STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J.R. "JOEY" HOPKINS
SECRETARY

December 11, 2024

Addendum No. 3
RE: Contract # C204988
WBS # 39001.3.2
STATE FUNDED
Cumberland County (U-3422A)
SR-1003 (CAMDEN RD) FROM PROPOSED FAYETTEVILLE OUTER LOOP TO WEST OF SR-1112 (ROCKFISH RD).

December 17, 2024 Letting

To Whom It May Concern:

Reference is made to the proposal furnished to you on this project.

The following revisions have been made to the proposal.

Page No.	Revision
Proposal Cover	Note added that reads "Includes Addendum No. 3 Dated 12-11-2024".
UC-27 thru UC-28	The Utilities Unit Project Special Provisions have been revised. Section amending **Page 15-4, Sub-article 1505-3 (D) Pipe Laying** revised. Fourth paragraph starting with "For Water Pipe…." has been revised. Fifth paragraph starting with "Gravity flow sewer pipe…" has been revised.
UC-41 thru UC-57	The Utilities Unit Project Special Provisions have been revised. Section amending **Page 15-13, Sub-article 1520-3 (B) (1) Installation** revised. New paragraph added after third sentence that states"Add the following sentences:".

Please void the above listed Pages in your proposal and staple the revised Pages thereto.

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
CONTRACT STANDARDS AND DEVELOPMENT
1591 MAIL SERVICE CENTER
RALEIGH, NC 27699-1591

Telephone: (919) 707-6900
Fax: (919) 250-4127
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
1020 BIRCH RIDGE DR.
RALEIGH, NC 27610

The contract will be prepared accordingly.

Sincerely,

Signed by:
Ronald E. Davenport, Jr.
52C46046381F443...

Ronald E. Davenport, Jr., PE
State Contract Officer

RED/cms
Attachments

cc: Mr. Wiley W. Jones III, PE
Mr. Wallace "Lee" Jernigan, Jr., PE
Mr. Ken Kennedy, PE
Mr. Malcolm Bell
Mr. Forrest Dungan, PE
Ms. Jaci Kincaid
Mr. Jon Weathersbee, PE
Project File (2)

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH, N.C.

PROPOSAL

INCLUDES ADDENDUM No. 3 DATED 12-11-2024

DATE AND TIME OF BID OPENING: **Dec 17, 2024 AT 02:00 PM**

CONTRACT ID	C204988
WBS	39001.3.2

FEDERAL-AID NO.	STATE FUNDED
COUNTY	CUMBERLAND
T.I.P NO.	U-3422A
MILES	1.622
ROUTE NO.	SR-1003
LOCATION	SR-1003 (CAMDEN RD) FROM PROPOSED FAYETTEVILLE OUTER LOOP TO WEST OF SR-1112 (ROCKFISH RD).
TYPE OF WORK	GRADING, DRAINAGE, PAVING, SIGNALS, AND WALLS.

NOTICE:

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS $30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOTWITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY FEDERAL - AID FUNDED PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING.

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A ROADWAY & STRUCTURE PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

process shall be repeated. The cost of the system disinfection and disposal of the chlorinated water shall be included in the appropriate measurement and payment item.

SECTION 1505-EXCAVATION, TRENCHING, PIPE LAYING AND BACKFILLING FOR UTILITIES

Page 15-4, ARTICLE 1505-3 CONSTRUCTION METHODS

Page 15-4, Sub-article 1505-3 (C) Bedding

Add the following paragraph:

Gravity Flow Sewer Pipe:

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

Crushed stone bedding material shall be placed a minimum of four (4) inches deep and a maximum of six (6) inches deep 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 6 inch 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 stone bedding material (No. 57 or No. 5 stone).

Page 15-4, Sub-article 1505-3 (D) Pipe Laying

Add the following paragraphs:

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**.**

All pipes shall be installed in accordance with the approved plans and cut sheets**.**

For water pipe and sewer force main, installation shall be in accordance with the pipe manufacturer’s instructions. Mechanical equipment may be used, but solely relying on using an excavator to home the pipe will not be allowed. Equipment can be used to assist the pipe layer and pipe bar.

Gravity flow sewer pipe shall be laid upgraded, beginning at the lower end with the tongue or spigot ends pointing in the direction of the flow to the correct line and grade. The sewer pipe

section to be installed shall be aligned by batter board or laser beam with the last installed pipe section. 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 the Department. Mechanical equipment may be used, but solely relying on using an excavator to home the pipe will not be allowed. Equipment can be used to assist the pipe layer and pipe bar.

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

No pipe shall be laid in water or where trench conditions are unsuitable. Every precaution shall be taken to prevent material from entering the pipe while it is being installed.

Page 15-4, Sub-article 1505-3 (E) Thrust Restraint third paragraph

Replace third paragraph with the following:

At locations where restrained joints are shown on the plans, use ductile iron pipe and fittings with push-on factory restrained joints. The pipe, joints, and gaskets shall be in accordance with ANSI/AWWA Standards as previously specified for ductile iron pipe in Sub-article 1036-5, Restrained joints, fittings and valves shall be rated for a working pressure of 350 psi for sizes 4-through 24 inch and 250 psi for larger sizes. All factory restrained joint pipe, valves, and fittings shall have restraints internal to the pipe (i.e., "boltless"). The use of mechanical restraints is not allowed. All valves, pipes, and fittings shall be compatible with the factory restraint system. All push-on factory restrained joint ductile iron pipe, and fittings shall be as manufactured by U.S. Pipe's TR-Flex, Griffin Pipe Products SNAP-LOK, American Cast Iron Pipe Company's Flex-Ring Joint, or approved equal.

Special accessories such as mechanical joint retainer glands or field locking gaskets are acceptable on pipes 4 to 12 inch in diameter. Use concrete reaction blocking and thrust collars only where joint restraint is impractical.

Concrete thrust blocking shall be used on all PVC water mains unless shown otherwise on the plans. When thrust blocking is to be used, backfilling shall not occur until the concrete has time to set. No hydrostatic pressure testing shall occur until the concrete thrust blocking has cured for a minimum of five (5) calendar days.

Page 15-4, Sub-article 1505-3 (F) Backfilling

Add the following paragraph:
Compaction

Backfill shall be compacted in accordance with the following table as a percentage of the maximum density at optimum moisture content as determined by the Standard Proctor Test, ASTM D-698.

PART 54. 33	**PART 55.** 31:10	**PART 56.** 72	**PART 57.** 25.852L
PART 58. 36	**PART 59.** 34:00	**PART 60.** 66	**PART 61.** 30.768L

Page 15-12, Sub-article 1520-3(A)(2)(d) Visual Inspection:

Add the following after line 29:

Visually inspect all installed gravity sewer lines and the gravity sewer lines repaired or reconnected to existing and or new manholes from the inside using approved cameras.

Page 15-13, Sub-article 1520-3 (B) (1) Installation

Replace paragraph 2 (Line 19) with the following:

All sewer force mains shall have automatic combination air release vacuum valves installed at all high points, as indicated on the plans, and as specified herein.

Add the following sentences:

The existing force main is active. The new force main will be installed from valve to valve as shown on the plans. Provide the Engineer seven days notice before beginning work to tie in, in order to coordinate with PWC to shut down the force main while lines are cut at both ends and tied in with the long sleeves.

Maintain sewer flow at all times. Use temporary diversions or pumping to maintain flow when connecting proposed sewers to existing sewers. Use engineered temporary pumping systems capable of handling full pipe flow. Use pumping systems with automatic reliable operation or constantly tended manual operation. By-pass pumping assemblies shall be installed in accordance with these Special Provisions.

All pipes shall be installed to the required lines and grades. Structures shall be installed at the design locations. The alignment of the pipe will generally be indicated by stakes parallel to the line of the pipe. The grades of the pipe will be provided by cut sheets that coincide with the provided staking. Grades shall not be provided on the survey staking. The Contractor shall be responsible for installing the pipe to proper line and grade.

Threaded PVC and cemented joints will not be permitted. The ends of push on joints shall be beveled to facilitate assembly. The pipe shall be marked by the manufacturer to indicate when the pipe is fully seated, and the gasket lubricated to prevent displacement. Care shall be exercised to ensure that the gasket remains in the proper position in the bell or coupling.

All pipe installations shall be properly restrained, using either thrust blocks or approved restraint systems. The thrust blocking shall be in accordance with the drawings. The approved restraint system shall be installed in accordance with the manufacturer’s instructions.

Page 15-13, Sub-article 1520-3 (B) (2) Testing

Add the following sentences:

Where any section of a force main is provided with concrete thrust blocking for fittings, the hydrostatic test shall not be made until at least five (5) days after installation of the blocking unless otherwise approved. PWC's representative shall be present for all testing. Properly dispose of the test water from the system. If blow offs are not available at the high places, taps shall be made to provide blow offs.

Page 15-13, Add Sub-article 1520-3 (C) Additional Bypass Pumping Requirements:

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 Department. 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 demonstrate that he, or his designated subcontractor, has experience in the design, installation, and maintenance of temporary bypass pumping systems.

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 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 PWC and the Department.

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 and the public. The Contractor shall identify the proposed methods to protect the temporary bypass pumping system from traffic and the public as part of the detailed temporary bypass pumping plan. Traffic control shall be performed in accordance with the Department's traffic control plan and measures.

The bypass pumping system shall be monitored by Contractor personnel at all times (24 hours a day, 7 days a week), when the bypass operation is in effect. The Contractor's personnel shall be on-site at all times (24 hours a day, 7 days a week), and stationed at the primary bypass pumps. Depending on the location and system set-up, it may be necessary for the Contractor to station personnel at each of the various bypass pump locations. Unless otherwise approved by the Fayetteville Public Works Commission, one (1) person cannot monitor multiple bypass pump locations. All bypass pumps, regardless of their location (primary or on secondary lines), shall be equipped with an automatic dialer (or other similar device). The Contractor personnel shall immediately respond to any issue regarding the temporary bypass pumping system. All temporary bypass piping shall be periodically monitored (patrolled from pumps to discharge), but no less frequently than once every 12 hours. The bypass pumping equipment shall be automated and capable of functioning without the assistance of an operator.

Submittals

The Contractor shall submit a detailed bypass pumping plan for approval, prior to initiating the bypass operation.

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

(1) Method of monitoring the pumps to ensure proper operation, to include method of notifying personnel (PWC and Contractor) in the event of an emergency, activation of back-up pumps, etc.
(2) Method of monitoring upstream system levels to ensure surcharging does not result in back-ups into buildings, overflows, etc.
(3) The amount, if any, of any required surcharging.
(4) Method to initiate back-up pumps.
(5) Map showing general location of the pumps and bypass lines. This shall include means to maintain access to driveways, etc.
(6) Measures to secure the bypass system (lines, pumps, etc.) from traffic, vandalism, high stream flows, etc.
(7) Method of plugging (and securing the plug(s)) and type of plugs.
(8) Size and location of manholes or other access points for suction and discharge piping.
(9) Size of pipeline(s) or conveyance system(s) to be bypassed.
(10) Number, size, material, location, and method of installation of suction piping.
(11) Number, size, material, location, and method of installation of discharge piping.
(12) Bypass pump sizes, capacities, and number of each size to be provided on-site, including all primary, secondary, and spare pumping units.
(13) 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.
(14) Measures to protect discharge manhole(s) or structure(s) from erosion and damage due to the bypass operation.
(15) Erosion control measures.
(16) Emergency contact information for the personnel responsible for the pump operation.
(17) Emergency contact information for Contractor personnel to respond in the event of an emergency.

(18) List of available resources (equipment, materials, personnel) and contact information for emergency response.
(19) Method to contain potential releases of sewer flow from combination air release valves.
(20) 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.

Coordination:

The Contractor shall fully coordinate their temporary bypass pumping operations with PWC. It is the Contractor's responsibility to fully determine the scope and location of the temporary bypass pumping system. All coordination (including 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 PWC and other personnel (Department, 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 PWC has confidence that the appropriate personnel can operate and maintain the temporary bypass pumping system. Should, for any reason, the Department and/or 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 PWC. Upon completion of those actions, another coordination meeting shall be held, in order for 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 Department and PWC are 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 PWC, prior to any activity occurring within the main(s) being bypassed.

Flow Control Processes:

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 of 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 PWC. 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.

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 throughout the duration of the work. Flows shall be bypassed in accordance with the approved temporary bypass pumping plan. Upon acceptance of the work by PWC, 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:

(1) 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.
(2) 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.
(3) All equipment (primary and secondary pumps) shall be equipped in a manner to keep noise to a maximum of 65 dBA at 30 feet.

(4) An automatic dialer (or similar) to immediately notify (in a sequential operation) Contractor and PWC 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. All bypass pumps (regardless of location) shall be equipped with an automatic dialer (or similar).

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 (24 hours a day, 7 days a week) monitored by on-site 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 (in a sequential operation) the Contractor and PWC in the event of equipment failure. All bypass pumps (regardless of location) shall be equipped with an automatic dialer. This automatic dialer (or similar) shall be set to issue notifications prior to flow levels reaching critical elevations and having a spill occur.

The automatic dialer shall be set to issue notifications through a sequential operation. Automatic dialers that are not set up for sequential notifications shall not be acceptable. The Contractor's personnel shall be the first to receive any notifications from the automatic dialer. The automatic dialer shall only notify the PWC personnel after all Contractor notifications have been ignored and/or not responded to. The Contractor shall properly adjust the level at which the automatic dialer initiates notification to provide adequate time for the sequential notification to occur. If the PWC personnel are notified by the automatic dialer, the PWC personnel shall assume that a spill is occurring or is imminent and respond accordingly. The Contractor shall be responsible for all costs for the PWC to mobilize and respond to the notification, regardless of if a spill occurred or not.

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 PWC. Testing shall be coordinated with PWC a minimum of 48 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 PWC's Construction Department, (910) 223-4716, PWC Project Coordinator & the Department. 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 (NCDEQ).

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 Department and/or Fayetteville Public Works Commission. The Contractor is also responsible for complying with any and all regulatory requirements in regard to the size spill with no additional cost to the Department and/or 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. The Contractor is responsible bearing all costs associated with the cleanup of a spill caused by the Contractor's operations.

Where sewage has been returned up into property due to any aspect of the Contractor's operation, the Contractor shall immediately notify PWC, and the Department inspect the property with the Department and PWC 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 damage, occupant accommodation, 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.

Page 15-13, Sub-article 1520-4, Measurement and Payment

Add the following paragraphs to each respective item:

For Sanitary Gravity Sewer, removal, and disposal of existing main shall be incidental to the installation of the new pipe and no separate payment will be made.

Sewer Service Line will be paid per linear foot and by size (four (4) inch or six (6) inch). All fittings will be incidental to Sewer Service Line. Removal and disposal of existing sewer service lateral shall be incidental to the installation of the new sewer service lateral and no separate payment will be made.

1525-UTILITY MANHOLES

Page 15-14, ARTICLE 1525-2 MATERIALS

Add the following sentences to the end of the section paragraph (Line 20):

The frame and cover shall be manufactured by the same manufacturer. Any defective casting shall be removed and replaced.

In unpaved areas, cam-lock ring and cover shall be used. Camlock bolt head shall be compatible with the required tool for turning camlock mechanism. The contractor shall provide one tool to open the cam locks at the end of the project. Camlock ring and covers shall be installed as indicated on the drawings.

Page 15-14, Add Sub-article 1525-2 (A) Precast Concrete Sanitary Sewer Manholes

All manholes shall be constructed to these Special Provisions. Installation shall be in accordance with ASTM C-891 and these Special Provisions. An eccentric cone shall be utilized on all manholes.

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

All reinforced concrete precast manholes shall include a liquid anti-microbial admixture to render the concrete uninhabitable for bacterial growth. The admixture shall be included in the fabrication of the manhole by an approved concrete precast manhole manufacturer. Coatings applied to the interior walls of the manhole shall not be acceptable. A color identifier shall be applied to the interior of each concrete piece fabricated with the anti-microbial admixture. Each piece shall also be plainly stenciled with the name of the anti-microbial admixture on the exterior of each.

Further, all field mixed mortar, utilized in concrete precast manholes, shall include the same anti-microbial admixture. Any defects shall be the cause for the replacement and correction of such defect, at no additional expense.

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 coating's specification and the manufacturer's specifications for that material.

Page 15-14, Add Sub-article 1525-2 (B) Special Coatings, Anti-Microbial Admixture

The anti-microbial admixture shall be ConShield, ConBlock, or approved equal. The ConShield liquid anti-microbial admixture can be obtained from ConShield Technologies, Inc. or an approved precast facility. TheConBlock liquid anti-microbial admixture can be obtained from ConSeal Concrete Sealants, Inc., or an approved precast facility.

Product data, certifications, and product data, to include the following:

1. U.S. Environmental Protection Agency (EPA) registration number.

2. Documentation that the product has a minimum of 10 years of successful prevention of microbial induced corrosion in sanitary sewers.

3. Documentation that the precast facility is certified by the anti-microbial manufacturer.

4. Documentation from the precast facility stating that the correct amount and correct mixing procedure was followed for all anti-microbial concrete.

The liquid anti-microbial admixture shall be used in accordance with the manufacturer's recommendations. The amount of the admixture shall be included in the total water content of the concrete or mortar mix design. The admixture shall be added to the concrete or mortar mix water, to ensure even distribution of the admixture throughout the concrete or mortar mix. When properly prepared, the anti-microbial admixture shall render the concrete or mortar uninhabitable for bacterial growth.

The cost of the admixture shall be included in the fabrication of all sewer manhole sections.

Page 15-14, Add Sub-article 1525-2 (C) Sanitary Sewer Manhole Vents

Sewer manhole vent shall be fabricated from three (3) inch Schedule 40 aluminum pipe. Vent shall be threaded into manhole lid. Manhole lid shall be drilled and tapped to accommodate three (3) inch diameter threaded pipe. Minimum height shall be four (4) feet to crest of vent. Vent shall extend to two (2) feet above the 100-year flood elevation where manholes are located in a FEMA flood hazard zone. Vent opening shall be protected with stainless-steel screen. Vents shall be placed every 1,000 feet.

Page 15-14, Sub-article 1525-2, Materials

Page 15-14, Add Sub-article 1525-2 (D) Fittings and Connections

Pipe connections to a manhole shall be by gasketed flexible watertight connections.

A watertight, flexible pipe-to-manhole connector shall be used on all pipe to manhole connections, for both new and existing manholes and pipes.

The internal expansion sleeve shall be comprised of Series 300 non-magnetic stainless-steel. The external compression take-up clamps shall also be Series 300 non-magnetic stainless-steel. No welds shall be utilized in the sleeve and clamp construction.

Page 15-15 ARTICLE 1525-3 CONSTRUCTION METHODS

Page 15-15, Line 1, Replace paragraph with:

Provide an inside drop assembly on manholes for sewer pipes entering with 2.5 feet or more vertical drop. Inside drop assemblies shall be used for connections to existing manholes when the drop exceeds 2.5 feet. New installation, the manhole diameter shall be 5 feet or larger. Provide a pipe slide where vertical separation between inverts is less than 2.5 feet.

Page 15-15, Line 4, Replace paragraph with:

In all sewer manholes, provide steps spaced 16 inches on center. Install steps in line with the effluent opening unless otherwise specified.

Page 15-15, Line 6, Replace paragraph with:

The manhole invert shall be constructed of brick and mortar. 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 the 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 1% 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). When connecting to an existing manhole, the bottom of the boot for the new sewer main or lateral shall be set 1 inch above existing shelf unless otherwise indicated.

Page 15-15, Line 12, Replace Table 1525-1 with:

TABLE 1525-1
MANHOLE CONSTRUCTION

Location	Top height above finished grade	Ring and Cover Type
Roadway pavement, Driveways, Sidewalks, Parking lots	Flush ± ¼" with concrete collar	Standard Traffic Area Manhole Ring and Cover (H-20 Rated)
Vehicle Recovery Area	Flush ± 3"	Standard Traffic Area Manhole Ring and Cover with Wiper Gasket and Cam Lock
Manicured Areas	Flush to +2"	Standard non-Traffic Area Manhole Ring and Cover with Wiper Gasket and Cam Lock
Flood Zones less than 3 ft above finished grade	Minimum 18" Above Ground with Vent Extending to 2 feet above 100-year Flood Elevation	Standard non-Traffic Area Manhole Ring and Cover with Wiper Gasket and Cam Lock
Flood Zones greater than 3 ft above finished grade	Minimum 18" Above Ground with Vent Extending to 2 feet above 100-year Flood Elevation	Standard non-Traffic Area Manhole Ring and Cover with Wiper Gasket and Cam Lock
Outfall Areas outside of Flood Zones	Minimum 18" Above Ground	Standard non-Traffic Area Manhole Ring and Cover with Wiper Gasket and Cam Lock

Add additional provisions:

The manhole size shall be in accordance with the following table, unless otherwise specified:

Pipe Size (inches)	Manhole Diameter (inches)**
24 and less	48
27 to 36	60*
42	72

*Where one main line or multiple lateral interiors drop structures are required, use 60 inch diameter.

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

Page 15-15, Sub-article 1525-3 (B), Installation of Precast Units

Add the following paragraph:

All exterior manhole section joints 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.

Page 15-15, Sub-article 1525-3 (C) Fittings and Connections

Page 15-15, Line 33-Add the following after the last paragraph:

Installation of the connector shall be performed using 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 installed in accordance with the manufacturer's instructions.

The Contractor shall use 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.

Page 15-16, Sub-article 1525-3 (D) Testing

Add the following:

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 PWC. Provide all the necessary labor, materials, equipment, testing apparatus, and all other incidentals necessary

to complete the vacuum test. All testing equipment used 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. 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

Diameter of Manhole			
Manhole Depth	**4' Diameter**	**5' Diameter**	**6' Diameter**
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**

or exceeds the values indicated below:

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 connecters 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 (feet)*	**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 prior to being used. Retesting shall be performed until a satisfactory test is accomplished.

SECTION 1530 -ABANDON OR REMOVE UTILITIES

Page 15-16, ARTICLE 1530-3 CONSTRUCTION METHODS

Page 15-16, Sub-article 1530-3 (A) Abandoning Pipe

Add the following paragraphs:

Perform kill-outs of existing mains to be abandoned as designated on the Drawings. Kill-outs shall consist of the following requirements.

(1) Kill out shall be done a minimum of five (5) feet from any fitting on the existing water main that is to remain in service.
(2) Ductile iron pipe stiff knee shall be four (4) inch diameter for mains 12 inches or less. Utilize eight (8) inch ductile iron pipe or larger for mains larger than 12 inches. Minimum length of five (5) feet of stiff knee shall be provided. Stiff knee shall be encased in concrete. Concrete shall cover the abandoned pipe, but it shall not come in contact with the active water main or any fittings on the active water main. Place blocks rated as the same compressive strength as the concrete under the stiff knee to provide support during concrete placement.
(3) On the active water main side of the stiff knee, provide full body mechanical joint sleeve with restraining gland and restraining plug or cap.
(4) On the abandoned water main side, provide minimum one-quarter (¼) inch steel plate or ductile iron cap or plug.
(5) Coordinate outages with PWC and other work to minimize the number of planned outages.
(6) Abandoned pipe shall be grout filled or removed in accordance with Section 1530.

Remove valves, or close valves and remove the top of the valve box to an elevation two (2) feet below the roadway subgrade or finished grade and backfill.

Page 15-17, ARTICLE 1530-4 MEASUREMENT AND PAYMENT

Add the following sentence to the first paragraph:

Kill out of existing water mains to be abandoned shall be incidental to the other work and will not be measured and paid.

SECTION 1540-ENCASEMENT

Page 15-18, ARTICLE 1540-2 MATERIALS

Page 15-18 Add Sub-Article 1540-2 (A) Encasements for Railroad Crossings

The Contractor may substitute larger size casing pipe (particularly for sewer mains where grade and alignment are critical) with the proper wall thickness. All additional costs shall be included in the cost of the encasement. Furthermore, the Contractor will be responsible for all engineering costs to update the 100-year design service life for the larger encasement at their expense.

Page 15-18 Add Sub-Article 1540-2 (A) Encasements for Water and Sewer Mains

The material for the gravity sanitary sewer carrier pipe shall be CL 50 ductile restrained joint pipe iron or C-900 PVC (DR 18) for all pipe 4 to 12 inch diameter. All sanitary sewer ductile iron carrier pipe shall have specified lining and coating. Use of restraining gaskets (i.e., field-lock gaskets) is an acceptable means of restraint for gravity sewer mains. Use of iron MJ retaining glands are not approved for restraint within casings.

All ductile iron pressure pipes (4 to 12 inch diameter) within casings shall be factory restrained, in accordance with these specifications and as indicated on the drawings. The use of mechanical restraints shall not be used on pipe within casings for pressure pipe.

Add the following paragraphs for specifying the carrier pipe brace or spider assembly for ductile iron carrier pipes:

Provide carbon steel carrier pipe brace with the band being made from 12-gauge minimum thickness with 4 inch width and riser being made from eight (8) gauge minimum thickness. Runners shall be minimum 2 inches wide.

Add the following paragraphs for specifying the carrier pipe brace or spider assembly for 8 inch C900 PVC carrier pipe.

Provide carbon steel carrier pipe brace with the band being made from fourteen (14) gauge minimum thickness with 8 inch width and riser being made from fourteen (14) gauge minimum thickness. Runners shall be minimum two (2) inch width with UHMW Polymer coasting. Legs shall be minimum fourteen (14) gauge thickness with six (6) inch width.

Page 15-18, ARTICLE 1540-3 CONSTRUCTION METHODS

Page 15-18, Sub-article 1540-3. (C) Encasements for Future Use

Add the following paragraph:

Mark encasements for future use with a manufactured three (3) sided fiberglass utility marker

(color green for sewer and blue for water). Marker shall be anchored in the ground using U-channel Post minimum of two (2) feet in depth. Place a marker at the right of way or at the ends of the encasements if encasements extend beyond the right of way.

Page 15-18, Sub-article 1540-3 (D), Carrier Pipe Installation

Add the following sentences to the first paragraph for ductile iron carrier pipes:

Minimum spacing for carrier pipe brace or spider assemblies shall be at 3 feet prior to and 3 feet after each joint of ductile iron carrier pipe. Fasten brace or spider to pipe with heavy duty studs, nuts, and washers.

SECTION 1550-TRENCHLESS INSTALLATION OF UTILITIES

Page 15-20, ARTICLE 1550-3 CONSTRUCTION METHODS

Page 15-20, Sub-article 1550-3 (B) Design

Add the following sentences to the last paragraph:

For boring and tunneling operations, the certified calculations shall include a geotechnical analysis to confirm the selected method will not result in road settlement or upheaval, a road movement monitoring plan and remediation plan should the work result in settlement or upheaval. For drilling operations, appropriate calculations shall be provided to evaluate hydraulic fracturing and to develop a Fraction Mitigation Contingency Plan.

Page 15-20, ARTICLE 1550-4 MEASUREMENT AND PAYMENT

Page 15-20, Sub-article 1550-4 (A) Bore and Jack

Add the following paragraphs:

Locate all existing utilities in the proposed location of the jack and bore.

Pilot Tube Guided Auger Bore and Jack

The Pilot Tube Guided Auger Bore and Jack system shall utilize a two or three phase system as described below:

1) **Three Pass System**
   A. Phase 1 - A rigid steel pilot tube approximately one-meter in length shall be installed through the ground from the drive shaft to the receiver shaft by earth displacement with the jacking frame. The alignment of the pilot tube shall be established with a theodolite mounted at the rear of the drive shaft and accurately set to the desired line and grade. The theodolite shall view a lighted target in the lead or steering pilot tube. A camera shall be fitted to the theodolite and shall transmit the image of the crosshair and the target onto a monitor screen to be viewed in the drive shaft by the operator. As the operator advances the pilot tube through the earth the center of the target will drift from the crosshair as a result of the biased or slanted leading tip of the pilot tube. The operator shall rotate the pilot tube as required to orient the slanted steering tip toward the crosshair and continue to advance the pilot tube until it reaches the receiver shaft.

B. Phase 2 -An enlargement casing with an outside diameter up to one and a half (1 ½) inches larger than the product pipe shall be rigidly connected to the final pilot tube and advanced into the earth behind the pilot tube. An auger shall be used inside the enlargement casing to remove the material being excavated. The auger shall be contained inside the limits of the enlargement casing as it progresses along the proposed alignment. A train of temporary steel casings with an outside diameter very similar to the enlargement casing and used to move the enlargement casing from the drive shaft to the receiver shaft. The enlargement casing will cut a bore hole from the drive shaft to the receiver shaft and the temporary casings will case the hole as it is cut. Each temporary casing shall be fitted with an internal auger to transport the excavated material to the drive shaft where it shall be removed from the shaft and disposed of at an approved location. The pilot tubes shall be recovered in the receiver shaft as the temporary casings are installed.

C. Phase 3-The product pipe shall then be installed directly behind the final temporary casing pipe with the jacking frame. The casing pipes and augers shall be recovered in the receiver shaft as the product pipe is installed.

2) Two Pass System

A. Phase 1 - The pilot tube shall be installed in the same manner described in Phase 1 of the Three Pass System.

B. Phase 2 - The enlargement casing shall be installed in the same manner described in Phase 2 of the Three-Phase System. Each product pipe shall be fitted with an internal protective-casing pipe to house the auger and prevent damage to the product pipe. The product pipe shall be installed directly behind the enlargement casing with the internal casing rigidly connected to the auger chamber of the enlargement casing. The internal casing shall be manufactured such that the excavated material does not leak excessively into the product pipe. The internal casing shall be fitted with a protective shoe to protect the product pipe from damage and to support the casing and auger at the centerline of the pipe.

C. Phase 3 - The product pipe shall be advanced along the proposed alignment with the jacking frame thus progressing the enlargement casing from the drive shaft to the receiver shaft with the pilot tubes being recovered in the receiver shaft. The excavated material shall be funneled into and conveyed through the internal casing to the drive shaft where it shall be removed from the shaft and disposed of at an approved location. Upon reaching the receiver shaft the enlargement casing shall be removed and the internal casings and augers retracted and recovered at the drive shaft.

Page 15-21, Sub-article 1550-4 (B), Directional Drilling

Add the following paragraph:

At the horizontal directional drill locations and prior to drilling, remove the upper 18 inches of the bearing soil and place a geotextile (Mirafi 140 N or equivalent) over the entire bearing location. Backfill the excavation with clean, washed, NCDOT #57 stone to the bearing level of the working platform. The thickness of the NCDOT #57 stone should not exceed two feet in thickness before

being compacted with a vibratory plate compactor. Have a qualified geotechnical engineer provide written approval of the working platform bearing grades once final locations are selected and prior to starting the advancement of the directional drills.

Page 15-21, Sub-article 1550-4 (C), Tunneling

Add the following paragraph:

The Contractor shall locate all existing utilities in the proposed location of the jack and bore.

Page 15-21, Sub-article 1550-4 (D), Pipe Ramming

Add the following paragraph:

The Contractor shall locate all existing utilities in the proposed location of the jack and bore.