shall be removed and legally disposed of by the Contractor, at no additional cost to PWC.

35. Testing

All testing shall be in accordance with PWC standards and upon completion of each manhole, the Contractor shall test and visually inspect the completed manhole. Any and all defects noted shall be corrected prior to scheduling a final inspection and test with PWC. An inspection report for each manhole shall be completed by the PWC Project Coordinator. The report shall note the date and time, the manhole facility identification number, and the test results. The Contractor shall initial each report, to indicate concurrence with the results. Copies of the inspection report will be provided to the Contractor.

36. Record Documentation

The Contractor shall furnish digital photographs of each completed manhole to PWC. The digital photographs shall be saved to industry standard format for digital image files (i.e. JPG, TIFF, PNG) and shall be stored on standard digital media (e.g. CD, DVD, USB drive). The digital photographs shall contain the original metadata as recorded by the camera. The metadata shall include the location information (i.e. latitude and longitude) if the camera supports geolocation abilities. The file name of the digital photographs shall include the manhole identification number. The photographs shall depict the following, for each manhole:

- a) The ring and cover, showing the lining at the ring and cover
- b) The completed shelf and invert

- c) The manhole walls
- d) The immediate area around the manhole, indicating that the area is properly restored

At least one of the above pictures shall include an identification card (e.g. an index card) documenting the identification number of the manhole. Photographs of only the identification card will not be acceptable.

37. Final Inspection/Acceptance of Work

When the PWC Project Coordinator deems the project completed and ready for final inspection, the PWC Project Coordinator shall notify the PWC Project Engineer. During the final inspection, any items documented shall be compiled in a final punch list and provided to the Contractor within five (5) business days. The Contractor shall be required to complete each item in the final inspection punch list within 30 calendar days of receipt. Failure to complete the punch list in that time may result in liquidated damages being assessed. The project will not be considered complete until all punch list items are finished and accepted, unless otherwise determined by the PWC Project Engineer. All punch list items shall be completed prior to release of final payment. Once the deficiencies have been addressed to PWC's satisfaction, a final acceptance letter will be issued to the Contractor.

Prior to the final inspection, the Contractor shall complete the following:

- a) All manholes having cam-lock rings and covers shall be locked.
- b) All manholes in streets shall have a minimal application of tar between the ring and cover to reduce rattling
- c) Verify all plugs have been removed.
- d) Complete all restoration.
- e) Complete all required testing.

No separate payment shall be made for this work.

FINAL COMPLETION DOCUMENTATION

Prior to receiving final payment, the Contractor shall complete and/or provide the following:

- a) Complete all punch list items to the satisfaction of the PWC Project Engineer.
- b) Satisfactorily resolve all customer complaints and obtain the required releases.
- c) Provide project photographs, in accordance with these Contract Documents.
- d) Provide project close-out submittals in accordance with these Contract Documents.

38. Claims for Extra Cost

Should the Contractor consider that as a result of any instructions given in writing by the PWC Project Engineer, he is entitled to extra costs above that stated in the Contract; the Contractor shall give written notice to the PWC Project Engineer. The written notice shall be sent to the PWC Project Engineer within seven (7) calendar days after the occurrence of the event and the Contractor shall not proceed with the work affected until further advised, except in an emergency involving the safety of life or property. No claims for extra compensation will be considered unless the claim is made. Extra Work performed by the Contractor, not approved by the PWC Project Engineer in writing shall not be considered for payment.

The Contractor shall not act on instructions received by him from persons other than the PWC Project Engineer and/or the PWC Project Coordinator. Any claims for extra compensation or extension of time on account of unauthorized instruction will not be honored. The PWC Project Engineer will not be responsible for misunderstandings claimed by the Contractor of verbal instructions which have not been confirmed in writing, and in no such case shall instructions be interpreted as permitting a departure from the Contract Documents unless such instruction is confirmed in writing by the PWC Project Engineer.

39. Authorized Changes in the Work

At any time the PWC Project Engineer may request, in writing, that the Contractor submit a proposal (Change Order Request), for a proposed change in the work. Within ten (10) business days after receipt of a written Change Order

Request, the Contractor shall submit to the PWC Project Engineer a written detailed proposal for the change. The detailed proposal shall include an itemized estimate of all costs that will result directly or indirectly from the proposed change and include an assessment of the impact of the proposed change on the overall project schedule. Proposals shall be sufficiently detailed to reasonably permit an analysis of all material, labor, equipment, subcontractor costs, overhead costs, and fees, and shall cover all work involved in the change such as work was deleted, added, changed, or impacted. Each cost category shall be supported with substantiating documentation which may include, but is not limited to, quantity takeoffs, quotations, invoices, cost records, and certified payroll. The Contractor shall limit their mark-up of sub-contractor invoices to five percent (5%). For changes in the work where the Contractor is actually performing the work, the Contractor shall limit their mark-up to 10%, to account for overhead, profit, taxes, etc. If the PWC Project Engineer elects to proceed with the change covered by the Change Order Request, such change will be authorized by execution of a Change Order at a later date. Notwithstanding the Change Order Request, the Contractor shall carry on the Work and maintain the progress schedule. The PWC Project Engineer shall have 20 business days after the receipt of the detailed proposal to respond in writing. Delays in submittal of the written detailed proposal are at the expense of the Contractor.

40. Change Orders

PWC may have changes made in the work covered by the Contract. These changes will not invalidate and will not relieve or release the Contractor from any guarantee given by him pertinent to the Contract provisions. These changes will not affect the validity of the Payment Bond and Performance Bond nor will it relieve the Surety or Sureties of said Bond. All extra work shall be executed under the conditions of the original contract, unless otherwise specified in the approved Change Order.

Except in an emergency endangering life or property, no changes shall be made to the Contract except upon written notice from the PWC Project Engineer authorizing such change, and no claim for adjustments of the contract price shall be valid unless this procedure is followed.

Adjustment in Contract Price stated in a change order shall comprise the total price adjustment due to or owed to the Contractor for the Work or changes defined in the Change Order. By executing the Change Order, the Contractor acknowledges and agrees to the Change Order, incorporating all cost and delays associated with the interruption of schedules, extended overheads, delay, and cumulative impacts or ripple effect, on all work under this Contract. Signing of the Change Order constitutes full and mutual accord and satisfaction for the adjustment in the contract price as a result of increases or decreases in costs and time of performance caused directly and indirectly by the change. Execution of the Change Order represents an equitable adjustment to the contract price and that the Contractor waives all rights to claim further adjustments related to the Change Order.

If during the progress of the Work, the PWC Project Engineer requests a change order and the Contractor's terms are unacceptable, the PWC Project Engineer without prejudice may perform or have performed that portion of the work requested by others or with PWC's own forces.

41. Payments (Special Provision to General Conditions)

The Contractor shall submit monthly applications for payment unless the Contractor chooses to extend the billing period with concurrence from PWC. Monthly payment application shall be based on work completed as of the last Friday of the previous month. Retainage withheld by PWC shall be in accordance with the General Conditions of these Contract Documents.

Final payment and release of retainage will not be made until:

- a) All testing requirements have been satisfactorily met,
- b) PWC has completed a final inspection of the work,
- c) All deficiencies noted in the final inspection have been satisfactorily addressed,
- d) All necessary site restoration has been completed, and
- e) All required documentation (reports, release of liens, Property Owner release, etc.) has been submitted.

01025 – MEASUREMENT AND PAYMENT

This section defines the methods of measurement and payment for each of the prices listed in the Proposal. The price bid shall be full compensation for the work required under each bid item, which shall include all incidental costs relative thereto.

General Construction Pay Items

1. Mobilization and Demobilization

A mobilization pay item is included for all initial costs incurred prior to beginning work on this Contract, including permits, licenses, fees, insurance, bonds, etc., as well as to mobilize personnel and equipment. Payment will be made on a lump sum basis and one time only for the duration of a Contract period.

For each contract renewal, the Contractor shall submit invoices from the surety and insurance companies, verifying continued bonding and insurance coverage. Payment will be made for this expenditure, up to but no more than, the price bid for Initial Mobilization.

The Contractor will be paid only for mobilizing to the first project of the Contract or renewed Contract at the unit price bid. The Contractor will not be paid to mobilize from project to project. However, if the Contractor completes all assigned projects and completely de-mobilizes from the Contract, and work is assigned at a later date, the Contractor will be paid to re-mobilize to the next project at the unit price bid for Mobilization.

2. Bench And Invert Replacement

Measurement shall be based on the actual number of manhole bench and/or inverts that are replaced. Payment shall be made at the Contract unit price per each, regardless of whether the entire bench and invert are replaced, for either the bench or invert. The unit price shall include removal of the existing bench and/or invert, bench and/or invert cleaning and preparation, removal of all unsuitable material, flow control for active sewer mains and/or laterals (if necessary), rebuilding the bench and/or invert in accordance with PWC standards, clean-up, capture and proper disposal of all debris and excess material, as well as all labor, materials and equipment necessary to complete bench and invert replacement prior to the installation of the manhole lining system.

Replacement of the bench and/or invert shall be at the direction of the Public Works Commission. **In no case shall this line item be used without consent from the Public Works Commission.** The Contractor shall provide evidence that this line item is necessary and submit it to the Public Works Commission for approval. Upon approval from the Public Works Commission, the Contractor shall proceed with utilizing this line item. All other items related to manhole cleaning and preparation, and/or repairs shall be paid for in accordance with the appropriate Contract bid item.

3. Cover And Frame Resetting

Measurement shall be based on the actual number of frames and covers re-set. Payment shall be made at the Contract unit price per each. The unit price shall include cutting and removal of surface materials as necessary (including asphalt and concrete), removal of existing cover and frame materials, cleaning of cover and frame assembly, safe handling and storage of the cover and frame, repair and preparation of manhole corbel or concrete surface as required, removal of existing concrete grade rings, installation of new concrete grade rings, re-installing the frame and cover in accordance with PWC requirements, reinstatement of surface, to include pavement patch, clean-up and proper disposal of all debris and excess material, as well as all labor, materials, and equipment necessary to complete the resetting of manhole cover and frame assemblies. Should PWC deem that the existing frame and cover need replacement, PWC shall provide a new cover and frame to the Contractor. The Contractor shall return the existing ring and cover to the Public Works Commission, in exchange for a new ring and cover. The

Contractor will be required to pick up the cover and frame at PWC's warehouse facility. No extra compensation shall be given for the Contractor to travel to/from the PWC warehouse.

4. Install Locking Ring And Cover

Measurement shall be based on the actual number of locking ring and covers installed. Payment shall be made at the Contract unit price per each. The unit price shall include removal of the existing ring and cover, any necessary excavation to remove and/or install the ring and cover, preparation of the concrete surface as required, installing the ring and cover in accordance with PWC requirements, clean-up and proper disposal of all debris and excess materials, removal of existing concrete grade rings, and all labor, materials, and equipment necessary to complete the installation of a locking ring and cover. PWC shall furnish the locking ring and cover. The Contractor shall return the existing ring and cover to the Public Works Commission, in exchange for the new locking ring and cover. The Contractor will be required to pick up the cover and frame at PWC's warehouse facility. No extra compensation shall be given for the Contractor to travel to/from the PWC warehouse.

5. Chimney Seals

Measurement shall be based on the actual number of chimney seals installed. Payment shall be made at the Contract unit price per each. The unit price shall include cleaning and preparing the manhole walls, corbelling, and manhole cover frame, furnishing and installing each chimney seal, clean-up, and all labor, materials, and equipment to install a chimney seal in accordance with the manufacturer's instructions and these Contract Documents.

Chimney seals shall be installed when the manholes are in paved areas. In non-paved areas, chimney seals shall be installed as directed by PWC.

6. Rehabilitate Manholes Utilizing Fiberglass Reinforced Epoxy (Vertical Foot Basis)

Measurement shall be based on the number of vertical feet the lining system is installed, in a four (4) foot diameter manhole. Measurement shall be from the manhole invert to the bottom of the manhole frame. Payment will be made at the Contract unit price per vertical foot.

The unit price shall include cleaning the manhole wall, bench, and invert, furnishing and installing all materials comprising the protective lining system from the invert to the bottom of the manhole frame, saw cutting to tie-in the liner at the bench/invert, capture and proper disposal of debris, manufacturer's representative's presence or assistance if required, traffic control, necessary erosion control measures, restoration, testing, hand application of hydraulic cement or other approved material to stop leaks, flow control for active sewer lines and/or laterals, plugging or blocking abandoned mains and/or laterals, and all other labor, materials, equipment, and incidentals necessary to obtain a watertight, sealed manhole. Lining shall include the walls, bench, and invert.

7. Rehabilitate Manholes Utilizing Fiberglass Reinforced Epoxy (Square Foot Basis)

Measurement shall be based on the number of square feet the lining system is installed, for manholes with a diameter greater than four (4) feet. The number of square feet shall be calculated from the depth and perimeter. The depth shall be determined as the vertical distance from the invert to the bottom of the ring. The perimeter shall be calculated from the nominal manhole diameter (4 ft, 5 ft, 6 ft, etc).

If a manhole consists of more than one nominal diameter, the total number of square feet for that manhole shall be calculated by finding the number of square feet for each section of consistent diameter. Payment will be made at the Contract unit price per square foot.

The unit price shall include cleaning the manhole wall, bench, and invert, furnishing and installing all materials comprising the protective lining system from the invert to the bottom of the manhole frame, saw cutting to tie-in the liner at the bench/invert, capture and proper disposal of debris, manufacturer's representative's presence or assistance if required, traffic control, necessary erosion control measures, restoration, testing, hand application of hydraulic cement or other approved material to stop leaks, flow control for active sewer lines and/or laterals (if

necessary), and all other labor, materials, equipment, and incidentals necessary to obtain a watertight, sealed manhole. Lining shall include the walls, bench, and invert.

8. Abrasive Blast Cleaning

Measurement shall be based upon the number of manholes necessary to utilize an abrasive blast cleaning to remove an existing liner material. Payment will be made at the Contract unit price per each. The unit price shall include necessary cleaning to remove existing manhole lining systems necessary to prepare the manhole to be rehabilitated under this Contract. Abrasive blast cleaning shall only be applied to those areas of the manhole where normal cleaning is insufficient to remove the existing liner system. Typically, the existing lining system is a coal tar epoxy. Payment shall include all necessary labor, materials, and equipment to perform the abrasive blast cleaning prior to installation of the manhole lining system.

In no case shall this line item be used without consent from the PWC. The Contractor shall provide evidence that this line item is necessary and submit it to PWC for approval. Upon approval from PWC, the Contractor may proceed with utilizing this line item. All other items related to manhole cleaning and preparation shall be paid for in the applicable line item.

9. Remove And Replace Inside Drop Structure

Payment for removal and replacement of existing inside drop connections in manholes will be measured by actual count, complete, in place, at the Contract unit price bid as listed on the Bid Form. Payment shall be full compensation for all labor, equipment and materials required, including manhole connections, flexible boots, pipe and fittings, couplings, stainless steel straps and bolts, wedges and all incidental work necessary to provide a complete new inside drop connection in accordance with PWC standards.

APPENDIX A – TECHNICAL SPECIFICATIONS

**DIVISION 2
SITE WORK**

02272 EROSION CONTROL - GENERAL PROVISIONS

GENERAL

The Contractor shall be responsible for conducting his site grading and drainage operations in such manner as to prevent or lessen excessive soil erosion of the construction site work areas. He shall at all times provide satisfactory means to prevent or minimize the movement and washing of large quantities of soil. The Contractor is expected to review his site grading and drainage operations periodically to determine the areas most susceptible to erosion by excessive rainfall and periodically maintain all installed measures for the project duration. The Contractor shall correct any deficiencies or problem areas as directed by the Owner or the North Carolina Department of Environment and Natural Resources (NCDENR) inspector within 48 hours.

EXECUTION

The Contractor's attention is directed to the fact that unless exposed earth areas are properly cared for during construction, they may result in substantial sedimentation damage downstream from the construction area. He shall at all times provide satisfactory means to prevent or minimize the movement and washing of quantities of soil onto pavements or into adjacent ditches, swales, inlets, and drainage pipes, to avoid the possibility of these structures becoming clogged with soil. Should this happen as a result of erosion at the site of this construction, the Contractor will be required to immediately provide means for removal of the soil and/or debris from the structures to restore the proper functioning of these structures. The Contractor shall assume all responsibilities to the affected property owners for correction of all damages. The Contractor is expected to review his site grading and drainage operations periodically with the Owner with the view in mind of determining the areas most susceptible to erosion by excessive rainfall and shall take necessary temporary measures in sufficient time to minimize the washing away of the site soils that would likely occur before the areas are finished graded, topsoiled and planted. The temporary measures to be provided by the Contractor at the critical areas may consist of, but not limited to, any one or a combination of the following, or by other approved means selected by the Contractor:

- Silt Fence
- Gravel Construction Entrance/Exit
- Inlet Protection

If any earthwork is to be suspended for any reason whatsoever for longer than 15 days, the disturbed areas shall be seeded with temporary vegetative cover or otherwise protected against excessive erosion during the suspended period. Suspension of work in any area of operation does not relieve the Contractor of the responsibility for the erosion control and temporary measures will not be considered cause for a change in the price bid.

MAINTENANCE

The Contractor shall inspect and maintain each erosion control measure until the project is stabilized and accepted. After each significant rainfall, the Contractor shall remove and dispose of silt accumulation from each individual measure. The following maintenance may be required for each specific erosion and sediment control measure:

Silt Fence: Fabric shall be removed and replaced whenever deteriorated to such an extent the effectiveness is reduced. The toe of the fabric shall be buried a minimum of 6 inches.

Gravel Construction

Entrance/Exit: Periodic top dressing with two inches (2") of graded stone. Remove all objectionable materials spilled, washed or tracked onto public roadways.

Sediment

Trap: Remove sediment and restore trap to original dimensions when accumulated silt volume equals $\frac{1}{2}$ the design depth. Replace the contaminated gravel facing.

Gravel Inlet

Protection: Remove sediment as necessary to provide adequate volume. Replace contaminated gravel facing if required.

Rip-Rap: Make repairs to dislodged stone and/or supplement as required if erosion occurs during heavy rainfalls.

REMOVAL

After the area has been stabilized and the project accepted, the Contractor shall remove all temporary erosion and sediment control measures. Silt fences shall be removed, sediment traps/pits and/or basins filled with suitable soil, compacted and seeded. The materials removed shall remain the property of the Contractor and shall be disposed of off-site, or may be reused in other locations if approved by the Owner.

DIVISION 2 SITE WORK

02730 SANITARY SEWER SYSTEMS

GENERAL

Sanitary sewer lines and all appurtenant items shall be constructed of materials specified or indicated on the drawings. The intent and purpose of these specifications is to require a complete and satisfactory installation in every respect and any defect in material or workmanship shall be cause for the replacement and correction of such defect as directed by the Public Works Commission.

RELATED SECTIONS

- A. 02211 – Grading, Utilities
- B. 02222 – Excavation and Backfilling for Utility Systems
- C. 02732 – Sewage Force Mains

MATERIALS

SEWER MAINS

Prior to shipment each joint of pipe shall be stamped by an independent testing laboratory, certifying compliance with the specifications stated therein. Pipe sizes indicated shall be understood to be nominal inside diameter of the pipe. All sewer pipe materials shall be either PVC (as specified herein) or ductile iron (as specified herein), unless otherwise approved in writing by the Public Works Commission. Written approval shall be obtained prior to installation.

DUCTILE IRON PIPE

All ductile iron pipe and fittings shall be in strict accordance with ANSI A21.51 and AWWA C151, Class 50 or Class 51, as applicable, in every respect. The working pressure shall be a minimum of 200 psi. Pipe shall be furnished in 18 or 20-foot lengths. All pipe joints used in open trench construction shall be furnished with "push-on" joints, unless otherwise indicated on the drawings or specified. All joints and fittings shall be in accordance with ANSI A21.11 and AWWA C111. All ductile iron interior surfaces shall be lined with two (2) coats of ceramic epoxy to produce a total minimum dry film thickness of 40 mils (Protecto401 or approved equal). The exterior pipe surfaces shall be protected with asphaltic coating as specified in AWWA C151 and C110. Specifications for the ceramic epoxy can be found in Specification Section 09802.

For aerial crossings which are 4 inches through 12 inches in diameter, manufactured restrained joint ductile iron pipe Class 53, or Class 53 flanged ductile iron pipe shall be utilized in accordance with the standard Public Works Commission detail for aerial crossings. Mega-lugs, field-lok, and gripper rings are not an allowable means of restraint for aerial crossings. For aerial crossings larger than 12 inches, or as

noted specifically on the plans, flange joint ductile iron pipe, Class 53, shall be utilized in accordance with the standard Public Works Commission details. The location of flanges shall be specifically designed for each application. The flange pipe shall be in accordance with ANSI/AWWA C-115/A21.15. Threads for threaded flange pipe shall be in accordance with ANSI B2.1, shop fabricated as outlined by AWWA 115 with serrated faces furnished on the pipe, completely factory installed. Welding of flanges to the body of the pipe will not be acceptable. Ductile iron fittings and flanges shall be in accordance with ANSI/AWWA C-110/A21.10 with a minimum working pressure of 250 psi. Gaskets shall be full faced SBR rubber per ANSI/AWWA C-111/A21.11 with a minimum 1/8" thickness. Linings and coatings shall be as outlined for ductile iron pipe.

If the Public Works Commission determines that an expansion coupling is required, it shall be installed as indicated on the drawings. The expansion coupling shall not be buried.

For subsurface water crossings (i.e., streams, wetlands), restrained joint ductile iron pipe shall be utilized. No mechanical restraint systems (e.g., mega-lugs, field-lok gaskets, etc.) shall be utilized. The pipe shall be installed in a casing, in accordance with the approved Public Works Commission detail, unless otherwise specifically approved by the Public Works Commission.

PVC PIPE

PVC sewer pipe and fittings 4 inches thru 15 inches shall be in accordance with ASTM D-3034 with a standard dimension ratio (SDR) of 26 for sewer mains and laterals. Larger diameter pipe (18 inches through 27 inches) shall be in accordance with ASTM F-679, with a SDR of 26. Both pipe and fittings shall be made of PVC plastic having a cell classification of 12454 as specified in ASTM D-1784.

Pipe joining shall be push on elastomeric gasket joints only and the joints shall be manufactured and assembled in accordance with ASTM D-3212. Elastomeric seals shall meet the requirements of ASTM F-477. The pipe shall be furnished with integral bells and with gaskets that are permanently installed at the factory and in accordance with ASTM D-3212 and contain a steel reinforcing ring. PVC sewer pipe shall be made by continuous extrusion of prime green unplasticized PVC and contain identification markings as required by the applicable ASTM standard.

SEWER FITTINGS

Ductile Iron Push-on Fittings:

Ductile iron sewer fittings on PVC mains shall be deep bell, gasketed joint, and air test rated. Gasket grooves shall be machined in the factory. Material shall be ductile iron, in accordance with ASTM A536, Grade 65-45-12 and ASTM F1336. Wall thickness shall meet the requirements of AWWA C153. Gaskets shall have a minimum cross sectional area of 0.20 square inches, and conform to ASTM F477. All ductile iron fittings shall have an interior coating of Protecto 401, or approved equal. All ductile iron fittings on PVC pipe shall provide a flow line that provides a smooth transition between the materials. Ductile iron fittings shall be as manufactured by the Harrington Corporation (Harco), or approved equal.

Mechanical Joint Fittings:

Joints shall be installed in accordance with AWWA C-600 and shall conform to AWWA Standard C-111. Mechanical joints shall be of the stuffing box type and shall conform to ANSI A21.11 for four inch (4") pipe and larger. Fittings and specials shall be ductile iron and shall be manufactured in accordance with AWWA Standard C-110 (ANSI A21.11). Compact fittings shall be ductile iron in accordance with ANSI A 21.53 (AWWA C-153) for 4" thru 24" sizes only. Note: mechanical joint wyes are not included in the AWWA C-153 specification. Pressure rating shall be not less than 200 psi unless otherwise specified. All ductile iron fittings shall have an interior coating of Protecto 401, or approved equal. Mechanical joint fittings shall be utilized on ductile iron mains and ductile iron laterals. Mechanical joint fittings shall not be utilized on PVC mains, unless otherwise approved by the Public Works Commission.

PVC Fittings:

PVC fittings shall be manufactured in accordance with ASTM D-3034, F-1336, and F-679. Molded fittings shall be utilized in sizes from 4" to 8" (or larger, if available). Fabricated fittings shall only be utilized with prior approval from the Public Works Commission. Fabricated fittings are defined as those fittings that are made from pipe or a combination of pipe and molded components. All PVC fittings shall contain identification markings as required by the applicable ASTM standard. All PVC fittings shall be gasketed joint, except as indicated for interior drop structures. Plastic fittings shall be as manufactured by GPK Products, Inc., Plasti-Trends, the Harrington Corporation (Harco), or approved equal.

Ductile Iron Pipe Size x SDR26 Transition Adapter:

All ductile iron x PVC transition adapters shall be one (1) piece, bell x bell (gasket x gasket). Transition adapters shall range in size from four (4) inches through 12 inches. Transition adapters for pipe larger than 12-inches shall be as specified by the Public Works Commission. All transition adapters shall have a flow way tapered to allow a smooth transition between the ductile iron and PVC. Transition adapters shall be either PVC or ductile iron, in accordance with the following:

PVC – All PVC transition fittings shall be made from DR 18 C900 pipe stock. The C900 pipe stock shall meet the requirements of AWWA C900/C905, and have a minimum cell classification of 12454 as defined in ASTM D1784. The wall thickness shall meet or exceed DR 18. PVC transition fittings shall have SBR gaskets in accordance with ASTM F477. All six (6) inch and eight (8) inch adapters shall be molded. Molded fitting joints shall be 235 psi rated, in accordance with ASTM D3139, and shall have SBR rubber gaskets. Four (4) inch, ten (10) inch and 12 inch transition adapters shall have SBR Rieber style gaskets meeting ASTM F477. Joints shall be 235 psi rated, in accordance with ASTM D3139 for the C900 (ductile iron) bell, and in accordance with ASTM D3212 for the sewer (SRD26) bell. Molded C900 bell depths shall comply with AWWA C907. Fabricated (4-inch, 10-inch and 12-inch) bell depths and molded sewer (SDR26) bell depths shall be in accordance with ASTM F1336. PVC transition adapters shall be manufactured by the Harrington Corporation (Harco), GPK Products, or approved equal.

Ductile iron – Ductile iron transition fittings shall be deep bell, push-on joint, and air test rated. The ductile iron material shall comply with ASTM A536, Grade 65-45-12 or 80-55-06. The bell depth shall be in accordance with ASTM F1336. Gaskets shall be of SBR rubber, in accordance with ASTM F477. Transition gaskets are not allowed. All ductile iron transition fittings shall have an interior coating of

Protecto401 or approved equal. Ductile iron transition fittings shall be manufactured by the Harrington Corporation (Harco) or approved equal.

Saddles:

Sewer service saddles may be utilized for sewer lateral installations. All sewer service saddles shall be ductile iron with stainless steel straps, bolts, nuts, and washers. The nuts shall be coated to prevent galling. The saddle body shall be ductile iron, in accordance with ASTM A536, Grade 65-45-12. The gasket material shall be SBR, in accordance with ASTM D2000. Saddles for PVC or DI laterals shall have an alignment flange. Sewer service saddles shall be as manufactured by Geneco, or approved equal. All stainless steel straps shall be pre-formed at the factory, to the specified outside diameters of the pipe.

SEWER LATERALS

Ductile iron laterals – For ductile iron mains, utilize mechanical joint fittings or an approved saddle with an alignment flange (Geneco or approved equal). For PVC mains, utilize an approved saddle with an alignment flange (Geneco or approved equal) or ductile iron fittings as specified above.

PVC laterals – utilize a saddle with an alignment flange (Geneco or approved equal) on PVC or ductile iron mains; utilize a mechanical joint tee with SDR 35 transition gaskets on ductile iron mains; or utilize PVC fittings as specified above on PVC mains.

The following table summarizes the materials to be utilized for sewer main to lateral connections:

	PVC Main	DI Main
DI Lateral	DI fitting or approved saddle	MJ fitting or approved saddle
PVC Lateral	PVC fitting or approved saddle	MJ fitting with transition gasket or approved saddle

Sewer laterals shall be in accordance with these Specifications and PWC standard details S.10, S.11, and S.12.

PRECAST CONCRETE MANHOLES

Pre-cast circular reinforced concrete manhole units shall be in accordance with ASTM C-478. The tongue and groove ends of the manhole sections shall be manufactured for jointing with rubber gaskets (i.e., con-seal). An eccentric cone shall be utilized on all manholes, unless otherwise approved by the Public Works Commission.

Manhole steps shall be placed in all manholes and shall be steel reinforced (½" grade 60) copolymer polypropylene plastic steps in accordance with ASTM C-478 for material and design. The steps shall be spaced 16" on center with serrated treads and wide enough to stand on with both feet.

Manhole frames and covers shall be made of gray cast-iron, and the iron shall possess a tensile strength of not less than 18,000 psi. Cast iron shall conform to ASTM Specification A 48-83 Class 35. The frame

and cover shall be manufactured by the same manufacturer. All castings shall be in accordance with Public Works Commission standard details. Any defective castings shall be removed and replaced.

Any special linings and coatings that are specified for a manhole and installed at the production facility, in the field, or during repairs, shall be applied in accordance with the applicable special coatings specification and the manufacturer's specifications for that material.

Camlock ring and covers shall be in accordance with Public Works Commission standard details. Camlock bolt head shall be compatible with PWC standard tool for turning camlock mechanism. Camlock ring and covers shall be installed as indicated on the drawings, in accordance with PWC standard details.

SELECT BEDDING MATERIAL

Select bedding material shall be crushed stone (No. 57 or No. 5), in accordance with Public Works Commission standard details. Bedding material shall be provided for all pipe materials.

INSTALLATION

Pipe installation shall be in strict accordance with Specification Section 02222 – Excavation and Backfilling for Utility Systems and as outlined herein.

PIPE LAYING

Pipe installation shall be in accordance with the manufacturer's instructions. Proper equipment shall be utilized to perform the work in a manner satisfactory to PWC. All pipes and fittings shall be carefully lowered into the trench in such a manner to prevent damage to the protective coatings and linings. Under no circumstances shall pipe materials be dropped or dumped into the trench. Pipe shall be carried into position and not dragged.

All dust, dirt, oil, tar (other than standard coating), or other foreign matter shall be cleaned from the jointing surfaces, and the gasket, bell, and spigot shall be lubricated with lubricant recommended by the manufacturer.

The pipe shall be laid upgrade, beginning at the lower end with the tongue or spigot ends pointing in the direction of the flow to the correct line and grade, unless otherwise approved by PWC. The pipe section to be installed shall be aligned by batter board or laser beam with the last installed pipe section. Mechanical equipment should not be used to assemble the pipe. Pipe shall be assembled in accordance with the pipe manufacturer's instructions. Any damage resulting from the use of mechanical equipment shall be replaced as directed by PWC.

Adjustments in grade by exerting force on the barrel of the pipe with excavating equipment shall not be allowed. The Contractor shall verify line and grade after assembling each joint.

At any time when pipe laying is not in progress, the open ends of the pipe shall be closed by a water tight plug or other means approved by the PWC Project Coordinator. If water is in the trench, the plug shall remain in place until the trench is pumped completely dry. No pipe shall be laid in water or where in the PWC Project Engineer's and/or PWC Project Coordinator's opinion trench conditions are unsuitable. Every precaution shall be taken to prevent material from entering the pipe while it is being installed.

ALIGNMENT AND GRADE

All pipe shall be installed to the required lines and grades. Structures shall be installed at the required locations. The lines and grades of the pipe will generally be indicated by stakes parallel to the line of the pipe. The Contractor shall be responsible for installing the pipe to proper line and grade.

Pipe shall be visually inspected by shining a light between structures and /or by closed circuit television inspection. Any defects discovered, including poor alignment, shall be corrected as directed by the Public Works Commission.

The bottom of the trench shall be excavated to a minimum of four inches (4") below the outside bottom of the pipe being installed to allow adequate placement and compaction of bedding material prior to installation.

Select bedding material shall be placed a minimum of four inches (4") and a maximum of six inches (6") under the pipe for full width of the trench and halfway up the pipe on the sides. Bedding material shall be placed in layers not exceeding six inches (6") loose thickness for compacting by vibratory mechanical tamps under the haunches and concurrently on each side of the pipe for the full width of the trench. The final result shall be "Class B" bedding for rigid pipe. If the existing material under the pipe bedding material is unsuitable, the unsuitable material shall be removed and replaced with select bedding material (No. 57 or No. 5 stone), as authorized and approved by the Public Works Commission Project Coordinator.

The same material pipe shall be utilized from manhole to manhole, unless otherwise approved by PWC. If the section of pipe between manholes is 250 feet or less, no transitions will be allowed (either all PVC or all ductile iron). Should the length between manholes exceed 250 feet, only one transition will be allowed. Use of a C900 x SDR 26 adaptor shall be used to accomplish the transition. A transition is defined as the use of one C900 x SDR26 adaptor. No more than one (1) adaptor shall be utilized in any given manhole to manhole segment.

All manholes shall be constructed to Public Works Commission's standards. Installation shall be in accordance with ASTM C-891 and PWC standards.

Manholes shall be constructed of precast reinforced concrete circular sections installed on a base riser section with integral floor and shall be cored to accommodate the various pipe connections, as indicated on the drawings. Pipe connections to a manhole shall be by gasketed flexible watertight connections (boot for small diameter and A Loc for larger diameter pipe) or as approved by the Public Works Commission. The manhole size shall be in accordance with the following table, unless otherwise specified:

<u>Pipe Size</u>	<u>Manhole Diameter</u> **
24" and less	48" *
27" - 36"	60"
42"	72"

* Where interior drop structures are required, use 60" diameter as required in the Public Works Commission standard details.

** Where multiple connections or acute angles are required, larger diameter manhole may be required as indicated on the plans.

The invert channel shall be constructed of brick and mortar, in accordance with Public Works Commission standard details. **Precast inverts are not allowed.** The invert channel shall be smooth and semicircular in shape conforming to the inside of the connecting sewer section. Changes in direction of flow shall be made with a smooth curve as large as a radius as the size of the manhole will permit without a decrease in flow velocity. Changes in size and grade of the channel shall be made gradually and evenly. The invert channel walls shall be constructed to three quarters (3/4) of the height of the crown of the outlet sewer and in such a manner not to obstruct maintenance, inspection or flow in the sewers. The inverts shall have a minimum slope of one (1) percent across the bottom of the manhole. A shelf shall be provided on each side of any manhole invert channel. Inverts in manholes with standing water will not be acceptable. The shelf shall be sloped not less than 1:12 (min) and no more than 2:12 (max). The bottom of the boot for the new sewer main or lateral shall be set one inch above existing shelf unless otherwise indicated.

When used in a paved street, the ring and cover shall be set in suitable mortar surrounded by a concrete collar in accordance with Public Works Commission standard details. When used in places other than in a paved street, the ring and cover shall be set to the grade shown on the plans or directed by the Public Works Commission. In unpaved areas cam-lock ring and cover shall be used. Camlock ring and cover shall be installed in accordance with Public Works Commission standard details.

The interior manhole riser joints, lift holes and grade adjustment rings shall be sealed with non-shrinking mortar to provide a watertight manhole. Lift holes sealed by the manufacturer with plastic caps do not require mortar seal. The hardened mortar shall be smooth to rub with no sharp edges. Use of grade rings with cam-lock ring and cover are not allowed, unless approved by the PWC Project Coordinator. **Use of grade rings is not allowed for above grade adjustments.**

All exterior manhole riser joints, including the joint at the cone, shall be sealed with an external rubber sleeve. The sleeve shall be made of stretchable, self-shrinking rubber, with a minimum thickness of 30 mils. The back side of each wrap shall be coated with a cross-linked reinforced butyl adhesive. The butyl adhesive shall be a non-hardening sealant, with a minimum thickness of 30 mils. The seal shall be designed to stretch around the manhole joint and then overlap to create a fused bond between the rubber and butyl adhesive. The application shall form a continuous rubber seal for the life of the application. The sealing system shall be as manufactured by Concrete Sealants, Inc. (Con-Seal), Sealing Systems, Inc., or approved equal. The wrap shall be a minimum of six (6) inches in width, and shall be centered on the

joint. All manhole joints (including the cone section to the last riser) shall be wrapped and sealed. Care shall be taken to prevent damage to the wrap during backfill operations. The manhole surface shall be prepared in accordance with manufacturer's specifications, prior to installing the joint wrap.

Materials shall not enter the sewer line during construction of the manhole. The manhole shall be kept clean of any and all debris or materials. Any debris or material that entered the manhole shall be immediately removed. This condition shall be maintained until final acceptance of the work.

CONNECTION TO EXISTING MANHOLES OR LIFT STATIONS

All connections to existing manholes and/or lift stations shall be approved by the Public Works Commission. Where new mains are to be connected to existing active sanitary sewers, the active sewers shall remain in service. Unless otherwise indicated, where new lines are connected into existing manholes, all or such portion of the manhole invert as is necessary shall be removed and a new invert shall be constructed to accommodate both new and existing flows. All work shall conform to the requirements specified for new manholes. The existing structure connection shall be cored and a flexible watertight connection (i.e., boot) installed. The boot shall be installed in accordance with Public Works Commission standard details and requirements. The Contractor shall coordinate and cooperate with the Public Works Commission's Project Coordinator.

PIPE TO MANHOLE CONNECTOR (BOOT)

A watertight, flexible pipe-to-manhole connector shall be utilized on all pipe to manhole connections, for both new and existing manholes and pipes, unless otherwise specifically authorized in writing by the Public Works Commission.

The connector assembly shall be the sole element to provide a watertight seal of the pipe to the manhole or other structure. The connector shall consist of a rubber gasket, an internal compression sleeve, and one or more external take-up clamps. The connector shall consist of natural or synthetic rubber and Series 300 non-magnetic stainless steel. No plastic components shall be allowed.

The rubber gasket shall be constructed of synthetic or natural rubber, and shall meet or exceed the requirements of ASTM C-923. The connector shall have a minimum tensile strength of 1,600 psi. The minimum cross-sectional thickness shall be 0.275 inches.

The internal expansion sleeve shall be comprised of Series 300 non-magnetic stainless steel. No welds shall be utilized in its construction.

Installation of the connector shall be performed utilizing a calibrated installation tool furnished by the connector manufacturer. Installation shall require no re-tightening after the initial installation. Installation shall be done in accordance with the manufacturer's instructions.

The external compression take-up clamps shall be Series 300 non-magnetic stainless steel. No welds shall be utilized in its construction. The clamps shall be installed utilizing a torque-setting wrench

furnished by the connector manufacturer. Installation shall be done in accordance with the manufacturer's instructions.

The Contractor shall utilize the proper size connector in accordance with the connector manufacturer's recommendations. All dead-end pipe stubs shall be restrained in accordance with ASTM C-923.

The finished connection shall provide a sealing to a minimum of 13 psi, and shall accommodate a minimum pipe deflection of seven (7) degrees without the loss of seal.

The pipe to manhole connector shall be PSX: Direct Drive as manufactured by Press-Seal, or approved equal.

INSIDE DROP MANHOLE STRUCTURE

Inside manhole drop structures shall be constructed and installed in accordance with Public Works Commission standard details.

CLEANING

Prior to final inspection, all sanitary sewer laterals, mains, and manholes newly installed on the collection system shall be flushed and cleaned. During the flushing operation, the downstream manhole shall be closed with a watertight plug to protect the existing sewer main. All water and debris shall be removed and properly disposed of by the Contractor. This condition shall be maintained until the Public Works Commission issues final acceptance for the project.

TESTING

Completed sewers shall be tested in accordance with the provisions outlined below. The Contractor shall furnish all equipment, labor, materials, and pay all costs associated with the tests performed. The Contractor shall schedule all testing with the Public Works Commission's Project Coordinator, a minimum of 48 hours in advance. The Contractor shall cooperate with the Public Works Commission's Project Coordinator and furnish any needed assistance necessary to complete the required testing.

For annexation and/or retrofit projects: No testing shall be conducted prior to successful completion of the compaction testing.

For all other projects: No testing shall be completed until all utilities are installed, prior to preparation of the road subgrade. The Contractor may elect to perform testing to satisfy them that the sewer utility is installed properly prior to commencing installation of other utilities. However, such testing shall not be construed as acceptance by PWC.

The deflection/mandrel test shall not be performed until a minimum of thirty (30) calendar days after backfill operations are completed and the area graded to final contours. In lieu of waiting thirty (30) calendar days, the Contractor has the option to have an independent testing laboratory verify that

compaction has been completed to achieve the maximum density as shown in the detail. The location and elevation of the compaction testing shall be determined reviewed and approved by the Public Works Commission’s Project Coordinator. The Contractor shall provide the Public Works Commission with a copy of the density testing results.

Compaction testing shall be done in accordance with Specification Section 02222 – Excavation and Backfilling for Utility Systems.

Vacuum Testing Manholes:

All precast sanitary sewer manholes installed by the Contractor shall be vacuum tested for leakage. This test shall be done in accordance with ASTM C-1244 and in the presence of a Public Works Commission Project Coordinator. The Contractor shall be responsible for providing all the necessary labor, materials, equipment, testing apparatus, and all other incidentals necessary to complete the vacuum test. All testing equipment utilized shall be approved for use in vacuum testing manholes.

Each manhole shall be tested after assembly. All lift holes shall be plugged with an approved non-shrink grout. All lines, including laterals, entering the manhole shall be temporarily plugged. The Contractor should take care to ensure that the pipes and plugs are secure in place to prevent them being drawn into the manhole. The test head shall be placed directly on top of the concrete surface of the manhole following the manufacturer’s recommendations, rather than to the cast iron seating ring.

Manholes may be tested either prior to backfill or post backfill at the contractor’s option. For pre-backfill testing, a vacuum of 10 inches of Mercury (inches Hg) shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 inches of Mercury (inches Hg). The manhole is acceptable if the time for the vacuum reading to drop from 10 inches of Mercury to 9 inches of Mercury meets or exceeds the values indicated below:

<u>Manhole Depth</u>	<u>Diameter of Manhole</u>		
	<u>4’ Diameter</u>	<u>5’ Diameter</u>	<u>6’ Diameter</u>
10’ or less	25 sec	33 sec	41 sec
11’ to 15’	38 sec	49 sec	62 sec
16’ to 20’	50 sec	65 sec	81 sec
21’ to 25’	62 sec	82 sec	101 sec
25’ to 30’	74 sec	98 sec	121 sec

Vacuum testing backfilled manholes is not recommended in the presence of groundwater. Vacuum testing a backfilled manhole that is subjected to hydrostatic pressure may exceed the design limits of the flexible connectors and could lead to failure of the structure, joints, and/or connectors. Where groundwater is present a reduction in the vacuum pressure applied to the manhole will be required. The

vacuum shall be reduced by 1 inch of Mercury for every 1 foot of hydrostatic head between 12 feet and 21 feet. A vacuum test should not be performed when the hydrostatic head exceeds 22 feet. See the chart below:

Hydrostatic Head (ft)*	12	13	14	15	16	17	18	19	20	21	22
Vacuum Pressure (in Hg)	10	9	8	7	6	5	4	3	2	1	**

*Hydrostatic head above the critical connector (critical connector is bottom most flexible connector)

**Do not perform vacuum test

If the manhole fails the initial test, the manhole shall be repaired by an approved method until a satisfactory test is obtained. All repair methods shall be approved by the Public Works Commission prior to being utilized. Retesting shall be performed until a satisfactory test is accomplished.

Mandrel Testing:

Deflection tests shall be performed on all PVC pipe installations. PVC pipe's maximum deflection after backfilling shall not exceed five (5) percent. The rigid ball or mandrel used for the deflection test shall have a diameter not less than 95 percent of the base inside diameter or average inside diameter of the pipe depending on the type of pipe manufactured and the applicable ASTM Standard. The PVC pipe shall be measured in compliance with ASTM D2122 “Standard Test Method of Determining Dimensions of Thermoplastic Pipe and Fittings”. The Contractor shall supply all labor, equipment and materials necessary to perform the test in the presence of the Public Works Commission’s Project Coordinator. The test shall be performed without mechanical pulling devices. The mandrel shall be constructed so as to preclude any yield in diameter, and with a pull line on each end to facilitate withdrawal. If the deflection exceeds the allowable, the Contractor shall remove and replace the pipe.

Air Testing:

Air testing shall be performed on all mains and laterals to determine acceptability. The length of sewer subject to an air test shall be the distance between two adjacent manholes. The tests shall be conducted in accordance with the appropriate ASTM standard. The air test shall be coordinated with the Public Works Commission. The Contractor is required to supply all equipment, labor, materials and pay all costs associated with the test performed.

Air Test for PVC Pipe

The low pressure air test on PVC pipe shall be performed with satisfactory results in accordance with ASTM F1417 “Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air”. The pipe, including lateral assemblies, shall be plugged and air added slowly until the internal pressure of the line is raised to 4.0 psi. After the pressure of 4.0 psi is obtained, regulate the air-supply so that the pressure is maintained between 3.5 and 4.0 psi for at least two (2) minutes, depending on air/ground temperature conditions. The pressure will drop slightly until equilibrium is obtained; however, a minimum of 3.5 psi is required. Once the 3.5 psi is maintained, the test will begin. If the pressure drops 1.0 psi within the time indicated below, the test fails.

Pipe Dia (in)	Minimum time (minutes)	Length for Min Time (ft)	Time for Longer Length (sec)
4	3:46	597	0.380L
6	5:40	398	0.854L
8	7:34	298	1.520L
10	9:26	239	2.374L
12	11:20	199	3.418L
15	14:10	159	5.342L
18	17:00	133	7.692L
21	19:50	114	10.470L
24	22:40	99	13.674L
27	25:30	88	17.306L
30	28:20	80	21.366L
33	31:10	72	25.852L
36	34:00	66	30.768L

The Contractor shall observe all safety precautions to include allowing no one in the manholes during testing, securing all plugs and providing additional plug bracing. The Contractor shall be required to furnish, install and remove after testing at no additional cost, a temporary glue cap/plug to be airtight for all cleanout stacks to accomplish air testing. The air pressure shall never exceed 8 psi. All gauges shall be accessible outside of the manholes.

HYDROSTATIC TESTS

After the ductile iron sewer pipe has been laid within the "protected" area and backfilled to finished grade, the pipe shall be subjected to a hydrostatic pressure test. All laterals within the "protected" area shall be ductile iron. All sewers subject to hydrostatic testing shall include (1) sewers entering or crossing streams, (2) sewers located less than 100 feet from any public or private water supply source including any WS-I waters or Class I or Class II impounded reservoirs, (3) where the minimum 18 inch vertical and 10 feet horizontal separation cannot be maintained between sewers and water mains (see NC DENR Regulations), or (4) as specified and/or indicated on the drawings. The Contractor will furnish all labor and material, including test pumps, plugs, and all other incidentals for making hydrostatic tests. Hydrostatic pressure testing shall be conducted on the completed main, including the laterals.

The duration of the pressure test shall be at least one hour or longer, as directed by the Public Works Commission. The hydrostatic pressure shall be 150 psi. Each section of pipe shall be slowly filled with water and the specified test pressure based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Public Works Commission. Before applying the specified test pressure, all air shall be expelled from the pipe.

All joints showing visible leaks shall be made tight. Cracked or defective pipe, joints, laterals, and fittings discovered in consequence of the pressure test shall be removed and replaced with sound material, and the test shall be repeated until the test results are satisfactory. The requirement for the joints to

remain exposed for the hydrostatic test may be waived by the Public Works Commission in certain situations. The test shall be repeated until satisfactory to the Public Works Commission.

The results of the pressure tests shall be satisfactory as specified. All replacement, repair, or retesting shall be accomplished by the Contractor. All repairs shall be reviewed and approved by the Public Works Commission prior to backfill. The use of couplings, sleeves, etc. shall be reviewed and approved by the Public Works Commission prior to use.

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**DIVISION 2
SITE WORK****02750 WASTEWATER FLOW CONTROL****GENERAL**

The intent and purpose of these specifications is to provide wastewater flow control, i.e., bypass pumping, of the sanitary sewer flows during the Contractor's operations. The Contractor shall furnish all labor, materials, accessories, equipment and tools for performing all operations required to bypass pump sewage around a manhole or sewer section in which work is to be performed.

The Contractor shall provide all pumps, piping, and other equipment to accomplish this task; perform all construction; obtain all permits; pay all costs; and perform complete restoration of all existing facilities to equal or better condition to the satisfaction of the Fayetteville Public Works Commission. The Contractor shall be responsible for the design, installation, operation, and maintenance of the temporary bypass pumping system. The Contractor shall provide sufficient documentation to the Fayetteville Public Works Commission to demonstrate that he, or his designated subcontractor, have the experience in the design, installation, and maintenance of temporary bypass pumping systems.

RELATED SECTIONS

- A. Section 02305 – Pipe Bursting
- B. Section 02500 – Traffic Control
- C. Section 02730 – Sanitary Sewer System
- D. Section 02760 – Television Inspection
- E. Section 02766 – Sewer Line Cleaning
- F. Section 02780 – Cured-in-Place Lining

REQUIREMENTS

The Contractor shall be responsible for all aspects of the bypass operation, including but not limited to: providing access to install, move, and maintain the pumps in the proper position, traffic control, installation and removal of bypass equipment, pump monitoring, testing of the bypass system, re-fueling, maintenance, notification of property owners (should access to private property be necessary), wastewater and fuel spill containment, and removal and replacement of manhole cones (if necessary). The bypass system (pumps and piping) shall be monitored by Contractor personnel at all times, when the bypass operation is in effect.

The Contractor shall have all materials and equipment on site to immediately respond to any emergencies or other event that could impact the bypass system (i.e., leak in the discharge piping, pump failure, flooding, etc.). The Contractor shall have sufficient staff and equipment to mobilize to repair and/or service any equipment within one (1) hour of notification, 24 hours a day, seven (7) days a week. In the event of an emergency, the Contractor shall provide an immediate response and fully cooperate with the Fayetteville Public Works Commission.

The Contractor shall install the bypass pumps, equipment, and discharge lines to minimize impacts to the property owners, residents, and environment. The Contractor shall be responsible for determining the best location for the bypass equipment, and the need for any special provisions to ensure access for the customers. Such special provisions include, but are not limited to: installation of ramps, excavation and burial of the bypass lines, temporary fencing, etc. The Contractor bears all responsibility for the maintenance and restoration of any trenches, ramps, access, etc. necessary for the temporary bypass pumping operation.

The Contractor shall take appropriate steps to ensure that all pumps, piping and hoses that carry raw sewage are protected from traffic. The Contractor shall identify the proposed methods to protect the temporary bypass pumping system from traffic as part of the detailed temporary bypass pumping plan. Traffic control shall be performed in accordance with these Contract Documents.

The bypass pumping system shall be monitored by Contractor personnel at all times, when the bypass operation is in effect. The bypass pumping equipment shall be automated and capable of functioning without the assistance of an operator.

SUBMITTALS

All submittals shall be provided in accordance with these Contract Documents, and the requirements outlined herein. The Contractor shall submit a detailed bypass pumping plan to the Fayetteville Public Works Commission for approval, prior to initiating the bypass operation. The Contractor shall submit this information far enough in advance to allow sufficient time to complete the necessary coordination, including but not limited to obtaining permits (i.e., encroachments), getting permission from property owners to cross and/or utilize their property, and gaining any necessary regulatory approvals. Failure to submit a complete and comprehensive bypass pumping plan in a timely manner shall not be cause for any extension of the Contract Time.

The detailed temporary bypass pumping plan shall include the following information:

- Method of monitoring the pumps to ensure proper operation, to include method of notifying personnel (Fayetteville Public Works Commission and Contractor) in the event of an emergency, activation of back-up pumps, etc.
- Method of monitoring upstream system levels to ensure surcharging does not result in back-ups into buildings, overflows, etc.
- The amount, if any, of any required surcharging.
- Method to initiate back-up pumps.
- Map showing general location of the pumps and bypass lines. This shall include means to maintain access to driveways, etc.
- Measures to secure the bypass system (lines, pumps, etc.) from traffic, vandalism, high stream flows, etc.
- Method of plugging (and securing the plug(s)) and type of plugs.
- Size and location of manholes or other access points for suction and discharge piping.
- Size of pipeline(s) or conveyance system(s) to be bypassed.
- Number, size, material, location, and method of installation of suction piping.
- Number, size, material, location, and method of installation of discharge piping.
- Bypass pump sizes, capacities, and number of each size to be provided on-site, including all primary, secondary, and spare pumping units.

- Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted). Calculations shall be signed and sealed by a licensed Professional Engineer registered in the State of North Carolina.
- Measures to protect discharge manhole(s) or structure(s) from erosion and damage due to the bypass operation.
- Erosion control measures.
- Emergency contact information for the personnel responsible for the pump operation.
- Emergency contact information for Contractor personnel to respond in the event of an emergency.
- List of available resources (equipment, materials, personnel) and contact information for emergency response.
- Method to contain potential releases of sewer flow from air release valves.
- Contingency plan for responding to potential sewer spills caused by weather, vandalism, acts of God, etc. The plan shall include communication protocols, available resources, and the steps to be taken in the event of an emergency.

No bypass operations shall proceed until all bypass submittals have been reviewed and approved by the Fayetteville Public Works Commission.

COORDINATION

The Contractor shall fully coordinate their temporary bypass pumping operations with the Fayetteville Public Works Commission. It is the Contractor's responsibility to fully determine the scope and location of the temporary bypass pumping system. As outlined in these Contract Documents, the Fayetteville Public Works Commission may provide assistance with the building and maintenance of access roads, clearing of easements, etc. All coordination (to include location of the pumps and discharge lines) shall be fully discussed and agreed to prior to commencement of bypass operations.

The Contractor shall schedule a coordination meeting with the Fayetteville Public Works Commission and other personnel (Contractor, bypass sub-contractor, etc.) a minimum of three (3) business days prior to starting the temporary bypass pumping system. The purpose of this coordination meeting is to ensure that the Contractor and their sub-contractors have a good understanding of the requirements and expectations of operating the temporary bypass pumping system, discuss contingency plans (to include protocols for emergency contacts), identify location(s) of pumps, verify necessary materials (repair sleeves, containment devices, etc.) are on-site and available, and any other items necessary to ensure that the Fayetteville Public Works Commission has confidence that the appropriate personnel can operate and maintain the temporary bypass pumping system. Should, for any reason, the Fayetteville Public Works Commission deem that the Contractor and/or their sub-contractor is not prepared to operate and maintain the temporary bypass pumping system, the temporary bypass pumping system shall not be started. The Contractor shall take all necessary steps to address any concerns to the satisfaction of the Fayetteville Public Works Commission. Upon completion of those actions, another coordination meeting shall be held, in order for the Fayetteville Public Works Commission to confirm that the Contractor and their sub-contractor is prepared to operate and maintain the temporary bypass pumping system. This process will be repeated until the Fayetteville Public Works Commission is satisfied that the Contractor and their sub-contractor are prepared to operate and maintain the temporary bypass pumping system. No additional contract time will be granted for this delay.

The temporary bypass pumping system shall run for a minimum of 24 hours, or longer as deemed by the Fayetteville Public Works Commission, prior to any activity occurring (cleaning, closed circuit television {CCTV}, etc.) within the main(s) being bypassed.

FLOW CONTROL PRECAUTIONS

Where the raw sewage flow will be blocked during the Work as a result of the temporary bypass pumping operation, the Contractor shall take all necessary precautions to protect the public health. No septic conditions shall be allowed due to Contractor's operations. The sewer system (mains, manholes, laterals, etc.) shall also be protected from damage. The following occurrences shall not be allowed:

1. No sewage shall be allowed to back up into any homes or buildings.
2. No sewage shall overflow any manholes, cleanouts or any other access to the sewers.
3. Users upstream of the project area shall be able to use all their water and sewer utilities without interruption or limitations.

If any of the above occur or are expected to occur, the Contractor shall take immediate action to alleviate one or all of the conditions. Additionally, the Contractor is required to observe the conditions upstream of the plug and be prepared to immediately increase bypass pumping or release the flows, as required. Any damage claims resulting from the Contractor's failure to properly maintain sewer flows shall be the Contractor's responsibility.

All sump pumps, bypass pumps, trash pumps or any other type pump which pulls sewage or any type of material out of the sanitary sewer system shall discharge into another sanitary sewer manhole, or appropriate vehicle or container acceptable to the Fayetteville Public Works Commission. Under no circumstances shall untreated sanitary sewer be discharged, stored or deposited on the ground, swale, road or open environment. The Contractor shall not allow any flow of sewage onto private property, streets, or into creeks and drainage systems. Damage due to negligence of the Contractor, including, but not limited to, flooded dwellings, damaged property, damaged driveways, etc., shall be corrected immediately by the Contractor at no additional cost to the Fayetteville Public Works Commission.

PLUGGING AND BLOCKING

In some applications, the wastewater flow may be plugged and contained within the capacity of the collection system. This shall only be done when it has been determined the system can accommodate the surcharging without any adverse impact. The Contractor has the sole responsibility for determining whether the system can accommodate surcharging. If this option is selected, the Contractor shall be responsible for continuously monitoring the system to ensure no sewer spills or overflows occur.

A sewer line plug shall be inserted into the line at a manhole upstream from the section being surveyed or repaired. The plug shall be so designed that all or any portion of the operation flows can be released. The Contractor shall secure the plug, to prevent it from being dislodged and moving downstream. Flows shall be bypassed for the initial CCTV inspection and shall be bypassed throughout the duration of the work, to include the final CCTV inspection. Flows shall be bypassed in accordance with the approved temporary bypass pumping plan. Upon acceptance of the work by the Fayetteville Public Works Commission, the temporary bypass pumping system shall be removed and flows restored.

PUMPING AND BYPASSING

The Contractor, when and where required, shall divert sewer flows for the sewer pipe rehabilitation process, cleaning, television inspection, pipe repairs, manhole replacement and/or rehabilitation, obstruction removals, or other related as required to complete the Work. The pumps and bypass lines shall be of adequate capacity and size to handle and prevent backup or overflow for all flows. The temporary bypass pumping system shall be designed to maintain the flows necessary to meet the requirements of each particular site. The Contractor shall be responsible for furnishing the necessary labor and supervision to set up, operate, and maintain the temporary bypass pumping system. A “set up” consists of the necessary pumps, conduits and other equipment to divert the flow of sewage, from the start to finish of work performed. The temporary bypass pumping system shall include:

- A minimum of one (1) redundant pump so that the temporary bypass pumping system is capable of transmitting the peak flow with the largest duty pump out of service.
- Pumps shall be provided with a means of automatic control via floats or level sensing. Systems requiring manual starting and/or stopping shall not be allowed.
- All equipment (primary and secondary pumps) shall be equipped in a manner to keep noise to a maximum of 65 dBA at 30 feet.
- An automatic dialer (or similar) to immediately notify Contractor and Fayetteville Public Works Commission personnel in the event of equipment failure. The automatic dialer shall be set to issue notifications prior to flow level reaching critical elevations and having a spill occur.

The temporary bypass pumping system shall be provided in such a way as to maintain access for businesses and residences. The Contractor shall be responsible for determining the best location for the bypass equipment, and the need for any special provisions to ensure access for the residents and businesses. Such special provisions include, but are not limited to: installation of ramps, excavation and burial of the bypass lines, etc. The Contractor shall use bridges over the bypass lines, temporary lines under driveways, alternate routes, or other means to accomplish this item. The bypass plan submittal shall indicate the means of maintaining access. The Contractor bears all responsibility for the maintenance of any trenches, ramps, etc. necessary for the bypass operation.

Pumps, equipment, and bypass lines shall be continuously monitored by Contractor personnel capable of starting, stopping, refueling and maintaining these pumps during the Work. The temporary bypass pumping system shall be provided with an automatic dialer (or other similar device) that will immediately notify the Contractor and the Fayetteville Public Works Commission in the event of equipment failure. This automatic dialer (or similar) shall be set to issue notifications prior to flow levels reaching critical elevations and having a spill occur.

In some applications, it may be necessary to surcharge the system in order to ensure proper pump operation. This shall only be done when it has been determined the system can accommodate the surcharging without any adverse impact. The Contractor has the sole responsibility for determining whether the system can accommodate surcharging. In the event surcharging is necessary, the Contractor shall be responsible for continuously monitoring the system to ensure no sewer spills occur.

All bypass piping shall successfully pass a hydrostatic test prior to bypassing the sewer flows. The hydrostatic test pressure shall be no less than the expected discharge pressures, and shall be held for a minimum of one (1) hour. All testing shall be observed by the Fayetteville Public Works Commission. Testing shall be coordinated with the Fayetteville Public Works Commission a minimum of 24 hours in advance.

SPILL RESPONSE

The Contractor shall not discharge or pump any sewage, solids, or debris on the ground, streets, storm water system, ditches, or streams. Any sewage spills shall be immediately reported to the Fayetteville Public Works Commission Water Resources Construction Department, (910) 223-4716. After normal business hours, the Contractor shall contact the Fayetteville Public Works Commission Dispatch Center, (910) 678-7400 or (910) 323-0178. The Contractor shall take complete responsibility for all costs related to the clean-up of the spill, including any fines issued by the North Carolina Department of Environmental Quality (NC DEQ).

In the event that raw sewage (in any quantity) is spilled, discharged, leaked or otherwise deposited in the open environment, due to the Contractor's work, the Contractor is responsible for any cleanup of solids and disinfection of the area affected. This work will be performed at the Contractor's expense with no additional cost to the Fayetteville Public Works Commission. The Contractor is also responsible for complying with any and all regulatory requirements in regards to the size spill with no additional cost to the Fayetteville Public Works Commission. The Contractor shall cooperate fully with the Fayetteville Public Works Commission and the applicable State agencies in responding to and cleaning up the spill. Any work completed by the Fayetteville Public Works Commission in responding to a spill caused by the Contractor's operations shall be billed to the Contractor.

Where sewage has backed up into a property due to any aspect of the Contractor's operation, the Contractor shall immediately notify the Fayetteville Public Works Commission, inspect the property with the Fayetteville Public Works Commission and agree on remedial measures. The Contractor shall be responsible for all cleaning, repair and/or replacement of damaged property, temporary relocation of all occupants of the affected properties, if required, all to the satisfaction of the property owner. These actions shall be undertaken immediately upon learning of the backup. Cleaning shall be performed by firms specializing in this type of work. All costs associated with the cleaning, repair, replacement of damages, occupant accommodations, insurance and spill remediation shall be borne by the Contractor. All remediation measures required as part of a spill response are part of acceptance of the project, and final payment shall not be made until such time all required measures are addressed and approved by the appropriate regulatory agency.

**DIVISION 2
SITE WORK**

02763 MANHOLE LINING – FIBERGLASS REINFORCED EPOXY

GENERAL

The Contractor shall furnish all labor, materials, equipment and incidentals required and install the monolithic fiberglass reinforced epoxy manhole lining system and appurtenances as specified herein. The lining system shall be used to rehabilitate the interior of all designated existing sewer manholes as indicated within these Contract Documents and as shown on the Contract Drawings. The installed lining system shall be a structurally designed liner, meeting or exceeding all specified physical properties. The installed lining system shall withstand all loading conditions and hydrostatic pressure.

The manhole lining system shall consist of a cementitious base coat applied to the cleaned and prepared manhole surfaces, followed by the fiberglass reinforced epoxy lining system. The Contractor shall furnish all necessary materials, labor, and equipment necessary to properly prepare the surfaces and apply the fiberglass reinforced epoxy lining system as specified herein.

The Contractor is responsible for properly preparing the existing manhole for lining prior to the installation of the lining system, including stopping all leaks, flow control, patching voids, removing steps/manhole rungs, cleaning (to include water blasting), removing rubble, root, removal, debris removal, etc.

The Contractor is advised that the presence or absence of any leakage through the manhole walls as seen in the Contractor's independent inspection prior to bidding is dependent upon the ground water levels and conditions at the time of the inspections. The Contractor shall reflect his/her assumptions and judgments on leakage through the manhole walls based on this information in the unit prices bid. All leakage shall be stopped prior to installing the lining system. No additional payment will be made to the Contractor for repairing leaks not visible prior to bidding.

Cleaning, surface preparation, lining application, and thicknesses shall be as specified herein and shall meet or exceed the lining manufacturer's recommendations. When the manufacturer's minimum recommendations exceed the specified requirements, the Contractor shall comply with the manufacturer's minimum recommendations.

RELATED SECTIONS

- A. Section 02500 – Traffic Control
- B. Section 02730 – Sanitary Sewer System
- C. Section 02750 – Wastewater Flow Control
- D. Section 02765 – Manhole Chimney Seals

REFERENCE STANDARDS

This Section contains references to the governing standards and documents listed below. They are a part of this Section as specified and modified; the current version shall apply unless otherwise noted. In case of conflict between the requirements of this section and those of the listed documents, the more stringent of the requirements shall prevail.

A. American Concrete Institute (ACI)

- a. ACI 224.1R – Causes, Evaluation and Repair of Cracks in Concrete Structures
- b. ACI 301 – Specifications for Structural Concrete
- c. ACI 308R – Guide to Curing Concrete
- d. ACI 350 – Code Requirements for Environmental Engineering Concrete Structures and Commentary
- e. ACI 515 – A Guide to the use of Waterproofing, Dampproofing, Protective, and Decorative Barrier Systems for Concrete
- f. ACI 546.R – Concrete Repair Guide
- g. ACI 546.3R – Guide for the Selection of Materials for the Repair of Concrete

B. ASTM International (ASTM)

- a. ASTM C 868 – Standard Test Method for Chemical Resistance of Protective Linings
- b. ASTM C 1583/1583M – Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)
- c. ASTM D 2794 – Standard Test Method for Resistance of Organic Linings to the Effects of Rapid Deformation (Impact)
- d. ASTM D 4060 – Standard Test Method for Abrasion Resistance of Organic Linings by the Taber Abraser
- e. ASTM D 4285 – Standard Test Method for Indicating Water or Oil in Compressed Air
- f. ASTM D 4263 – Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
- g. ASTM D 4414 – Standard Practice for Measurement of Wet Film Thickness by Notch Gages
- h. ASTM D 4541 - Standard Test Method for Pull-off Strength of Coatings Using Portable Adhesion Testers
- i. ASTM D 6944 Standard Test Method for Measuring Humidity with a Psychrometer
- j. ASTM D 7682 – Standard Test Method for Replication and Measurement of Concrete Surface Profiles Using Replica Putty
- k. ASTM F 1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
- l. ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
- m. ASTM F 2414 – Standard Practice for Sealing Sewer Manholes Using Chemical Grouting
- n. ASTM G 210 – Standard Practice for Operating the Server Wastewater Analysis Testing Apparatus

C. International Concrete Repair Institute (ICRI)

- a. Guideline No. 310.1R – Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion
- b. Guideline No. 310.2 – Selecting and Specifying Concrete Surface Preparation for Sealer, Linings, and Polymer Overlays

D. National Association of Corrosion Engineers International (NACE)

- a. NACE Publication 6D-173 – A Manual for Painter Safety
- b. NACE SP0188 – Standard Practice for Discontinuity (Holiday) Testing of Protective Linings
- c. NACE SP0892 – Standard Practice for Coatings and Linings over Concrete for Chemical Immersion and Containment Service
- d. NACE No. 6/SSPC-SP13 – Surface Preparation of Concrete

E. Occupational Safety and Health Administration (OSHA)

- a. Safety and Health Standards (29 CFR 1910/1926)

F. The Society for Protective Coatings (SSPC)

- a. SSPC-SP13/NACE No. 6 – Surface Preparation of Concrete
- b. SSPC-Guide 12 – Guide for Illumination of Industrial Painting Projects

G. Standard Practice for the Rapid Evaluation of Coatings and Linings by Severe Wastewater Analysis Test (S.W.A.T.)

Unless otherwise specified, references to documents shall mean the documents in effect at the time of receipt of Bids. If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents or the last version of the document before it was discontinued.

In case of conflicting requirements between this specification and these referenced documents, the more stringent shall govern.

SUBMITTALS

Submit, in accordance with Section 01300 – Submittals and Section 01000 – Special Conditions, letters, shop drawings, and product data showing materials of construction, installation equipment and details of installation for the monolithic lining system including:

1. Product Data Sheets: Copies of current technical data for each component specified and applied as outlined in this Section.

2. Safety Data Sheets: Copies of current SDS for any materials brought on-site including all clean-up solvents, repair or resurfacing mortars and lining materials.
3. Qualification Data: Approved Installer Training Certificates from manufacturer.
4. Performance Testing Reports: Copies of test data for the entire physical, chemical, and permeation properties listed herein and as outlined within this Section.
5. Installation Instructions: Manufacturer's written installation instructions for the materials specified in this Section.
6. Construction Details: Copies of manufacturer's computer generated standard lining details for specified materials, including: leading edge termination, metal embedment in concrete, joint detail, wall-to-slab detail, pipe termination detail, and any other detail at the request of the Public Works Commission.

GUARANTEE

The installed lining system shall be guaranteed by the Contractor and Manufacturer for a period of five (5) years from the date of final acceptance. During this period, all defects discovered in the lining, as determined by the Public Works Commission, shall be repaired or replaced in a satisfactory manner by the Contractor at no cost to the Public Works Commission. All proposed repairs shall be submitted, reviewed, and approved by the Public Works Commission prior to the Contractor completing any work.

QUALITY ASSURANCE

The Contractor shall be responsible for the provisions of all test requirements specified in the above referenced ASTM Standards as applicable. In addition, all lining products to be installed under this Contract may be inspected at the plant for compliance with these specifications by an independent testing laboratory provided by the Public Works Commission. The Contractor shall require the manufacturer's cooperation in these inspections. The cost of plant inspection of all lining products and materials approved for this Contract shall be borne by the Public Works Commission.

Inspections of the lining products and materials may also be made by the Public Works Commission after delivery. The lining products and materials shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though samples may have been accepted as satisfactory at the place of manufacture. Lining materials rejected after delivery shall be marked for identification and shall be removed from the job at once.

The Contractor shall initiate and enforce quality control procedures in accordance with the applicable ASTM, NACE, and SSPC standards, and in accordance with the manufacturer's instructions.

Acceptable Manufacturers: A company with a minimum of five (5) years experience in manufacturing of, and providing technical service for chemical resistant systems equivalent to those specified herein.

The manufacturer of the lining system of manholes shall be a company that specializes in the design and manufacture of corrosion protection systems for manholes. The Contractor shall be completely trained in leak repair, surface preparation, installation of the lining system, and corrosion materials application on manholes. The lining system materials/products shall be suitable for installation in a severe hydrogen sulfide environment without any deterioration.

The Contractor shall be trained and certified by the manufacturer for the handling, mixing, application and inspection of the manhole lining system as described herein.

DELIVERY, STORAGE AND HANDLING

Care shall be taken in shipping, handling and placing to avoid damaging the lining products. Extra care may be necessary during cold weather construction. Any lining product or material damaged in shipment shall be replaced as directed by the Public Works Commission.

Any lining product showing deterioration, or which has been exposed to any other adverse storage condition that may have caused damage, even though no such damage can be seen, shall be marked as rejected and removed at once from the work.

While stored, the lining products shall be adequately packaged and protected. The lining products shall be stored in a manner as recommended by the manufacturer. The Contractor shall comply with the following:

1. Store the materials in sealed, original manufacturer's containers.
2. Store materials in a protected area out of direct sunlight.
3. Keep containers clean and undamaged.
4. Comply with manufacturer's published storage temperature and shelf life recommendations.
5. Protect all materials from freezing.

Deliver products to the job site in manufacturer's original, unopened containers bearing manufacturer's name and label and the following information

1. Product name.
2. Product description (generic product classification).
3. Manufacturer's lot number.
4. Color.

All materials shall be handled in accordance with their Safety Data Sheets (SDS) and the manufacturer's instructions.

PRODUCTS

The materials to be utilized in the lining of manholes shall be designed and manufactured to withstand the severe effects of hydrogen sulfide in a wastewater environment. The manufacturer of corrosion protection products shall have a minimum of 10 years experience in the production of the lining products utilized and shall have satisfactory installation record. All rehabilitation products shall be manufactured by a single

manufacturer, or the Contractor shall provide documentation that the materials are compatible with each other.

All lining materials shall be approved by U.S. EPA for sewer system rehabilitation.

The lining system shall be compatible with the thermal condition of the existing sewer manhole surfaces. Surface temperatures will range from 20°F to 100°F.

Any fiberglass reinforced epoxy lining system that cannot provide test results of ASTM G 210 will not be approved for this application. (ASTM G 210– Standard Practice for Operating the Severe Wastewater Analysis Testing Apparatus).

The fiberglass reinforced epoxy lining system shall provide a minimum service life of 50 years.

INFILTRATION CONTROL MATERIAL

Infiltration control materials shall be rapid-setting, high early strength, hand applied cementitious material for stopping infiltrating water and making repairs to concrete, brick or other masonry constructed manholes. The material shall be non-shrinking, non-metallic and non-corrosive. It shall be formulated at the factory and supplied in factory sealed and labeled pre-measured containers. The material shall be compatible with the lining material to be used. The material shall have the following minimum characteristics:

1. Compressive strength (in accordance with ASTM C109):

1 hour	1,000 psi
1 day	2,400 psi
7 day	3,500 psi
28 day	4,500 psi

2. Tensile strength (in accordance with ASTM C-109):

1 day	175 psi
7 day	250 psi
28 day	350 psi

3. Bond Strength (in accordance with ASTM C-321)

30 minutes	50 psi
1 day	85 psi

4. Freeze-Thaw Durability (in accordance with ASTM C-666)

100 cycles	no loss
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5. Set Time (in accordance with ASTM C-191-92)

Initial	30 to 60 seconds
Final	1 hour

6. Shrinkage (in accordance with ASTM C-157) – 0%

Infiltration control material shall be CEMTEC Hydraulic Cement by A.W. Cook Cement; Mainstay ML-10 by Madewell Products Corporation; PLS-505 by Protective Liner Systems; Quad-Plug by Quadex; or approved equal.

Chemical sealants or grouts used to seal active manhole leaks, to patch cracks, to fill voids and to otherwise prepare the manhole surfaces for the lining installation shall be suitable for the intended purpose and shall be compatible with the lining system as certified by the manufacturer.

All leaks shall be stopped prior to the installation of the lining system.

PATCHING MATERIAL

Voids in the existing manhole walls, benches, or damaged inverts must be repaired prior to installing the lining system. The patching material shall be a rapid setting, high early strength, corrosion resistant hand mixed and hand applied cementitious material intended for filling voids and repairing inverts in concrete, brick or other masonry constructed manholes. It shall be formulated in the factory and supplied in factory sealed and labeled pre-measured containers. The material shall be compatible with the lining material to be used. The material shall have the following minimum characteristics:

1. Compressive strength (in accordance with ASTM C109):

1 day	3,500 psi
7 day	4,900 psi
28 day	5,500 psi

2. Tensile strength (in accordance with ASTM C-109):

1 day	200 psi
7 day	250 psi
28 day	550 psi

3. Freeze-Thaw Durability (in accordance with ASTM C-666)

100 cycles	no loss
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4. Set Time (in accordance with ASTM C-191-92)

Initial	15 to 20 minutes
Final	20 to 25 minutes

Patching material shall be CEMTEC Rapid Cure Vertical Grade by A.W. Cook Cement; Mainstay ML-72 by Madewell Products Corporation; Hyperform by Quadex; or approved equal.

All voids and other repairs shall be completed prior to the installation of the lining system.

CEMENTITIOUS BASE COAT

The use of a cementitious base coat shall be required for all lining systems. The cementitious base coat

shall be a pumpable Portland based 100% pure calcium aluminate cement. The lining shall be installed via trowel or low-pressure application. The materials shall be suitable for all the specified design conditions.

The cementitious base coat shall be a system suitable for use as a trowel- or spray-applied monolithic surfacing in sewer manholes. The cementitious lining system shall be Mainstay ML-CA by Madewell Products Corporation; Aluminaliner by Quadex; CEMTEC Silatec CAM by A.W. Cook Cement; PLS-507 by Protective Liner Systems; or approved equal.

The cementitious base coat shall be applied to the following minimum total thicknesses for all lining systems:

- 1. For block and cast concrete manholes in good condition, apply to a minimum thickness of 0.5 inch.**
- 2. For all brick manholes and for block or cast concrete manholes in poor condition, apply to a minimum thickness of 1.0 inch.**

It is the Contractor's responsibility to determine the required thickness of the cementitious base coat, based on the manhole condition, groundwater conditions, etc. to ensure the long-term integrity of the installed lining system.

The cementitious base coat shall be installed on the walls of existing manholes, from the invert to the manhole frame, as further directed below. All cementitious lining shall be troweled to consolidate the material, and then brushed to provide a profile surface for application of the polymeric topcoat. The initial trowelling shall be done in an upward motion, to compress the material into voids. The Contractor shall ensure that the cement is not over-troweled. The cured cementitious base coat surface shall be continuous with proper sealing connections to all unsurfaced areas. The Contractor shall take all measures to ensure that the cementitious base coat properly cures. The use of curing compounds is prohibited.

The materials used in the cementitious base coat shall be mixed on site in accordance with the manufacturer's recommendations. Water shall only be added to the materials during the mixing process and prior to material pumping or spray application. No water shall be added at the nozzle.

The cementitious base coat, when cured, shall have the following minimum characteristics at 28 days as measured by the applicable ASTM standards referenced herein:

1. Density (when applied) – 135 pounds/cubic foot, plus/minus 5 pounds/cubic foot
2. Compressive strength (in accordance with ASTM C109):

1 day	2,800 psi
28 day	8,000 psi
3. Bond Strength (in accordance with ASTM C-321)

28 day	1,700 psi
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4. Flexural Strength (in accordance with ASTM C-78
28 day 1,500 psi
5. Shrinkage (in accordance with ASTM C-157) – 0%
6. Freeze-Thaw Durability (in accordance with ASTM C-666)
300 cycles no loss

The cured cementitious base coat shall be continuously bonded to all the brick, mortar, concrete, chemical sealant, grout, pipe and other surfaces inside the sewer manhole.

Where the manhole to be rehabilitated is subject to vehicular traffic, the cementitious lining shall be installed to no closer than one (1) inch below the bottom of the manhole frame so as to avoid transfer of impact loads to the new liner. Where the manhole to be rehabilitated is not subject to vehicular loads, the cementitious liner shall be continuous up to the manhole frame.

FIBERGLASS-REINFORCED EPOXY RESIN LINING SYSTEM

Materials

The manhole lining system shall be a fiberglass-reinforced epoxy resin lining system suitable for use as a monolithic surfacing in sewer manholes. The lining system shall be the PLS-650 PerpetuWall system by Protective Liner Systems, or approved equal.

The fiberglass reinforcing fabric shall be a bonded fabric of Type E glass, having a minimum tensile strength of 500,000 psi; a minimum modulus of elasticity of 10,500,000 psi; and a maximum elongation of 4.8%. The fiberglass reinforcing fabric shall be a stitch-bonded construction with a chemical binder to enhance handling and adhesion. The fiberglass reinforcing fabric shall be PLS-811, as supplied by Protective Liner Systems, or approved equal.

The epoxy resin system shall be a two-component, 100% solids that emits no toxic odors; modified epoxy coating that can be applied to dry, damp, or wet surfaces. The epoxy resin system shall have the following minimum physical properties:

- | | | |
|----|----------------------|---------------|
| 1. | Hardness | 68-72 Shore D |
| 2. | Tensile Strength | 12,400 psi |
| 3. | Compressive Strength | 16,800 psi |
| 4. | Flexural Strength | 13,900 psi |
| 5. | Impact Resistance | 160 in-lbs |
| 6. | Heat Distortion Temp | 220 Degrees F |

7. Ultimate Elongation 4.5%

The epoxy resin system shall be PLS-613 EpoxyCoating or PLS-614 EpoxyMastic (also referred to as PerpetuCoat LT or PerpetuCoat) as manufactured by Protective Lining Systems; or approved equal.

The lining system top coat shall be an epoxy polymer protective barrier material specifically designed to protect concrete and steel surfaces in severe wastewater environments, including associated abrasive physical attack and chemical attack from sewer gases and organic acids generated by microbial sources.

The top coat materials shall be hand applied to the minimum dry film thickness of 150 mils.

The epoxy resin materials shall be suitable for sewer system service and chemically resistant to any chemicals or vapors normally found in domestic, commercial, and/or industrial sewage. The epoxy resin materials shall be compatible with the cementitious base coat material, as per manufacturer's recommendations.

Installation

The fiberglass reinforced epoxy lining system shall be installed over the cementitious base coat previously applied on the inverts, benches, and walls of the designated manholes. The fiberglass reinforced epoxy liner shall be applied only after the cementitious base coat has properly cured, in accordance with the manufacturer's instructions.

The Contractor shall saw-cut the existing walls, benches, and/or inverts in order to "tie-in" the fiberglass reinforced epoxy lining.

The cured surface of the fiberglass reinforced epoxy lining system shall be smooth and continuous with proper sealing connections to all unsurfaced areas. The liner shall be troweled to consolidate the product into the profile of the substrate or resurfacing mortar.

When cured, the monolithic fiberglass reinforced epoxy lining system shall form a continuous, tight-fitting, hard, impermeable surfacing which is suitable for sewer system service and chemically resistant to any chemicals or vapors normally found in domestic, commercial, and/or industrial sewage. The fiberglass reinforced epoxy lining shall be continuously bonded to the cementitious base coat.

Where the manhole to be rehabilitated is subject to vehicular traffic, the fiberglass reinforced epoxy lining system shall be installed to no closer than one (1) inch below the bottom of the manhole frame so as to avoid transfer of impact loads to the new liner. In those locations where the manhole is subject to vehicular traffic, a chimney seal shall be installed to "bridge" the gap between the manhole frame and the fiberglass reinforced epoxy lining system. Where the manhole to be rehabilitated is not subject to vehicular loads, the fiberglass reinforced epoxy lining system shall be continuous up to the manhole frame.

The fiberglass reinforced epoxy lining system shall not be applied to the manhole frame. The Contractor shall ensure that no material is placed on the manhole frame, to allow the locking cover (as applicable) to properly function.

INSTALLATION

GENERAL

All work shall be in accordance with these Contract Documents and as directed by the Public Works Commission.

The Contractor shall comply with all local, State and Federal regulations including those set forth by OSHA, EPA, the Public Works Commission and any other applicable authorities.

Prior to conducting any work, the Contractor shall perform an inspection of the structure to determine the need for protection against hazardous gases or oxygen depleted atmosphere and the need for flow control or flow diversion.

The Contractor shall clean each sewer manhole and shall properly dispose of any resulting material. The Contractor shall take all necessary precautions to not allow any debris from their operations to enter the sewer system. In the event debris or any other material from the Contractor's operation enters the sewer system, the Contractor shall immediately contact the Public Works Commission. The Contractor shall then commence every effort to retrieve the debris. The Contractor shall continue to search for the debris until instructed otherwise by the Public Works Commission.

All surface washing, abrasive blasting, waterjetting, grinding, patching, filling and preparation shall be completed by the Contractor in accordance with the lining system manufacturer's recommendations.

The Contractor shall notify all property owners who discharge sewage directly to the manhole being rehabilitated that their service will be discontinued while the lining system is being installed, cured and active pipe and service connections reopened. The Contractor shall notify individual property owners at least 48 hours in advance, giving the date, start time and estimated completion time for the work being conducted.

Application procedures shall conform to recommendations of the manufacturer, including materials handling, mixing, environmental controls during application, safety and spray equipment. Material shall not be applied during freezing weather conditions. No material shall be placed when the ambient air temperature is below 40°F, or when the temperature is anticipated to fall below 32°F in the next 24 hours.

Spray equipment shall be specifically designed to accurately ratio and apply the liner system.

SURFACE PREPARATION

Surface preparation methods may include high pressure water cleaning, hydro blasting, abrasive blasting, grinding, detergent water cleaning, and shall be suited to provide a surface compatible for installation of the liner system. Remove all dust, biological growths, grease, oil, paint or any other surface contaminants or coatings from all surfaces to be lined, including manhole walls, corbelling and manhole frame. The choice of surface preparation (including disinfection as necessary) lies solely with the Contractor. The

Contractor shall determine the required surface preparation method based upon the condition of the manhole, the presence of potential contaminants, access to perform the work, and the required condition of the surface to apply to specified lining system, as required by the manufacturer.

The surface preparation method shall produce a cleaned, abraded and sound surface with no evidence of laitance, loose concrete, brick or mortar, contaminants or debris, and shall display a surface profile suitable for application of the manhole lining system. The Contractor shall prepare the surface in accordance with the applicable NACE and/or SSPC recommendations for the specified lining system.

Coatings that cannot be removed shall be properly prepared (in accordance with these Specifications) to obtain and insure adequate bonding of the cementitious base coat material.

The Contractor shall conduct a visual inspection of each manhole after it is cleaned. All active infiltration leaks shall be plugged or sealed with an appropriate infiltration control material compatible with the cementitious base coat. The Contractor shall remove all loose mortar and rubble from existing walls, benches and inverts. Repairs to exposed rebar, defective pipe penetrations or inverts, etc. shall be repaired utilizing non-shrink grout or approved alternative method. The Contractor shall prepare manhole to receive the cementitious base coat as necessary by reshaping and repairing benches, inverts, and walls where required. All interior surfaces shall be prepared as recommended by the base coat lining manufacturer. Minimum requirements are as listed below.

1. All cracks and other voids must be repaired and filled with suitable non-shrinking cements, sealants or grouts, including all voids between the existing sewer pipes and manhole walls. Patching compounds shall be compatible with the proposed lining system. All patches shall be smooth and even with the manhole wall.
2. All existing manhole rungs/steps shall be removed and the void patched or cut off and ground smooth.
3. All surfaces shall be suitably prepared for the required bonding of the cementitious base coat as recommended by the manufacturer.

Concrete surfaces to be coated shall be free of curing compounds and form release agents, laitance and foreign particles that may inhibit bonding. Prior to the start of the protective coating system application, the Contractor shall pre-clean as required, and inspect the substrate in accordance with SSPC-SP13/NACE No. 6, Severe Service. Surface preparation procedures shall be in accordance with NACE SP0892, SSPC-SP13/NACE No. 6 and ICRI Guideline No. 310.2. Surface preparation shall expose aggregate and obtain a uniform surface texture resembling the minimum recommended concrete surface ICRI-CSP profile. The Contractor shall remove all dust, biological growths, grease, oil, paint or any other surface contaminants or coatings from all surfaces to be lined, including any metal work to be coated.

Existing Concrete Application: Existing concrete structures to receive the protective coating system must be capable of withstanding imposed loads. All oil, grease, waste and chemical contaminants shall be removed from the surface of the concrete prior to preparation in accordance with NACE SP0892 and SSPC-SP13/NACE No. 6. Concrete surfaces must be sound and capable of supporting the proposed lining system. Surface preparation requirement is to expose a sound, uniform surface texture confirming to the

minimum recommended ICRI-CSP. The appropriate cementitious repair mortar or epoxy cementitious repair material shall be applied to the entire, prepared surface to level surface suitable for coating.

Commencement of the Work of this Section shall indicate that the substrate and other conditions of installation are acceptable to the Contractor, and will produce a finished product meeting the requirements of these Contract Documents. All defects resulting from accepted conditions shall be corrected by Contractor at his own expense.

All concrete surfaces shall be prepared to a minimum of SSPC-SP13 prior to installation of the specified lining system.

Level or grind concrete substrates to produce a uniform and smooth surface, including removal of all sharp edges, ridges, form fins, and other concrete protrusions.

FLOW CONTROL

It is the intent of these Contract Documents that the Contractor will utilize flow-through plugs or other means to complete the manhole rehabilitation without the use of a temporary sewer bypass system. All temporary flow-through plugs shall be removed upon the completion of each step of the rehabilitation process (cementitious base coat, polymeric top coat). The Contractor shall be responsible for ensuring that their flow control system does not result in any sanitary sewer being discharged to the environment.

If required to properly complete the lining, the Contractor shall provide temporary bypass pumping of sewage flows where and when the rehabilitation work is being performed. The temporary bypass pumping shall be in accordance with Specification Section 02750 – Wastewater Flow Control and these Contract Documents.

INFILTRATION CONTROL

After surface cleaning, any visible leaks or infiltration shall be stopped, prior to installation of any patching material or the cementitious base coat. Infiltration and leaks shall be stopped utilizing hydraulic cement or other “typical” methods (i.e., oakum). It is the intent of these Contract Documents that the Contractor will take all necessary steps to stop all but the very large leaks without the use of chemical grout. Should a significant, very large leak be encountered that would require significant effort, large quantities of chemical grout, and/or other extreme measures, the method and cost to stop that leak shall be mutually agreed upon by the Contractor and the Public Works Commission prior to commencing work.

A complete, watertight seal shall be provided at pipe and manhole wall connections. The Contractor shall submit details of how the watertight connections will be made to the Public Works Commission for review and approval.

REPAIR OF BENCHES AND INVERTS

The Contractor shall complete any necessary repairs to the bench and/or invert of the manhole, prior to installation of the specified lining system. All repairs shall be completed in accordance with the

requirements of the Public Works Commission, and as outlined herein.

The invert channel shall be constructed of brick and mortar, in accordance with Public Works Commission standard details. The invert channel shall be smooth and semicircular in shape conforming to the inside of the connecting sewer section. Changes in direction of flow shall be made with a smooth curve as large as a radius as the size of the manhole will permit without a decrease in flow velocity. Changes in size and grade of the channel shall be made gradually and evenly. A shelf shall be provided on each side of any manhole invert channel. Inverts in manholes with standing water will not be acceptable.

CEMENTITIOUS BASE COAT

The Contractor shall furnish and place the cementitious base coat in each manhole as and where directed by the Public Works Commission. The installation of the cementitious base coat shall be in complete accordance with the manufacturers' specifications.

Prior to placing the cementitious base coat, the Public Works Commission and the Contractor must inspect and approve the surface preparation work. The Contractor shall notify the Public Works Commission when the manholes are ready for inspection. The Contractor is responsible for ensuring proper installation conditions including surface preparation, temperature, and moisture.

All bottom and horizontal surfaces shall have the cementitious base coat material applied to the required thickness by hand troweling or spray-on methods. All cementitious lining shall be troweled to consolidate the material, and then brushed to provide a profile surface for application of the epoxy resin topcoat. The initial troweling shall be done in an upward motion, to compress the material into voids.

All side vertical surfaces shall have the cementitious base coat applied to the required thickness in one pass or application. Non-vertical surfaces may be completed in multiple passes to prevent sloughing of material.

Temperature limitations must be handled as appropriate and as approved by the manufacturer.

FIBERGLASS-REINFORCED EPOXY RESIN LINING SYSTEM

Prior to placing the epoxy resin lining system, the Public Works Commission and the Contractor must inspect and approve the cementitious base coat. The Contractor shall notify the Public Works Commission when the manholes are ready for inspection. The Contractor is responsible for ensuring proper installation conditions including the cementitious base coat conditions, temperature and moisture. The cementitious base coat shall be properly cured prior to installation of the lining system.

The Contractor shall install an initial application of the epoxy resin system to a minimum thickness of 100 mils over the previously installed cementitious base coat. Prior to the epoxy resin system setting up, the Contractor shall place the fiberglass fabric over the epoxy resin, and press the fabric into the resin. The fabric shall be fully covered by the epoxy resin. Each section of fabric shall overlap the previous section of fabric a minimum of two (2) inches. Additional epoxy shall be applied at the fabric seams to ensure a monolithic lining system. The fiberglass fabric shall be top coated with the epoxy resin, to ensure

complete saturation and encapsulation of the fiberglass fabric.

The finished liner thickness shall be a minimum of 150 mils.

The fiberglass-reinforced epoxy resin lining system shall be applied to all interior manhole surfaces. The Contractor shall saw-cut the existing walls, benches, and/or inverts in order to “tie-in” the fiberglass reinforced epoxy lining system.

All surfaces shall have the lining system applied by a spray-on method or by hand troweled applications to build up to the required thickness.

Temperature limitations must be handled as appropriate and as approved by the manufacturer.

FIELD QUALITY CONTROL

The Contractor to perform the quality control procedures listed below in conjunction with the requirements of this Specification Section.

- A. Inspect all materials upon receipt to ensure that all are supplied by the approved Manufacturer.
- B. Surface pH Testing: The pH of the concrete substrate will be measured using pH indicating papers. The pH testing is to be performed once every 50 square feet. Acceptable pH values shall be a minimum 9.0 as measured using color indicating pH paper with readable color calibrations and a scale at whole numbers (minimum). Use Hydriion Insta-Check Jumbo 1-12, or approved equal. The paper shall be touched to the surface once using moderate gloved finger pressure. The surface shall not be wiped or moved laterally to disturb the surface during pH testing. Following the one touch, lift the paper vertically to not "wipe" the surface. Compare the color indicated with the scale provided and record the pH. Spot check any questionable areas with a 1% phenolphthalein solution. The phenolphthalein solution shall turn bright pink on concrete.

TESTING

During application of the epoxy resin lining system, the Contractor shall measure the thickness and uniformity of the material by the use of a wet film thickness gage meeting the requirements of ASTM D 4414. Measurements shall be completed in the presence of the Public Works Commission. The Contractor shall document all measurements for each manhole and submit the documentation to the Public Works Commission. The documentation shall be submitted with each pay application.

Field acceptance of the manhole lining system shall be based on the Public Works Commission's evaluation of the appropriate installation of the cementitious base coat and fiberglass reinforced epoxy resin system per field inspections and on observation of the installation. Acceptance shall also be based on the Public Works Commission's evaluation of the curing test data and final testing.

The fiberglass reinforced epoxy lining top coat shall provide a continuous monolithic surfacing with uniform thickness throughout the manhole interior and be free of pinholes, slumps and drips. A visual

inspection shall be conducted to ensure that no pinholes are in the monolithic coating. The visual inspection shall include terminations and transitions of the installed lining system.

Once the lining system has fully cured, it shall be checked via high voltage spark detection, in accordance with NACE SP0188 and the manufacturer's instructions. All defects shall be corrected at no cost to the Public Works Commission. The high voltage spark detection shall be done in accordance with:

1. The manhole environment shall be properly vented prior to testing to ensure hazardous conditions do not exist.
2. The high voltage spark detection equipment shall be set at 100 volts per one (1) mil of applied film thickness, or as recommended by the manufacturer.
3. All detected holidays shall be marked and the area of the liner shall be repaired. The surface area around the defect in the liner shall first be abraded using an appropriate grit paper or other hand abrasion tool. After abrading and cleaning the area, the area shall be patched by hand application of the fiberglass reinforced epoxy lining topcoat material. All repair procedures shall follow manufacturer's recommended procedures.
4. All repaired areas shall be spark tested.

The Contractor is expected to perform preliminary spark testing prior to scheduling a final test with the Public Works Commission. Any defects noted during this preliminary testing shall be repaired in accordance with these specifications and the manufacturer's recommended procedures.

ACCEPTANCE

The Public Works Commission shall complete a final inspection of each manhole, to include a visual inspection to verify that no leakage through the manhole wall is occurring, the manhole has been rehabilitated in accordance with the Contract Documents, and witness the final spark test. The Public Works Commission shall visually inspect every manhole and shall observe the final spark testing for every manhole. The Contractor shall coordinate with the Public Works Commission to schedule the final inspection. Any deficiencies noted during the final inspection shall be repaired in accordance with these specifications and the manufacturer's recommended procedures.

Inspection by the Public Works Commission does not absolve the Contractor from their responsibility for quality control inspection and testing as specified in these Contract Documents or as required by the manufacturer's instructions.

There shall be no groundwater infiltration or other leakage through the manhole wall after it has been lined. If leakage is found, it shall be eliminated with an appropriate method as recommended by the liner manufacturer and approved by the Public Works Commission. Any leakage shall be sealed utilizing materials compatible with the lining system, in accordance with the manufacturer's directions, and as approved by the Public Works Commission. The repair materials shall have the same life expectancy of the installed lining system. All repair materials shall be properly cured in accordance with the manufacturer's instructions. The use of curing compounds is prohibited.

All pipe connections shall be open and clear.

There shall be no cracks, voids, pinholes, slumps, drips, uncured spots, dry spots, lifts, delaminations or other type defects in the lining. The fiberglass reinforced epoxy lining shall provide a continuous monolithic surface with uniform thickness throughout the manhole.

If any defective lining is discovered after it has been installed, it shall be repaired or replaced in accordance with the manufacturer's recommendations and in a satisfactory manner to the Public Works Commission. This requirement shall apply for the entire guarantee period.

The Contractor shall demonstrate that the installed lining system does not interfere with the proper sealing and locking (as applicable) of the manhole cover. Upon completion of the spark testing, all manholes shall be locked (if so equipped). For those manholes within paved areas, the Contractor shall apply four (4) dollops of roofing tar to the frame, to eliminate the cover from rattling. The dollops shall be equally spaced around the frame. The Public Works Commission Project Coordinator shall verify that the manholes are secured (locked and/or tarred).

At the completion of the Work, the Contractor shall remove all materials and debris associated with the Work of this Section.

The Contractor shall clean all surfaces not designated to receive the specified lining system. The Contractor shall restore all other work in a manner acceptable to the Public Works Commission.

The installed lining system shall be protected from damage until Final Acceptance of the Work. Any damage to the installed lining system shall be repaired or replaced at the discretion of the Public Works Commission, at no additional cost to the Public Works Commission.

*** END OF SECTION ***

DIVISION 2 SITE WORK

02765 MANHOLE CHIMNEY SEALS

GENERAL

The Contractor shall furnish all labor, materials, equipment, and incidentals required and install the manhole chimney sealing system and appurtenances as specified herein. The internal manhole sealing system shall seal the manhole, from the top of cone up to, and including, the joint between the manhole cone (including all extensions to the chimney area) and the manhole ring. The Contractor shall furnish all necessary materials, labor, and equipment necessary to properly prepare the surface and apply the sealing system. Installation of the sealing system shall be in accordance with these Contract Documents and the manufacturer's recommendations.

All manhole chimney sealing systems shall be installed after the manhole has been relined, unless otherwise directed by the Public Works Commission.

The Contractor shall accurately field measure and size each individual manhole. The Contractor is responsible for performing any and all necessary field measurements, in order to ensure that the sealing system is properly installed in accordance with the requirements of these Contract Documents and the manufacturer.

RELATED SECTIONS

- A. Section 02500 – Traffic Control
- B. Section 02762 – Manhole Lining – Polymeric
- C. Section 02763 – Manhole Lining – Cured-in-Place

REFERENCE STANDARDS

The following American Society for Testing and Materials (ASTM) standards are incorporated by reference into this specification. The latest edition of the reference shall be used.

- A. ASTM D412-06ae2 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension
- B. ASTM D2240-97e1 – Standard Test Method for Rubber Property - Durometer Hardness

In case of conflicting requirements between this specification and these referenced documents, this specification will govern.

SUBMITTALS

All submittals shall be provided in accordance with Section 01000 – Special Conditions and Section 01300 – Submittals.

GUARANTEE

All sealing systems installed shall be guaranteed by the Contractor for a period of five (5) years from the date of final acceptance. During this period, all defects discovered in the sealing system, as determined by the Public Works Commission, shall be repaired or replaced in a satisfactory manner by the Contractor at no cost to the Public Works Commission.

QUALITY ASSURANCE

The supplier shall be responsible for the provisions of all test requirements specified in the above referenced ASTM Standards as applicable. In addition, all products to be installed under this Contract may be inspected at the plant for compliance with these specifications by an independent testing laboratory provided by the Public Works Commission. The Contractor shall require the manufacturer's cooperation in these inspections. The cost of plant inspection of all products and materials approved for this Contract shall be borne by the Public Works Commission.

Inspections of the products and materials may also be made by the Public Works Commission after delivery. The products and materials shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though samples may have been accepted as satisfactory at the place of manufacture. Materials rejected after delivery shall be marked for identification and shall be removed from the job at once.

The manufacturer and/or applicator of the sealing system shall be a company that specializes in the design, manufacture or installation of corrosion protection systems for manholes. The applicator shall be completely trained in the installation of the sealing system in manholes. The sealing system shall be suitable for installation in a severe hydrogen sulfide environment without any deterioration to the liner.

The applicator shall be trained and certified by the manufacturer for the handling, mixing, application and inspection of the manhole sealing system as described herein.

DELIVERY, STORAGE AND HANDLING

Care shall be taken in shipping, handling and placing to avoid damaging the sealing system products. Extra care may be necessary during cold weather construction. Any sealing system product or material damaged in shipment shall be replaced as directed by the Public Works Commission.

Any sealing system product showing deterioration, or which has been exposed to any other adverse storage condition that may have caused damage, even though no such damage can be seen, shall be marked as rejected and removed at once from the work.

While stored, the sealing system products shall be adequately packaged and protected. The sealing system products shall be stored in a manner as recommended by the manufacturer.

PRODUCTS

SEALING SYSTEM

The materials to be utilized in the sealing of manhole chimneys shall be designed and manufactured to withstand the severe effects of hydrogen sulfide in a wastewater environment. Manufacturer of corrosion protection products shall have long proven experience in the production of the lining products utilized and shall have satisfactory installation record.

Equipment for installation of lining materials shall be high quality grade and be as recommended by the manufacturer.

The manhole seal shall be designed to prevent leakage of water into the manhole through the frame joint area and the area above the manhole cone including all extensions to the chimney area. Extensions shall include, but are not limited to: concrete adjustment rings, brick, and/or block material that may have been used to achieve grade.

The manhole seal shall remain flexible allowing for the repeated vertical or horizontal movements of the frame due to frost lift, ground movement or the thermal movement of pavements.

The manhole sealing material shall be made no less than 170 mils of corrosion resistant aromatic flexible urethane resin coating to be applied to the inside wall of the entire chimney area as described above.

The product shall have a minimum elongation of 800% and hardness (Durometer) of 75.

The installed sealing system shall have a minimum tensile and adhesion strengths of 1150 psi and 175 lb./in. respectively.

The manhole sealing system shall conform to the physical requirements of ASTM D- 412.

The lining product shall have an aromatic urethane primer resin on the complete surface.

The sealing system shall line the interior of the adjustment area from the cone/top of the manhole and onto the inside of the casting.

If the manhole has been relined prior to the seal installation the seal shall cover a minimum of 12 vertical inches, as measured from the casting.

PATCHING MATERIAL

Voids in the existing manhole walls must be repaired prior to installing the manhole chimney sealing system. The patching material shall be a rapid setting, high early strength, corrosion resistant hand mixed and hand applied cementitious material intended for filling voids and making repairs in concrete, brick or other masonry constructed manholes. It shall be formulated in the factory and supplied in factory sealed

and labeled pre-measured containers. The material shall be compatible with the sealing system to be used. The material shall have the following minimum characteristics:

1. Compressive strength	ASTM C109	2,000 psi at 24 hours
2. Shrinkage	ASTM C 596	0 percent at 90 percent relative humidity
3. Set time	ASTM C 191-92	3 to 5 minutes

Product shall be Permacast-Patch as manufactured by Action Products Marketing Corp., Strong-Seal QSR by Strong Company, Preco-Patch by Fosroc Inc. or approved equal.

INSTALLATION

The Contractor shall remove all loose and protruding mortar and brick that would interfere with the sealing system's performance. Any protrusions on the casting shall be cut flush to the casting.

Any voids or repairs to the concrete, brick, or block manhole walls shall be repaired and filled with suitable non-shrinking cements, sealants, or grouts. The patching material shall be compatible with the chimney sealing system. All patches shall be smooth and even with the manhole wall. The Contractor shall allow the patching cement to completely cure prior to beginning installation of the chimney sealing system.

The Contractor shall prepare the surface by sandblasting and utilizing an acetone wet wipe to ensure a clean surface as required by the manufacturer. The substrate surface must be free of sand, loose debris, latencies, dust, oil, grease or chemical contamination. A blower or torch may be required to completely dry the substrate surface or as recommended by manufacturer.

All active, hydrostatic infiltration leaks shall be plugged or sealed with an appropriate grout compatible with the sealing system.

The Contractor shall properly mix the sealing system agents (if necessary), in accordance with the manufacturer's instructions.

The Contractor shall ensure that the casting and structure surfaces are clean and dry, prior to application of the primer. Primer shall be applied in accordance with the manufacturer's instructions.

Once the primer has dried in accordance with the manufacturer's instructions, the sealing system shall be applied to the entire chimney area, to include the frame joint area, the area above the manhole cone, and all extensions in the chimney area. The sealing system shall be installed in accordance with the manufacturer's instructions.

The chimney sealing system shall be as manufactured by Sealing Systems, Inc., or approved equal.

APPENDIX C – SDBE FORMS

SDBE CONTRACT PROVISIONS FORM
(FOR CONSTRUCTION)

APPLICATION:

The requirements of the Small Disadvantaged Business Program for participation in the City of Fayetteville's construction contracts are hereby made a part of these contract documents. These requirements shall apply to all contracts regardless of ownership. Copies of the Program may be obtained from:

Public Works Commission
Purchasing Department/DBE Compliance Officer
P.O. Box 1089
Fayetteville, North Carolina 28302
Phone (910) 223-4366
Fax (910) 483-1429
e-mail: mark.cannady@faypwc.com

SDBE COMPLIANCE REQUIREMENTS

1. The Bidder shall provide, **with the bid**, the SDBE CONTRACT PROVISIONS (CONSTRUCTION), properly executed which signifies that the Bidder understands and agrees to the incorporated SDBE contract provisions.
2. The Bidder shall provide **with the bid:**
 - Affidavit B – INTENT TO PERFORM CONTRACT WITH OWN WORKFORCE, in making this certification the Bidder states that the Bidder does not customarily subcontract elements of this type project and will perform all elements of the work with his/her own current work forces; **and**
 - IDENTIFICATION OF SMALL DISADVANTAGED BUSINESS PARTICIPATION – This certifies that on this project the listed small disadvantaged business enterprises will be used as construction subcontractors, vendors, suppliers or providers of professional services. Enter zero dollars indicating no SDBE's are being used with this project; **or**
 - Affidavit A - LISTING OF GOOD FAITH EFFORTS **AND** IDENTIFICATION OF SMALL DISADVANTAGED BUSINESS PARTICIPATION, as certification that those small disadvantaged businesses listed will be used on this project.
3. Upon being named apparent low Bidder, The Bidder shall provide:
 - Affidavit C – PORTION OF WORK TO BE PERFORMED BY SMALL DISADVANTAGED FIRMS, if the portion of the work to be executed by SDBE's is **equal to or greater** than 10% of the Bidders total contract price; or,
 - Affidavit D - GOOD FAITH EFFORTS, if the goal of 10% participation by SDBE's **is not** achieved.

All written statements, certifications or intentions made by the Bidder shall become a part of the agreement between the Contractor and the City of Fayetteville for performance of this contract. Failure to comply with any of these statements, certifications or intentions, or with the SDBE compliance provisions shall constitute a breach of the contract. Any such breach may result in termination of the contract in accordance with the termination provisions contained in the contract. It shall be solely at the option of the City of Fayetteville whether to terminate the contract for breach.

SUBCONTRACTOR PAYMENT REQUIREMENTS:

North Carolina General Statutes 143-134.1 (N.C.G.S.) states that the percentage of retainage on payments made by the prime contractor to the subcontractor shall not exceed the percentage of retainage on payments made by the City of Fayetteville to the prime contractor. Failure to comply with this provision shall be considered a breach of the contract, and the contract may be terminated in accordance with the termination provisions of the contract.

The Contractor shall provide an itemized statement of payments to each SDBE subcontractor before final payment is processed.

Date: _____

(Name of Company)

(Signature)

Attest: _____

(Above Name Typed or Printed)

(Title)

**SDBE COMPLIANCE PROVISIONS
IDENTIFICATION OF SDBE PARTICIPATION**

I, _____
(Name of Bidder)

do hereby certify that on this project, we will use the following small disadvantaged business enterprises as construction subcontractors, vendors, suppliers or providers of professional services.

Firm Name, Address and Phone No	Description	*SDBE Category

*SDBE categories: Black-African Americans (B), Hispanic-Americans (H), Asian- Americans (A), Native-Americans (I), Women (F), Socially/Economically Disadvantaged (D)

The total value of small disadvantaged business contracting will be (\$) _____.

Date: _____

Approved/Certified By: _____
(Name)

(Title)

(Signature)

SDBE COMPLIANCE PROVISIONS AFFIDAVIT A
LISTING OF GOOD FAITH EFFORTS

Affidavit of _____
(Name of Bidder)

I have made a good faith effort to comply under the following areas checked:

(A minimum of 50 value points must be checked in order to have achieved a "good faith effort")

- (1) Contacting minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor or available on State or local government maintained lists at least 10 days before the bid or proposal date and notifying them of the nature and scope of the work to be performed. **Value = Ten (10) points.**
- (2) Making the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bid or proposals are due. **Value = Ten (10) points.**
- (3) Breaking down or combining elements of work into economically feasible units to facilitate minority participation. **Value = Fifteen (15) points.**
- (4) Working with minority trade, community, or contractor organizations identified by the Office for Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses. **Value = Ten (10) points.**
- (5) Attending any pre-bid meetings scheduled by the Owner. **Value = Ten (10) points.**
- (6) Providing assistance in getting required bonding or insurance or providing alternatives to bonding or insurance for subcontractors. **Value = Twenty (20) points.**
- (7) Negotiating in good faith with interested minority businesses and not rejecting them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing. **Value = Fifteen (15) points.**
- (8) Providing assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisting minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit. **Value = Twenty-five (25) points.**
- (9) Negotiating joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible. **Value = Twenty (20) points.**
- (10) Providing quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands. **Value = Twenty (20) points.**

In accordance with GS143-128.2 (d) the undersigned will enter into a formal agreement with the firms listed in the Identification of Small Disadvantaged Business Participation schedule conditional upon execution of a contract with the Owner. Failure to abide by this statutory provision will constitute a breach of the contract. The undersigned hereby certifies that he or she has read the terms of the small disadvantaged business commitment and is authorized to bind the Bidder to the commitment herein set forth.

Date: _____ Approved/Certified By: _____
(Name)

(Title)

(Signature)

State of North Carolina, County of _____
Subscribed and sworn to before me this _____ day of _____ 20__
Notary Public _____
My commission expires _____

SDBE COMPLIANCE PROVISIONS AFFIDAVIT B
INTENT TO PERFORM CONTRACT WITH OWN WORKFORCE

Affidavit of _____
(Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the project contract:
WATER MAIN REHABILITATION

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform **all elements of the work** on this project with his/her own current work forces; and will complete all elements of this project **without** the use of subcontractors, material suppliers or providers of professional services.

The Bidder agrees to provide any additional information or documentation requested by the Owner in support of the above statement.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date: _____ Approved/Certified By: _____
(Name)

(Title)

(Signature)

State of North Carolina, County of _____
Subscribed and sworn to before me this ____ day of ____ 20__
Notary Public _____
My commission expires _____

SDBE COMPLIANCE PROVISIONS AFFIDAVIT C
PORTION OF THE WORK TO BE PERFORMED BY SMALL DISADVANTAGED FIRMS

If the portion of the work to be executed by small disadvantaged businesses as defined in G.S. 143-128.2(g) is equal to or greater than 10% of the Bidders total contract price, then the Bidder must complete this affidavit. This affidavit shall be provided by the apparent lowest responsible, responsive Bidder **within 72 hours** after notification of being low Bidder.

Affidavit of _____ I do certify that on the _____
 (Name of Company)

(Project Number) _____ (Dollar Amount of Bid) _____

I will expend a minimum of _____ % of the total dollar amount of the contract with small disadvantaged business enterprises. SDBE's will be employed as subcontractor, vendors, or providers of professional services. Such work will be subcontracted to the following firms listed below.

Name, Address and Phone No.	*SDBE Category	Description	Dollar Value	% of Contract

*SDBE categories: Black-African Americans (B), Hispanic-Americans (H), Asian- Americans (A), Native-Americans (I), Women (F), Socially/Economically Disadvantaged (D)

Pursuant to G.S. 143-128.2(d), the undersigned will enter into a formal agreement with small disadvantaged firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the Bidder to the commitment herein set forth.

Date: _____ Approved/Certified By: _____
 (Name)

 (Title)

 (Signature)

State of North Carolina, County of _____
 Subscribed and sworn to before me this ____ day of ____ 20__
 Notary Public _____
 My commission expires _____

SDBE COMPLIANCE PROVISIONS AFFIDAVIT D
GOOD FAITH EFFORTS

If the goal of 10% participation by small disadvantaged businesses is **not** achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts.

Name,Address and Phone No.	*SDBE Category	Description	Dollar Value	% of Contract

*SDBE categories: Black-African Americans (B), Hispanic-Americans (H), Asian- Americans (A), Native-Americans (I), Women (F), Socially/Economically Disadvantaged (D)

Documentation of the Bidder’s good faith efforts to meet the goals set forth in these provisions. Examples of documentation shall include the following evidence:

- A. Copies of solicitations for quotes to small disadvantaged business firms. Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.
- B. Copies of quotes or responses received from each firm responding to the solicitation.
- C. A telephone log of follow-up calls to each firm sent a solicitation.
- D. For subcontracts where a small disadvantaged business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.
- E. Documentation of any contacts or correspondence to small disadvantaged businesses, community or contractor organizations in an attempt to meet the goal.
- F. Copy of pre-bid roster.
- G. Letter documenting efforts to provide assistance in obtaining required bonding or insurance for small disadvantaged businesses.
- H. Letter detailing reasons for rejection of a small disadvantaged business due to lack of qualification.
- I. Letter documenting proposed assistance offered to small disadvantaged businesses in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to the next lowest responsible and responsive Bidder.

Date: _____ Approved/Certified By: _____
(Name)

(Title)

(Signature)

State of North Carolina, County of _____
 Subscribed and sworn to before me this ____ day of ____ 20__
 Notary Public _____
 My commission expires _____

SDBE COMPLIANCE PROVISIONS AFFIDAVIT E
SDBE DOCUMENTATION FOR CONTRACT PAYMENTS

Prime Contractor: _____
 Address & Phone: _____
 Project Name: _____
 Pay Application #: _____ Period: _____

The following is a list of payments to be made to small disadvantaged business contractors on this project for the above-mentioned period.

Firm Name and Address	*SDBE Category	Payment Amount	Owner Use Only

*SDBE categories: Black-African Americans (B), Hispanic-Americans (H), Asian- Americans (A), Native-Americans (I), Women (F), Socially/Economically Disadvantaged (D)

Date: _____ Approved/Certified By: _____
 (Name)

 (Title)

 (Signature)

****THIS DOCUMENT MUST BE SUBMITTED WITH EACH PAY REQUEST & FINAL PAYMENT****