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BY: \_\_\_\_\_

MSR10 \_\_\_\_\_

(NUMBER TO BE ASSIGNED BY STATE)

APPLICANT IS THE:  OWNER  PRIME CONTRACTOR

### OWNER CONTACT INFORMATION

OWNER CONTACT PERSON: Keith Jones  
OWNER COMPANY LEGAL NAME: IMS Communities  
OWNER STREET OR P.O. BOX: 5690 Watermelon Road  
OWNER CITY: Northport STATE: AL ZIP: 35473  
OWNER PHONE #: (205) 469-1529 OWNER EMAIL: Keith@IMSCommunities.com

### PREPARER CONTACT INFORMATION

IF NOI WAS PREPARED BY SOMEONE OTHER THAN THE APPLICANT

CONTACT PERSON: Eric Morgan  
COMPANY LEGAL NAME: Pape-Dawson Georgia, LLC  
STREET OR P.O. BOX: 2500 Northwinds Parkway, Suite 360  
CITY: Alpharetta STATE: GA ZIP: 30009  
PHONE # ( ) 404-693-1618 EMAIL: Eric.Morgan@pape-dawson.com

### PRIME CONTRACTOR CONTACT INFORMATION

PRIME CONTRACTOR CONTACT PERSON: TBD  
PRIME CONTRACTOR COMPANY LEGAL NAME: \_\_\_\_\_  
PRIME CONTRACTOR STREET OR P.O. BOX: \_\_\_\_\_  
PRIME CONTRACTOR CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_  
PRIME CONTRACTOR PHONE #: ( ) \_\_\_\_\_ PRIME CONTRACTOR EMAIL: \_\_\_\_\_

### FACILITY SITE INFORMATION

FACILITY SITE NAME: Beacon Place - Starkville  
FACILITY SITE ADDRESS (If the physical address is not available, please indicate the nearest named road. For linear projects indicate the beginning of the project and identify all counties the project traverses.)  
STREET: Carter Boulevard  
CITY: STARKVILLE STATE: MS COUNTY: OKTIBBEHA ZIP: 38025  
FACILITY SITE TRIBAL LAND ID (N/A If not applicable): N/A  
LATITUDE: 33 degrees 26 minutes 45 seconds LONGITUDE: 88 degrees 51 minutes 17 seconds  
LAT & LONG DATA SOURCE (GPS (Please GPS Project Entrance/Start Point) or Map Interpolation): GPS  
TOTAL ACREAGE THAT WILL BE DISTURBED <sup>1</sup>: 36.7

IS THIS PART OF A LARGER COMMON PLAN OF DEVELOPMENT?

YES  NO

IF YES, NAME OF LARGER COMMON PLAN OF DEVELOPMENT: \_\_\_\_\_  
AND PERMIT COVERAGE NUMBER: MSR10 \_\_\_\_\_

ESTIMATED CONSTRUCTION PROJECT START DATE: \_\_\_\_\_  
2026-06-01  
YYYY-MM-DD

ESTIMATED CONSTRUCTION PROJECT END DATE: \_\_\_\_\_  
2027-06-01  
YYYY-MM-DD

DESCRIPTION OF CONSTRUCTION ACTIVITY: CONSTRUCT A MULTIFAMILY RESIDENTIAL DEVELOPMENT

PROPOSED DESCRIPTION OF PROPERTY USE AFTER CONSTRUCTION HAS BEEN COMPLETED:  
MULTIFAMILY RESIDENTIAL DEVELOPMENT

SIC Code: \_\_\_\_\_ NAICS Code \_\_\_\_\_

NEAREST NAMED RECEIVING STREAM: JOSEY CREEK

IS RECEIVING STREAM ON MISSISSIPPI'S 303(d) LIST OF IMPAIRED WATER BODIES? (The 303(d) list of impaired waters and TMDL stream segments may be found on MDEQ's web site: [http://www.deq.state.ms.us/MDEQ.nsf/page/TWB\\_Total\\_Maximum\\_Daily\\_Load\\_Section](http://www.deq.state.ms.us/MDEQ.nsf/page/TWB_Total_Maximum_Daily_Load_Section)) YES  NO

HAS A TMDL BEEN ESTABLISHED FOR THE RECEIVING STREAM SEGMENT? YES  NO

FOR WHICH POLLUTANT:

ARE THERE RECREATIONAL STREAMS, PRIVATE/PUBLIC PONDS OR LAKES WITHIN 1/2 MILE DOWNSTREAM OF PROJECT BOUNDARY THAT MAY BE IMPACTED BY THE CONSTRUCTION ACTIVITY? YES  NO

EXISTING DATA DESCRIBING THE SOIL (for linear projects please describe in SWPPP):  
NRCS WEB SOIL SURVEY

WILL FLOCCULANTS BE USED TO TREAT TURBIDITY IN STORM WATER? YES  NO

IF YES, INDICATE THE TYPE OF FLOCCULANT.  ANIONIC POLYACRYLAMIDE (PAM)  
 OTHER \_\_\_\_\_

IF YES, DOES THE SWPPP DESCRIBE THE METHOD OF INTRODUCTION, THE LOCATION OF INTRODUCTION AND THE LOCATION OF WHERE FLOCCULATED MATERIAL WILL SETTLE?

IS A SDS SHEET INCLUDED FOR THE FLOCCULATE? YES  NO

WILL THERE BE A 50 FT BUFFER BETWEEN THE PROJECT DISTURBANCE AND THE WATERS OF THE STATE? YES  NO

IF NOT, PROVIDE EQUIVALENT CONTROL MEASURES IN THE SWPPP.

<sup>1</sup>Acreage for subdivision development includes areas disturbed by construction of roads, utilities and drainage. Additionally, a housesite of at least 10,000 ft<sup>2</sup> per lot (entire lot, if smaller) shall be included in calculating acreage disturbed.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

W. K. Jones  
Signature of Applicant<sup>1</sup> (owner or prime contractor)

5/1/2026  
Date Signed

W. Keith Jones  
Printed Name<sup>1</sup>

Manager  
Title

<sup>1</sup>This application shall be signed as follows:

- For a corporation, by a responsible corporate officer.
- For a partnership, by a general partner.
- For a sole proprietorship, by the proprietor.

For a municipal, state or other public facility, by principal executive officer, mayor, or ranking elected official

Please submit the LCNOI form to:

Chief, Environmental Permits Division  
MS Department of Environmental Quality, Office of Pollution Control  
P.O. Box 2261  
Jackson, Mississippi 39225

Electronically:

<https://www.mdeq.ms.gov/construction-stormwater/>

Revised 3/23/22

## DELIVERY VIA USPS

Date: May 6, 2026

To: Carrie Barefoot, P.E. | Division Chief  
Mississippi Department of Environmental Quality | Land Disturbance Division  
601-961-5249 | CBAREFOOT@mdeq.ms.gov  
515 E. Amite Street, Jackson, MS 39201

From: Austin Darnell | Pape-Dawson | 678-666-1236 | Austin.Darnell@pape-dawson.com

Re: **CONSTRUCTION STORMWATER - INITIAL LCNOI SUBMITTAL:  
BEACON PLACE - STARKVILLE**

Project Name: Beacon Place - Starkville  
Project Type: Multifamily development  
Address: Carter Boulevard, Section 08, Township 18 North, Range 14 East  
Tax Parcel ID: 103J-08-001.00  
Jurisdiction: City of Starkville  
Site Area: 64.7 total acres; 36.7 disturbed acres  
Developer: IMS Development

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Good day Carrie and MDEQ,

On behalf of IMS Development, we are pleased to have submitted the Large Construction Notice of Intent for the above-mentioned development via the MDEQ portal. Per the instructions provided after submitting the documents, we are mailing physical copies of each of the provided documents. Upon review, please let me know if you have any questions or concerns. We appreciate your help and guidance on this project.

Items included with this submittal:

1. Transmittal Letter
2. LCNOI Form
3. Beacon Place - Starkville Civil Site Plans
4. City of Starkville Water & Sewer Specifications

Best regards,

Austin Darnell

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MAY 08 2020  
BY: \_\_\_\_\_

PAPE-DAWSON

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BY: \_\_\_\_\_

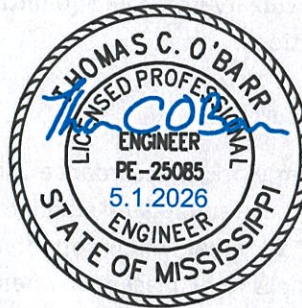
# Beacon Place - Starkville

Project ID: 2025-061

Water and Sewer Specifications

Prepared for IMS Development

May, 2026



**2.02 Material for Pipe Bedding and Foundation**

- A. Select bedding or foundation material shall be in accordance with ASTM C33, gradation 57, commonly known as ASTM #57, with the following gradation requirements:

Sieve Size	Percent Passing
1 ½ inch	100
1 inch	95-100
½ inch	25-60
No. 4	0-10
No. 8	0-5

- B. Alternative bedding materials may be considered at the discretion of the Engineer. Alternate bedding materials shall be crushed rock classified as GP as specified in ASTM D2487 with fifteen (15) percent sand or less, a maximum of 25% passing 3/8-inch sieve, and a maximum of five (5) percent fines.

**2.03 Borrow Material for Pipe Embedment**

- A. Borrow material shall be composed of a natural or manufactured mixture of sand, silt, and clay or combinations of sand, silt, clay, gravel, or stone. The materials shall be free from rocks larger than three (3) inches, roots and other organic matter, ashes, cinders, trash, debris, and other deleterious materials. Borrow material shall be such that when properly compacted will form a dense mass.
- B. The following material classifications, or combination thereof, as specified in ASTM D2487 shall be used as borrow material: GW, GP, GM, SW, SP, and SM.
- C. Material meeting the gradation requirements for fine aggregate as specified in ASTM C33 will be allowed at the discretion of the Engineer.

**2.04 Excess Excavation**

- A. Excess excavation will consist of excavation that cannot be satisfactorily incorporated into the Work.
- B. Such material may include any type, kind, or class of excavation which the Engineer, Owner, or his authorized representative determines must be removed from the right-of-way or project site, including such material displaced from the installation of new utility lines (water, sewer, etc.) and structures (manholes, etc.).

**PART 3 – EXECUTION**

**3.01 General**

- A. Excavated materials not suitable for backfill or embankment shall not be incorporated into the project but shall be disposed of by the Contractor in a manner approved by applicable governmental regulations.
- B. Work shall conform to the widths and depths as shown on the plans and as authorized by the Engineer.

**4.02 Payment**

- A. The prices thus bid shall be full compensation for completing the work specified. Materials or work for which a pay item is not included and are necessary to complete the work under this section shall be furnished or performed and shall be considered incidental to the completed construction.
- B. Payment shall be made in accordance with the following Pay Item No.:

02221-A	Select Bedding Material	per cubic yard
02221-B	Select Borrow Material	per cubic yard
02221-C	Excess Excavation	per cubic yard

**END OF SECTION**

### **1.03 Submittals**

- A. Product Data: Submit manufacturer information regarding pipe materials, pipe fittings, hydrants, valves, accessories, and pipe bedding and backfill material.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

### **1.04 Quality Assurance**

- A. Perform work in accordance with Starkville Utilities, City of Starkville, and other applicable local, state, and federal standards and requirements.
- B. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- C. Schedule and conduct work in a manner which will minimize inconvenience to vehicular and pedestrian traffic. Provide flaggers, barricades, warning signs, warning lights, and other warning means as appropriate. Maintain traffic on all roads and streets which must be crossed by trenching by making two separate cuts so that at least one traffic lane is open at all times. All traffic control devices used during construction must conform to Part 6 of the Manual on Uniform Traffic Control Devices, latest edition.

### **1.05 Miscellaneous Requirements**

- A. In instances where the distribution mains cross state highways or railroad, the water mains shall be installed per requirements of the Mississippi Department of Transportation or railroad. Construction shall be in accordance with an approved permit.
- B. The engineer or developer shall obtain all necessary permits, and the contractor is responsible for coordinating the crossing with the permit grantor.
- C. Trenches shall be constructed so as not to harm any shade trees, shrubs, or flower beds near residences, or any other item called to special attention. All stumps and roots encountered in the trench shall be cut back enough so that in no instance shall they come in contact with the pipe. Suitable fill material shall be added to the trench to cushion the pipe in instances where roots or large stone, etc. cannot be removed. All clean-up is the responsibility of the contractor.

## **PART 2 – PRODUCTS**

### **2.01 General**

- A. All furnished materials shall be new and accompanied by a manufacturer's certificate that his product meets these applicable specifications.

### **2.02 Polyvinyl Chloride (PVC) Pipe**

- A. Solid wall polyvinyl chloride (PVC) pipe 4" and larger shall be blue in color, Class 235 (DR18) and manufactured in accordance with AWWA C900 (latest edition), conforming to ASTM D1784, NSF approved, and be U.L. listed.

appropriate for the connection. Mechanical joints shall be recommended by the manufacturer for use with AWWA C900 PVC or ductile iron pipe and shall be furnished with MJ retainer glands.

- a. Where depth of valve is too great for operation by standard wrench, provide suitable, permanently installed valve stem extension and guide.
2. Provide gate valves as manufactured by Mueller or approved equal.
- B. Insertion Valves
  1. Insertion valve shall be fully functioning, resilient wedge gate valve capable of installation under pressure. Insertion valves shall be furnished with a non-rising stem operating counterclockwise. The body must be stainless steel or ductile iron. Wedges shall be resilient seat complying with AWWA C509. Rated working pressure shall be 250 psi. Tapping machine shall be capable of removing the complete coupon from the host pipe.
- C. Tapping Sleeves
  1. Tapping sleeve shall comply with AWWA C223 and be type 304 stainless steel, outlet flange in accordance with MSS-SP60, certified to ANSI/NSF 61, and shall be rated for 250 psi.
  2. Tapping valve shall meet the same requirements of gate valves.
  3. Provide tapping sleeves as manufactured by Ford Meter Box, Smith Blair Inc., or approved equal.
- D. Line Stop
  1. Line stop shall be 304 stainless steel with epoxy coated carbon steel blind flange and shall be rated for a working pressure of 250 psi.

## 2.06 Valve Boxes

- A. Provide all valves with cast iron boxes in accordance with ASTM A48 Class 30B. Valve boxes shall be screw type with adjustable height, 5-1/4-inch shaft, and suitable for installation in roadway surfaces. Valve boxes shall have extensions necessary to adjust to finished grade.
- B. Valve cover shall be round and marked "WATER".
- C. Where valves are installed behind the back of curb, the curb face shall be marked with a "V" as shown in the standard details.

## 2.07 Fire Hydrant Assemblies

- A. All fire hydrants shall comply with AWWA C502 with 250 psi minimum working pressure and 500 psi hydrostatic test. Hydrants shall be yellow in color, three-way, Starkville standard threads, Mueller Super Centurion A-423, or approved equal. The length of the lower barrel on each hydrant shall be appropriate for the depth of the water main.
- B. A minimum ground clearance of 18" shall be required from the bottom of the hose connection to the finished grade. Where necessary to increase the length of the hydrant barrel, use the appropriate extension kit from the hydrant manufacturer. Any hydrant extensions required to maintain this clearance shall be included in the cost of the hydrant.
- C. All hydrants and valves shall be mechanical joint connections with mechanical joint restraint with ductile iron laterals. Mechanical joint anchor tees will be acceptable as a method of restraint.

1. Drawings are generally schematic, and it is required that the contractor extend and/or modify construction details, as approved by the Engineer, or his authorized representative, when field conditions necessitate such changes to achieve a safe and properly functioning system.
  2. Unless otherwise indicated, lay and join pipe in trenches and on foundation complying with methods proposed by the pipe manufacturer.
  3. Bed pipe on coarse granular material in flat bottom trench with entire pipe barrel bearing uniformly on coarse granular material, except for an approximately eighteen (18) inch gap at pipe balance point for sling removal. Hand excavate and backfill as required to provide uniform and continuous bearing and support for the pipe. Do not support pipe on hubs or end bells. Consolidate coarse granular material under and around pipe up to pipe springline by tamping.
  4. Prevent water from accumulating or running in trench during pipe laying operations or before the trench has been backfilled.
  5. Adjust pipe depth or alignment to accommodate valve, hydrant, or fitting setting, as necessary, with written approval from the Engineer, or his authorized representative, to meet tie-in requirements or to avoid obstructions.
  6. Make all pipe connections with standard factory fabricated fittings except where special connection details, if any, are shown on the drawings and/or details.
  7. Construct and, if necessary, reconstruct water system work as necessary to obtain system free of breaks or excessive leakage.
  8. Cut pipe in a manner to avoid damage to pipe or lining, leaving a smooth end at right angles to pipe axis.
  9. Where existing asphalt is to be saw-cut or scored. Contractor shall perform in such a manner that relatively straight lines remain along the edge of the cut when the asphalt is removed.
- B. Trenching and Excavation
1. Definitions:
    - a. Trench depth is the vertical distance from pipe invert or flow line to finished ground surface.
    - b. Trench width is the horizontal distance between trench walls at any point from one foot above top of pipe to trench bottom.
  2. In stable soil, without bracing, the minimum trench width, to a point 12" above the top of the pipe, shall not be less than the greater of the pipe O.D. plus 16 inches or the pipe O.D. times 1.25 plus 12 inches. Costs of unauthorized deviation from the specified width will be borne by the Contractor.
  3. The maximum trench width shall be the minimum distance necessary to properly place bedding material in the pipe haunch zone and operate tamping and compaction equipment on both sides of the pipe without coming into contact with the pipe.
  4. The trench shall be so braced and drained that workmen may enter and work safely and efficiently. Discharge from dewatering pumps shall be conducted to natural drainage channels, drains, or storm drain systems. No water shall be discharged into the sanitary sewer system.

3. All pipes shall be laid and maintained to the required lines and grades with fittings, valves, and hydrants at the required locations, with all valve stems plumb. Water pipe shall have a minimum of thirty-six inch (36") of cover from the top of the pipe to finished grade.
  4. The trench shall be dug to the alignment and depth indicated in the plans. Bell holes of ample dimensions shall be dug in earth trenches at each joint to permit the joining to be made properly. The pipe shall be laid upon sound soil, cut true and even so that the barrel of the pipe will have a bearing for its full length. Pipe shall be laid with bell ends facing in the direction of laying. Lay pipe upgrade wherever line grade exceeds ten (10) percent. No pipe shall be laid in water. Contractor shall be responsible for providing pumps and/or a well point system, at his own cost, if necessary to maintain a water-free trench.
  5. After placing the length of pipe in the trench, the joint shall be held around the bottom of the spigot so that it will enter the bell as the pipe is shoved into position. The spigot shall be centered in the bell, the pipe forced into position, and brought into true alignment. It shall be secured there with earth carefully tamped under and on each side of it, except at the bell holes. Precautions shall be taken to prevent dirt from entering the joint space.
  6. Wherever necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructions, to plumb stems, or where long radius curves are permitted, the degree of deflection shall not exceed 50% of the pipe manufacturer's recommendations for maximum joint deflection.
  7. At times when pipe laying is not in progress, the open ends of pipe shall be closed by watertight plug or other means. This provision shall apply during the noon hour as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.
  8. Cutting of pipes for inserting fittings or closure and to bring fittings, valves, and hydrants to designated locations shall be done in a neat and workmanlike manner in accordance with instructions of the pipe manufacturer and without damage to the pipe.
  9. Mechanical, push-on, or other type joints shall be installed in strict conformance with the recommendations of the joint manufacturer.
  10. Thrust blocks according to plan details and/or at all plugs, caps, tees, and bends deflecting more than twenty-two and one-half degrees ( $22-1/2^\circ$ ) shall be placed between undisturbed earth and the fitting with a bearing area as designated on the plans.
- G. Pipe Embedment and Backfill
1. Where trench conditions are such that adequate support for the pipe cannot be obtained on the native material, the Engineer or his authorized representative may authorize over-digging the trench a depth of six inches (6") and replace with aggregate or select bedding material as specified in Section 02221.
  2. Generally, loose material left by the excavator on the trench bottom and soft material shaved from the trench excavation will be adequate for bedding the pipe so it is fully supported.
  3. The haunching material shall be native material secured from the trench excavation and thoroughly compacted to the spring line of the pipe and extending to the side walls of the trench. A minimum eighty-five percent (85%) standard proctor will be considered adequate compaction.

fitting, the Contractor shall excavate and expose the existing fitting or main, in order to ascertain its correct location and elevation. This excavation can then be backfilled until the connection is made.

K. Setting or Relocating Fire Hydrants

1. Hydrants shall be located as shown on the plans or as directed by the Engineer, or his authorized representative, in a manner that will provide complete accessibility and prevent the possibility of damage from vehicles or injury to pedestrians. All hydrants shall be set plumb. Each hydrant shall be connected to the main with a six-inch (6") branch line. All hydrant caps shall be removed and greased with AWWA approved grease. After installation, all hydrants shall be tested for satisfactory operation.
2. Minimum height of hose nozzles shall be eighteen inches (18") above ground surface (or anticipated future ground surface) as shown on the plans. Hydrants shall be set with the pumper connection perpendicular to the curb or edge of pavement.
3. Before ordering new hydrants, the Contractor shall determine the barrel length required for all hydrants on the project, both new and relocated. New hydrants shall be ordered in barrel lengths as needed to place a hydrant at each designated location on the project.
4. Hydrants that are installed or have been taken out of service, shall be completely covered in 27" x 42" 4 mil polypropylene orange bag with "NOT IN SERVICE" in bold print secured with tie straps firmly securing the bag to the hydrant until approved for use or removed from the site.
5. Existing fire hydrants designated for relocation shall be carefully disconnected from the existing water main and shall be installed at the locations and in conformance with the details for new hydrants that are shown on the plans.
6. A new gasket and restraint clamp shall be provided for connection of the hydrant to the new main. Existing mechanical joint or flange bolts may be reused if they are in satisfactory condition.
7. After installation is complete or before acceptance of the project, all relocated fire hydrants shall be cleaned and given one coat of suitable paint, yellow in color, as directed by the Engineer, or his authorized representative.
8. Prior to disconnection of existing hydrants, the Contractor shall notify the Fire Chief's Office and give pertinent information as to when and where hydrant will be located.
9. Install one (1) two-way blue reflective raised marker in the center of the lane nearest to and directly perpendicular from each fire hydrant whether newly installed or relocated.

L. Setting Valves and Valve Boxes

1. Valves shall be installed with stems vertical and plumb. All valves not shown on the plans to be located in a concrete vault shall be provided with cast iron valve boxes as a means of protecting and permanently locating the operating nut on the valve. The top of the valve box shall be installed flush with the ground or roadway surface and shall be supported by a suitable foundation. Valve boxes shall be installed where a valve wrench can fit straight over the operating nut. Avoid contact at lower end of valve box with valve body or pipe.
2. The adjustment of casting for new water valves shall include the plumbing and centering of the valve box and riser on the valve nut. A valve wrench shall be used prior to acceptance of adjustment of casting to verify compliance with requirements stated in this

water main and outside of the sewer. The water main shall be installed above the sewer main. At crossings, pipe segments shall be centered to provide maximum spacing of joints of both water and sewer lines. If a vertical separation of eighteen inches (18") cannot be achieved, notification shall be given to the Engineer, and the constraints shall be reviewed on a case-by-case basis.

2. Water mains crossing drain culverts or pipes shall be laid to provide a minimum vertical distance of twelve inches (12") between the outside of the water main and outside of the drain culvert or pipes. Water mains can be installed above or below storm culvert or pipe.

Q. Loop Connections/Dead Ends

1. No dead-end lines are allowed unless approved by the Engineer or his authorized representative. Where dead end lines are permitted, a blow off valve or hydrant is required at the termination of the dead end line.

R. Testing

1. Prior to acceptance by the City, all water systems and services shall be tested in accordance with AWWA C600 or C605, as applicable in the presence of the Engineer or his authorized representative.
2. Pressure Test
  - a. The test pressure shall not be less than 1.25 times the stated working pressure at the highest elevation of the water pipe being tested and not less than 1.5 times the stated working pressure at the lowest elevation of the water main being tested. If the calculated test pressure is less than 150 psi, then a minimum of 150 psi shall be used for the test. Loss of water pressure during the test shall not exceed 5 psi in a two (2) hour period.
  - b. Water pipe shall be tested between valves or plugs in lengths of not more than 1,500 feet and all hydrant valves shall be open. If services are installed, testing shall be conducted up to the curb stop.
  - c. Air Removal – Before applying the specified test pressure, air shall be expelled completely from the water pipe, valves, and hydrants. Contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place at the discretion of the Engineer or his authorized representative. All connections and necessary apparatus shall be furnished by the Contractor.
  - d. Pressurization – Each test section shall be filled with water slowly, and the specified test pressure shall be applied by means of a pump connected to the water pipe. The pump, pipe connection, and all necessary apparatus including the gauges shall be furnished by the Contractor. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. It is good practice to allow the system to stabilize at the test pressure before conducting the leakage test.
  - e. Examination – Any exposed pipe fittings, valves, hydrants, and joints shall be examined carefully during the test. Where leaks are visible at exposed joints and/or evident on the surface where joints are covered, the Contractor shall repair the joints,

five (25) ppm after twenty-four (24) hours standing. This may be expected with an application of fifty (50) ppm, although some conditions may require more.

- c. Prevention of Reverse Flow – Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supply water. Check valves may be used if desired.
- d. Retention Period – Treated water shall be retained in the pipe long enough to destroy all non-spore-forming bacteria. This period shall be at least twenty-four (24) hours and should produce a residual not less than twenty-five (25) ppm at the extreme end of the retention period. If circumstances are such that a shorter retention period must be used, the chlorine concentration shall be increased accordingly. For instance, for a contact period of one (1) hour, a hundred (100) ppm chlorine concentration is required. Under these conditions, special care shall be taken to avoid attack in pipe, valves, hydrants and appurtenances.
- e. Chlorinating Valves and Hydrants – In the process of chlorinating newly installed pipe, all valves or other appurtenances shall be operated while the pipe is filled with the chlorinating agent.
- f. Final Flushing and Testing – Following chlorination, all treated water shall be thoroughly flushed from the newly installed pipe and its extremities until the replacement water throughout its length shall, upon test, be proved comparable in quality to the water served to the Public from the existing water supply system and approved by the Public Health Authority having jurisdiction. The satisfactory quality of water delivered by the new pipe should continue for a period of at least two (2) full days as demonstrated by the laboratory examination of samples taken from a tap located and installed in such a way as to prevent outside contamination.
- g. Repetition of Procedure – Should the initial treatment fail or result in the condition specified, the original chlorination procedure shall be repeated until satisfactory results are obtained. All testing shall be at the Contractor's expense.
- h. Bacteriological Sampling of New Water Mains – After completion of the construction and disinfection of water distribution, the Contractor shall arrange for at least one sample to be collected, on two (2) consecutive days, in accordance with the latest Mississippi State Department of Health guidelines from every dead end line or major looped water pipe for bacteriological examination. A representative of the Department shall be present when the samples are collected. The samples shall be collected by a representative of a laboratory certified by the Mississippi State Department of Health. Water being collected for testing shall not have a chlorine residual higher than is normally maintained in other parts of the distribution system. No chlorine shall be present which is a result of line disinfection. No coliform bacteria and confluent growth indication shall constitute a satisfactory sample when analyzed by the Mississippi Department of Public Health Laboratory or a laboratory certified by the Mississippi Department of Health. The Contractor shall be responsible for achieving acceptable tests and shall pay all costs involved. The testing and disinfection operations shall be coordinated with the local water utility operator.

#### **PART 4 – MEASUREMENT AND PAYMENT**

- a. Tapping sleeve and valve connected thereto shall be measured by the specified size of the tapping sleeve and valve. Both tapping sleeve and valve along with labor and other incidentals required to make the tap shall be included in the bid price of the item.
- 4. Line Stop
  - a. Line stop for the size specified will be measured per each and shall be full compensation for furnishing all labor, equipment, materials, and testing required to complete the work.
- D. Fire Hydrants
  - 1. Fire Hydrant Assembly
    - a. Hydrant assembly will be measured by the completed unit per each and will consist of the hydrant, anchoring tee, 6" gate valve, retainer glands and joint restraints, as required, two-way blue reflective raised marker, and 6" C900 PVC water pipe from the 6" hydrant valve to the hydrant and shall be full compensation for furnishing all labor, equipment, materials, and testing required to complete the work.
    - b. Any additional 6" C900 PVC water main required from the water main to the 6" gate valve will be paid for under the appropriate pay item.
    - c. The labor and materials necessary to paint new hydrants will not be measured for separate payment but shall be included in the unit price bid for the new hydrant.
  - 2. Relocate Fire Hydrant
    - a. Hydrant relocations will be measured per each and will include all labor, materials, equipment, and testing necessary to complete the work.
    - b. The labor and materials necessary to paint relocated hydrants will not be measured for separate payment but shall be included in the unit price bid for relocation of the existing hydrant.

**4.02 Payment**

- A. The prices thus bid shall be full compensation for completing the work specified. Materials or work for which a pay item is not included and are necessary to complete the work under this section shall be furnished or performed and shall be considered incidental to the completed construction.

B. Payment shall be made in accordance with the following Pay Item No.:

02660-A	___" C900 PVC Water Main	per linear foot
02660-B	___" Ductile Iron Water Main	per linear foot
02660-C	Fittings	per ton
02660-D	___" Gate Valve	per each
02660-E	___" Insertion Valve	per each
02660-F	___"x___" Tapping Sleeve & ___" Valve	per each
02660-G	___" Line Stop	per each
02660-H	Fire Hydrant Assembly	per each
02660-I	Relocate Fire Hydrant	per each

**END OF SECTION**

### 1.05 Miscellaneous Requirements

- A. The engineer or developer shall obtain all necessary permits, and the contractor is responsible for coordinating all work with the permit grantor.
- B. Trenches shall be constructed so as not to harm any shade trees, shrubs, or flower beds near residences, or any other item called to special attention. All stumps and roots encountered in the trench shall be cut back enough so that in no instance shall they come in contact with the pipe. Suitable fill material shall be added to the trench to cushion the pipe in instances where roots or large stone, etc. cannot be removed. All clean-up is the responsibility of the contractor.

## PART 2 – PRODUCTS

### 2.01 General

- A. All furnished materials shall be new and accompanied by a manufacturer's certificate that his product meets these applicable specifications.

### 2.02 Service Pipe and Casing

- A. Pipe Material
  - 1. Water service pipe shall be crosslinked polyethylene (PEXa) municipal water service pipe in accordance with AWWA C904 and ASTM F876 with outside diameter and wall thickness complying with CTS SDR9 dimensions and approved for use with AWWA C800 fittings.
  - 2. Surface color shall be UV resistant blue which shall resist exposure from sunlight for up to one year.
  - 3. Shall be Rehau Municipex (Pex a) or approved equal.
- B. Casing
  - 1. Service connections under vehicular traffic areas shall be encased in new PVC pipe in accordance with Section 02660.
    - a. The minimum cover shall be thirty-six (36) inches when measured from the top of the casing pipe.
    - b. Service pipe in casing shall be continuous with no joints.

### 2.03 Fittings

- A. Tapping Saddles
  - 1. Tapping saddles for use on water mains less than 4" in diameter shall be 304 stainless steel with with Buna-N gasket per ASTM D2000 and NSF 61 approved. Saddle shall be rated for a working pressure of 250 psi (not to exceed the pressure rating of the pipe). Outlet sizes shall be corporation cock (CC) threads. Saddle shall be equivalent to Ford FS313 Series or approved equal.
  - 2. Tapping saddles for use on water mains 4" in diameter and larger shall be double strap type. Saddle bodies shall be constructed of ductile iron in accordance with ASTM A536 and coated with a fusion bonded epoxy to a minimum thickness of 12 mils.

2. Direct bury wire connectors shall be specifically manufactured for use in underground tracer wire installation. Connectors shall be dielectric silicon filled to seal out moistures and corrosion and shall be installed in a manner so as to prevent any uninsulated wire exposure.

### **PART 3 – EXECUTION**

#### **3.01 Preparation**

- A. Protect and support existing water mains, sewer lines, utilities, and appurtenances.
- B. Avoid damage or shock in handling pipe and accessories. Inspect all service and casing pipe and reject any defective piece. Carefully protect pipe in place from damage or displacement until backfilling operations are complete.
- C. Remove large stones or other hard materials that could damage pipe or impede consistent backfilling or compaction.

#### **3.02 Construction Requirements and Installation**

##### **A. General**

1. Drawings are generally schematic, and it is required that the contractor extend and/or modify construction details, as approved by the Engineer, or his authorized representative, when field conditions necessitate such changes to achieve a safe and properly functioning system.
2. Residential subdivisions shall have service connections, including meter boxes at finished grade, pre-installed by the Contractor. New service lines which are not tied into a meter during construction shall terminate at a meter box at the right-of-way line. The proper stop valves will be installed on the line as necessary to protect the system.
3. New service lines shall be of equal size as the existing service line, but no less than one-inch (1"), unless otherwise specified on the plans or as directed by the Engineer or his authorized representative. A residential single service line shall be a minimum of one-inch (1"). A residential double service line shall be two-inch (2"), or as directed by the Engineer or his authorized representative.
4. Water services shall be installed in accordance with the recommendations of both the pipe main manufacturer and the service line manufacturer. Make all pipe connections with standard factory fabricated fittings except where special connection details, if any, are shown on the drawings and/or details. Cut pipe in a manner to avoid damage to pipe or lining, leaving a smooth end at right angles to pipe axis.
5. Where existing asphalt is to be saw-cut or scored. Contractor shall perform in such a manner that relatively straight lines remain along the edge of the cut when the asphalt is removed.
6. Restore ground surface to original condition. The Contractor shall replace or repair any damaged improvements at no additional cost.
7. The Contractor shall mark the face of the curb, where present, with a "W" stamped into the wet concrete where the curb is finished over the water service and shall keep construction records showing all lines, fittings, valves, taps, etc., with sufficient data to accurately locate these items after the trench has been backfilled. In the event of a

3. No additional compensation will be allowed for this operation.
- E. Parallel Installation
  1. Water service connections shall be installed at the opposite corner of the lot from sewer service connections.
- F. Testing
  1. All testing shall be done in accordance with Section 02660.

#### **PART 4 – MEASUREMENT AND PAYMENT**

##### **4.01 Method of Measurement**

- A. Water service of the size specified will be measured by the linear foot and shall be full compensation for furnishing all labor, equipment, materials, and testing required to complete the work. Meter boxes, service saddles or connections, corporation stop, branches, curb stop, and any other fittings required will not be measured for separate payment but shall be included in the price bid for service lines.
- B. Relocation of existing meter shall include all labor, equipment, materials, and testing required to complete the work. Meter relocation, reinstallation of the existing meter in a new meter box, and any other fittings required shall be included in the price bid for relocation of existing meter.
- C. All pressure testing, flushing, and sterilization of water mains and services shall be done by the Contractor and will not be measured for separate payment. These costs shall be included in the contract unit bid prices for water pipe items.
- D. Stamping service line locations in the curb will not be measured for separate payment. The stamping shall take place while the curbs are being installed.

##### **4.02 Payment**

- A. The prices thus bid shall be full compensation for completing the work specified. Materials or work for which a pay item is not included and are necessary to complete the work under this section shall be furnished or performed and shall be considered incidental to the completed construction.
- B. Payment shall be made in accordance with the following Pay Item No.:

02661-A	___" Water Meter and Box	per linear foot
02661-B	Relocation of Existing Meter	per each

**END OF SECTION**

- R. ASTM D3034 – Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- S. ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- T. ASTM F477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- U. ASTM F679 – Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
- V. ASTM F1417 – Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air

### **1.03 Submittals**

- A. Product Data: Submit manufacturer information regarding pipe materials, pipe fittings, manholes, accessories, and pipe bedding and backfill material.
- B. Shop Drawings: For manholes, include plans, elevations, sections, details, and frames and covers.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- E. Emergency plan detailing procedures to be followed in the event of pump failures, sewer overflows, service backups, and sewage spillage. Maintain a copy of emergency plan on site for duration of project.

### **1.04 Quality Assurance**

- A. Perform work in accordance with Starkville Utilities, City of Starkville, and other applicable local, state, and federal standards and requirements.
- B. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- C. Schedule and conduct work in a manner which will minimize inconvenience to vehicular and pedestrian traffic. Provide flaggers, barricades, warning signs, warning lights, and other warning means as appropriate. Maintain traffic on all roads and streets which must be crossed by trenching by making two separate cuts so that at least one traffic lane is open at all times. All traffic control devices used during construction must conform to Part 6 of the Manual on Uniform Traffic Control Devices, latest edition.

### **1.05 Miscellaneous Requirements**

- A. In instances where the collection mains cross state highways or railroad, the sewer mains shall be installed per requirements of the Mississippi Department of Transportation or railroad. Construction shall be in accordance with an approved permit.
- B. The engineer or developer shall obtain all necessary permits, and the contractor is responsible for coordinating the crossing with the permit grantor.
- C. Trenches shall be constructed so as not to harm any shade trees, shrubs, or flower beds near residences, or any other item called to special attention. All stumps and roots encountered in the trench shall be cut back enough so that in no instance shall they come in contact with the pipe. Suitable fill material shall be added to the trench to cushion the pipe in instances

- B. All bells shall be formed integrally with the pipe and shall contain a positively retained, factory installed elastomeric gasket and have a raceway or groove specially formed to accept and retain the gasket.
- C. Wall thickness of the bell at any point shall not be less than the required minimum for the pipe barrel. Pipe spigots shall be beveled and have insertion stop marks.
- D. The use of solvent cement or chemically welded joints shall not be permitted in field construction, except as specifically authorized by the Engineer.
- E. All pipe joints other than those specified herein shall be made in strict accordance with the manufacturer's recommendations and as approved by the Engineer.
- F. All joints shall be made watertight in accordance with the latest applicable AWWA and ASTM standards.
- G. Lubricant shall be provided by the pipe manufacturer and applied as per the manufacturer's recommendations. Lubricant shall be non-toxic, not support the growth of bacteria and have no deteriorating effects on the gasket or pipe material. Containers shall be appropriately identified and labeled with the manufacturer's name, and each shall have printed instructions for usage and joint assembly.

#### **2.05 Gaskets for PVC Joints and Fittings**

- A. Gaskets shall be molded or extruded from a high grade, vulcanized, elastomeric compound consisting of either a basic natural or synthetic rubber.
- B. Gaskets shall be marked for nominal pipe size, manufacturer, and year of manufacture.
- C. Gaskets shall comply with the requirements of ASTM F477 and D3212.

#### **2.06 Ductile Iron Sewer Pipe and Fittings**

- A. Ductile iron pipe for gravity sewer or force mains shall be designed in accordance with ANSI/AWWA C150/A21.50 and manufactured in accordance with ANSI/AWWA C151/A21.51 with cement-mortar lining in accordance with ANSI/AWWA C104/A21.4.
- B. Joints shall conform to ANSI/AWWA C111/A21.11 and shall be of the push on or mechanical type except where flanged joints are indicated on the plans.
- C. Fittings shall be ductile iron with flanged or mechanical end joints conforming to ANSI/AWWA C153/A21.53 and cement mortar lined in accordance with ANSI/AWWA C104/A21.4.
- D. Provide 8 mil minimum thickness polyethylene encasement (wrap) on all buried ductile iron pipe, fittings, and accessories in accordance with ANSI/AWWA C105/A21.5. Polyethylene encasement material shall consist of three layers of co-extruded linear low-density polyethylene (LLDPE), fused into a single layer. The inside surface of the polyethylene wrap shall be infused with an anti-microbial biocide to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion. The color shall be white. Polyethylene encasement wrap shall be included in the cost of the installation of the ductile iron water pipe, fittings, and accessories.

#### **2.07 Pre-Cast Concrete Manholes**

- A. Pre-cast concrete manholes have a minimum internal diameter of 48-inches (48") and shall conform to ASTM C478 with a minimum wall thickness of five inches (5"), a minimum base

bearing surfaces shall be machine finished. Covers shall have "SANITARY SEWER" cast on the surface and shall be custom lid designed for City of Starkville.

3. The material for the seals between the frames and concrete shall be a bitumastic gasket material, meeting or exceeding ASTM C990. Bitumastic gasket material shall be Ram-Nek, EZ-STIK, or approved equal.

## **2.08 Pipe Detection Components**

- A. Pipe Detection Tape: Non-corrosive metallic, 3" wide, metal core enclosed in protective plastic jacket, green in color, with block letters reading "Buried Sewer Line Below," or "Buried Force Main Below," as necessary. Tape shall be readily detected by electronic pipe locator instruments in general use.
- B. Pipe Detection Wire
  1. Tracer wire shall be fourteen (14) gauge solid copper insulated locator wire and green in color.
  2. Direct bury wire connectors shall be specifically manufactured for use in underground tracer wire installation. Connectors shall be dielectric silicon filled to seal out moistures and corrosion and shall be installed in a manner so as to prevent any uninsulated wire exposure.

## **PART 3 – EXECUTION**

### **3.01 Preparation**

- A. Protect and support existing water mains, sewer lines, utilities, and appurtenances.
- B. Avoid damage or shock in handling pipe and accessories. Inspect each length of pipe and reject any defective piece. Carefully protect pipe in place from damage or displacement until backfilling operations are complete.
- C. Remove large stones or other hard materials that could damage pipe or impede consistent backfilling or compaction.
- D. Pipe Cutting:
  1. Cut pipe ends square, ream pipe ends to full pipe diameter, and remove burrs.
  2. Use only equipment specifically designed for pipe cutting; use of chisels or hand saws is not permitted.
  3. Grind edges smooth with beveled end for push-on connections.
- E. When pipe laying activity is not in actual progress, tightly cover open ends of pipe. Avoid permitting dirt, mud, or other material from entering pipe at any time.
- F. Prepare pipe connections to equipment with flanges or unions.

### **3.02 Construction Requirements and Installation**

- A. General
  1. Drawings are generally schematic, and it is required that the contractor extend and/or modify construction details, as approved by the Engineer, or his authorized representative, when field conditions necessitate such changes to achieve a safe and properly functioning system.

2. The Contractor shall comply with the sewer flow control requirements above before conducting any trenching operations that cut into existing sewer lines or force mains.
  3. In stable soil, without bracing, the minimum trench width, to a point 12" above the top of the pipe, shall not be less than the greater of the pipe O.D. plus 16 inches or the pipe O.D. times 1.25 plus 12 inches. Costs of unauthorized deviation from the specified width will be borne by the Contractor.
  4. The maximum trench width shall be the minimum distance necessary to properly place bedding material in the pipe haunch zone and operate tamping and compaction equipment on both sides of the pipe without coming into contact with the pipe.
  5. The trench shall be so braced and drained that workmen may enter and work safely and efficiently. Discharge from dewatering pumps shall be conducted to natural drainage channels, drains, or storm drain systems. No water shall be discharged into the sanitary sewer system.
  6. The Contractor shall confine his excavation to the allowable trench width noted. Over-digging is not permitted unless authorized by the Engineer or his authorized representative. An open trench in advance of pipe laying operations at the close of the workday will not be permitted.
  7. Excavated materials not suitable for backfill or embankment shall not be incorporated into the project but shall be disposed of by the Contractor.
  8. Excavate with caution so that structures and underground conduits can be protected.
  9. Trenching and excavation shall be incidental and an absorbed cost.
- D. Pipe Bedding
1. Where unstable conditions are encountered at the trench bottom, the Contractor shall immediately notify the Engineer or his authorized representative. Upon the Engineer's, or his authorized representative's, determination that unstable soil conditions exist, the trench bottom shall be excavated to the depth necessary to install a minimum 6" thick foundation of approved bedding material as specified in Section 02221.
  2. No compensation will be provided for over-excavated areas and bedding material installed without prior approval from the Engineer or his authorized representative.
- E. Sheathing and Shoring
1. The Contractor shall place such sheathing and shoring, or trench boxes, in trenches as may be necessary to support properly the trench walls and any adjacent structures. The type and amount of sheathing and shoring shall be such as the nature of the ground condition may require. It shall be the sole responsibility of the Contractor to provide such sheathing, shoring, trench boxes, and bracing as may be required for the safe conduct of the Work. No additional compensation will be allowed for this operation.
  2. No actions or instructions by the Owner or his authorized representative shall be regarded as his responsibility for the security of the trench or protection of workmen. The full responsibility shall remain with the Contractor.
- F. Dewatering
1. The Contractor shall keep all excavations free from water at his own expense while pipe laying is in progress and to such extents as may be necessary while excavation work alone is being carried on. He shall provide for the disposal of the water removed from excavations in such a manner as not to cause injury to the public health, to public or

7. At times when pipe laying is not in progress, the open ends of pipe shall be closed by watertight plug or other means. This provision shall apply during the noon hour as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.
  8. Cutting of pipes for inserting fittings or closure pieces shall be done in a neat and workmanlike manner in accordance with instructions of the pipe manufacturer and without damage to the pipe.
  9. Pipe laying shall proceed upgrade, starting at the lower end of the grade and with the bells uphill.
- H. Pipe Embedment and Backfill
1. Where trench conditions are such that adequate support for the pipe cannot be obtained on the native material, the Engineer or his authorized representative may authorize over-digging the trench a depth of six inches (6") and replace with aggregate or select bedding material as specified in Section 02221.
  2. Generally, loose material left by the excavator on the trench bottom and soft material shaved from the trench excavation will be adequate for bedding the pipe so it is fully supported.
  3. The haunching material shall be native material secured from the trench excavation and thoroughly compacted to the spring line of the pipe and extending to the side walls of the trench. A minimum eighty-five percent (85%) standard proctor will be considered adequate compaction.
  4. Backfilling shall be made with the material removed from the trench or excavation, provided that the excavated material is suitable for backfilling. Suitable material shall be material that will compact readily when the usual methods of mechanical tamping are used. All backfill material shall be free from cinders, ashes, roots, refuse, vegetative material, excess organic material, rocks, stones, or other unsuitable material.
  5. All trenches shall be backfilled immediately after the pipe has been laid and inspected. Backfilling shall include the refilling and compaction of the fills in the trenches or excavation to the existing ground surface or to the existing road subgrade.
  6. In the event that existing material is unsuitable for backfill, borrow material meeting the requirements of Section 02221 may be used. This borrow material must be from a pre-approved source. The placement of borrow material must be approved the Engineer or his authorized representative.
  7. When backfilling within the pipe zone, special care shall be exercised not to cause settlement or lateral movement. To safeguard against movement of pipelines or structures, the Contractor shall place the backfill in small layers and shall thoroughly compact each layer with hand-operated, power-driven vibrating compactors to obtain the specified density.
  8. All trenches shall be backfilled by hand or by approved mechanical methods from the bottom of the trench to a depth of one foot (1') above the pipe with fill placed in layers of six inches (6") and compacted by tamping to ninety-five percent (95%) density in accordance with ASTM D 1557, so as to ensure that the backfill is well placed and compacted beneath the haunches of the pipe. Backfilling material shall be deposited in the trench for its full width of each side of the pipe, fittings, and appurtenances

8. Where indicated on the plans, drop connections shall be neatly and accurately constructed in strict accordance with the details shown on the plans.
  9. Place and connect manhole frame to manhole as shown in the details. Frames shall be set to line and grade in such a manner that subsequent adjustments will not be necessary. On paved streets, the frame and cover shall be set flush with and in the plane of the paved surface.
  10. Backfill shall be in accordance with this specification. Density tests shall be taken around all four (4) sides of manholes to assure proper compaction.
- J. Connections to Existing Manholes
1. When removing sewer lines, the Contractor shall break out the existing sewer at all manholes and grout a new gasket in the manhole wall. The new sewer pipe shall be installed after the grout has been given sufficient time to set up. The Contractor shall repair any damage done to the invert of the existing manhole at his own expense.
  2. New manhole connections to precast concrete bases can be made with elastomeric gasket seals such as ALOK or Press Seal PSX. Connections to poured in-place manholes shall use manhole adapters or waterstops.
- K. Tracer Wire
1. Tracer wire shall be placed directly on the center of the sewer main(s) for its entire length and shall be secured to the pipe with plastic ties at five foot (5') intervals. Tracer wire shall be installed as a single, continuous wire, except where using approved connectors with no looping or coiling. Any damage to tracer wire during installation must be immediately repaired by removing the damaged wire and installing a new section of wire with approved connectors. Taping and/or spray coating will not be allowed.
  2. Tracer wire must terminate inside manholes and at sewer cleanouts.
  3. Where connecting to existing tracing wire, the new trace wire and existing trace wire shall be connected using approved connectors and grounded at the splice location.
  4. No additional compensation will be allowed for this operation.
- L. Marking Tape
1. All sewer main(s) must be installed with a non-corrosive metallic tape directly over the center of the facility per manufacturer's recommendations and shall be as close as practical to finished grade while maintaining a required minimum of 18" between the tape and the top of any pipe. Tape must be connected to all facilities or appurtenances. The tape shall have a three-inch (3") width and the words "Buried Sewer Line Below" or "Buried Force Main Below," or similar wording should be printed on it along its entire length with the wording facing upward. No additional compensation will be allowed for this operation.
- M. Parallel Installation
1. Sanitary sewer mains shall be located on opposite sides of the street from water mains where possible.
  2. Sewer mains and water mains shall be laid in separate trenches.
  3. Water mains shall be laid at least ten (10) feet horizontally and eighteen (18) inches vertically from any existing or proposed sanitary sewer main, service, or manhole.
  4. The sanitary sewer shall be installed under the water main.
  5. The distances will be measured edge to edge.

- d. The Owner reserves the right to mandrel test any sewer pipe before acceptance, and also prior to expiration of the first year of operation. If a previously accepted line fails a mandrel test performed during the first year of operation, the defects must be corrected at the Contractor's expense.
7. Leakage Test
    - a. The Contractor shall conduct an infiltration or air test for leakage as determined by the Engineer. Testing shall be conducted in accordance with all applicable safety standards.
    - b. The Contractor shall furnish all supplies, materials, labor, services, etc., needed to perform the testing. No separate payment will be made for equipment, supplies, material, water, or services.
    - c. Any leakage, including active seepage, shall be corrected where such leakage exists until the pipelines meet the requirements of the allowable leakage specifications.
    - d. Infiltration tests shall be made when the groundwater level is two feet (2') or more above the top of the outside of the pipe. Infiltration shall not exceed twenty-five (25) gallons per twenty-four (24) hours per inch of diameter per mile of sewer.
    - e. After backfill operations have been completed, conduct a low pressure air test in accordance with ASTM F1417.
  8. Video Inspection
    - a. The Contractor shall thoroughly clean all mains and/or lines to be video inspected so that the entire pipe (top to bottom) is visible. Sewer gravity main inspection shall be performed from manhole to manhole.
    - b. The Contractor shall be responsible for plugging active lines, the proper disposal of waste from the lines to be videoed, and any bypass pumping required to satisfactorily complete the video(s).
    - c. Multiple segments of sewer gravity mains may be video inspected utilizing one setup from a manhole provided the footage counter of each gravity main inspected begins with zero beginning at the setup manhole to establish a uniform starting point for each line segment. If the counter distance and measured distance differs by more than two (2') feet, the run shall be re-videoed at no additional cost.
    - d. The interior of the pipe shall be carefully inspected to determine the location and extent of all deficiencies. Video inspection shall include a 360° view of all joints and service connections. Pipe conditions that result in a question of proper installation shall be noted and located using the footage counter on a log for review by the Engineer prior to final acceptance of the sewer system.
    - e. Video inspection information shall include the upstream and downstream sewer manhole ID as shown on the plans, sewer main diameter, pipe material, direction of movement of the camera, date, and time.
    - f. Video inspection submittal shall be provided to the Owner on a flash drive with the ability for the information to be downloaded or reproduced along with a log locating and describing any deficiencies discovered during the video inspection process. Label shall include Contractor's Name, project name, and date of inspection.
    - g. Any of, but not limited to, the following observations shall be considered defects: bellies in a joint of pipe, joint separations, offset joints, chips in pipe ends, cracked or

10-12	:30	:39	:48	1:07
12-14	:35	:46	:57	1:18
14-16	:40	:52	1:05	1:29
Add for each Additional 2'	:05	:07	:08	:11

- iii. Manhole vacuum levels observed to drop greater than 1-inch of mercury (final vacuum less than 9 inches of mercury) will have failed the test and will require additional work or rehabilitation. The Contractor shall make the necessary repairs at no additional compensation. The manhole shall be retested as described above until a successful test is made.

**PART 4 – MEASUREMENT AND PAYMENT**

**4.01 Method of Measurement**

**A. PVC and Ductile Iron Sewer Pipe**

1. Sewer lines of the size, material, and depth intervals specified will be measured in place, by length in linear feet along centerline to each line from center to center of intersecting lines or to the farthest extent of terminal fittings with no deductions for fittings, etc., and shall be full compensation for furnishing all labor, equipment, materials, and testing required to complete the work. Depth of cut will be measured from the bottom of the pipe to the finished grade above the pipe.
2. Bedding, if required, will be measured as the trench width (as defined in this section) times six inches for the amount of pipe where required and will be paid in accordance with Section 02221.
3. Borrow material, if required, will be measured as the trench width (as defined in this section) times the O.D. of the pipe plus 12" for the amount of pipe where required and will be paid in accordance with Section 02221.
4. Excavation, sheathing, shoring, dewatering, bypass pumping, marking tape, locator wire, blocking, backfilling, and tie-ins for sewer lines will not be measured for separate payment but shall be included as a part of the item of sewer line, manhole, or fitting furnished and installed.
5. All testing and inspection of new sewer lines and services shall be done by the Contractor and will not be measured for separate payment. These costs shall be included in the contract unit bid prices for sewer line items.

**B. Fittings**

1. Ductile iron fittings and joint restraints will be measured by the ton (2,000 lb/ton) and shall be full compensation for furnishing all labor, equipment, materials, and testing required to complete the work. Regardless of the type of ductile iron fitting used, weight for payment will be in accordance with those published in AWWA C153. Joint restraints shall be measured in addition to the fitting and shall utilize the weights listed on the submittal for payment. Payment shall be made under Section 02660.

**C. Manholes**

**SECTION 02731**  
**SEWER SERVICES**

**PART 1 – GENERAL**

**1.01 Summary**

- A. The section includes furnishing all labor, equipment and materials and performing all operations in connection with the installation of gravity sanitary sewer services, as indicated on the drawings and as specified herein.
- B. Related Sections
  - 1. Section 02730 – Gravity Sanitary Sewers

**1.02 References**

- A. ASTM D1784 – Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
- B. ASTM D2152 – Standard Test Method for Adequacy of Fusion of Extruded Poly(Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion
- C. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- D. ASTM D2444 – Standard Practice for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)
- E. ASTM D3034 – Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- F. ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- G. ASTM F477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

**1.03 Submittals**

- A. Product Data: Submit manufacturer information regarding pipe materials, pipe fittings, manholes, accessories, and pipe bedding and backfill material.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- D. Emergency plan detailing procedures to be followed in the event of pump failures, sewer overflows, service backups, and sewage spillage. Maintain a copy of emergency plan on site for duration of project.

**1.04 Quality Assurance**

- A. Perform work in accordance with Starkville Utilities, City of Starkville, and other applicable local, state, and federal standards and requirements.
- B. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- C. Schedule and conduct work in a manner which will minimize inconvenience to vehicular and pedestrian traffic. Provide flaggers, barricades, warning signs, warning lights, and other

- D. Fittings shall only be used for service connection or as shown on plans or as directed by the Engineer. Generally, any change in direction of the gravity sewer line will be facilitated by use of a manhole.
- E. Lubricant shall be provided by the pipe manufacturer and applied as per the manufacturer's recommendations. Lubricant shall be non-toxic, not support the growth of bacteria and have no deteriorating effects on the gasket or pipe material. Containers shall be appropriately identified and labeled with the manufacturer's name, and each shall have printed instructions for usage and joint assembly.

#### **2.04 PVC Pipe Joints**

- A. Joints shall be of the push-on, elastomeric gasket type, conforming to ASTM D3212.
- B. All bells shall be formed integrally with the pipe and shall contain a positively retained, factory installed elastomeric gasket and have a raceway or groove specially formed to accept and retain the gasket.
- C. Wall thickness of the bell at any point shall not be less than the required minimum for the pipe barrel. Pipe spigots shall be beveled and have insertion stop marks.
- D. The use of solvent cement or chemically welded joints shall not be permitted in field construction, except as specifically authorized by the Engineer.
- E. All pipe joints other than those specified herein shall be made in strict accordance with the manufacturer's recommendations and as approved by the Engineer.
- F. All joints shall be made watertight in accordance with the latest applicable AWWA and ASTM standards.
- G. Lubricant shall be provided by the pipe manufacturer and applied as per the manufacturer's recommendations. Lubricant shall be non-toxic, not support the growth of bacteria and have no deteriorating effects on the gasket or pipe material. Containers shall be appropriately identified and labeled with the manufacturer's name, and each shall have printed instructions for usage and joint assembly.

#### **2.05 Gaskets for PVC Joints and Fittings**

- A. Gaskets shall be molded or extruded from a high grade, vulcanized, elastomeric compound consisting of either a basic natural or synthetic rubber.
- B. Gaskets shall be marked for nominal pipe size, manufacturer, and year of manufacture.
- C. Gaskets shall comply with the requirements of ASTM F477 and D3212.

#### **2.06 Clean-Out Pads and Covers**

- A. Cast iron clean-out covers and frames, where required, shall be round and marked "SEWER" as manufactured by EJ, or approved equal. Cast iron clean-out covers and frames shall be flush with pavement surface.
- B. Provide a concrete pad around the clean-out top and set with clean-out tops one half (1/2) inch above surrounding grade in non-paved areas. Place rebar in concrete pad for location purposes.

4. Control geometric position of pipe to ensure that pipe and fittings accurately conform with grade and alignment requirements. Lay pipe in a straight line for proper alignment. Install piping at indicated slopes, free of sags and bends.
  5. Prevent water from accumulating or running in trench during pipe laying operations or before the trench has been backfilled.
  6. Make all pipe connections with standard factory fabricated fittings except where special connection details, if any, are shown on the drawings and/or details.
  7. Construct and, if necessary, reconstruct all piping systems as necessary to obtain systems free of breaks, detectable leakage, and other defects.
  8. Cut pipe in a manner to avoid damage to pipe or lining, leaving a smooth end at right angles to pipe axis.
  9. Where existing asphalt is to be saw-cut or scored. Contractor shall perform in such a manner that relatively straight lines remain along the edge of the cut when the asphalt is removed.
- B. Trenching and Excavation
1. Excavate with caution so that structures and underground conduits can be protected.
  2. Trenching and excavation shall be incidental and an absorbed cost.
- C. Sewer Service Installation
1. New six-inch (6") diameter PVC sewer service lines shall be installed from the wyes in all existing and in all new sewer mains. They shall be installed from the main to the right-of-way or easement line, as determined by the Owner, to replace each existing service line and for each new service line. Additional services can be installed as indicated on the plans or as authorized by the Owner or his authorized representative.
  2. Unless otherwise directed or permitted by the Owner or his authorized representative, new service lines shall follow the line and grade of the existing service, which will, in most cases, ensure removal of the old services from the ground. All existing service lines shall be removed upon installation of the new service.
  3. The depth of the service line at the point of connection for each property owner shall be sufficient to permit connection to the existing private sewer lines at a minimum grade of one-eighth inch (1/8") per foot.
  4. The Contractor shall verify house connections during excavation. The installation of new service lines to accommodate future development may be directed by the Owner or his authorized representative.
  5. All sewer service lines shall join the main sewer at a wye. Wyes shall be placed at all existing service locations. When the installation of a service line connection to an existing PVC main is required by the Owner or his authorized representative, the use of an approved saddle type connection will be permitted. All metal parts on saddle type connectors must be stainless steel.
  6. New clean-outs shall be installed on all service lines in accordance with the details on the plans. Sewer clean-outs located in unpaved areas shall have a 24-inch by 24-inch by 4-inch thick concrete pad placed around the cleanout in accordance with the details on the plans. Sewer clean-outs located in paved areas will have a cast iron clean out cover.
  7. Sewer service lines shall be connected to existing private lines at the right-of-way or easement line, as determined by the Owner, with an approved adapter. Contractor shall

water main and outside of the sewer. The water main shall be installed above the sewer main. At crossings, pipe segments shall be centered to provide maximum spacing of joints of both water and sewer lines. If a vertical separation of eighteen inches (18") cannot be achieved, notification shall be given to the Engineer, and the constraints shall be reviewed on a case-by-case basis.

2. Prior to installing storm drains, the Contractor shall verify sewer lateral locations and grades. In the event that a sanitary sewer service conflicts with an existing or proposed storm drain, the sewer service shall be re-routed over or under the storm drain, whichever will allow proper flow from the clean-out to the sewer main. If re-routing is not possible, the Contractor shall contact the Engineer or his authorized representative to discuss alternate methods to resolve the problem.
- I. Testing and Inspection
1. All testing and inspection shall be done in accordance with Section 02730.

## **PART 4 – MEASUREMENT AND PAYMENT**

### **4.01 Method of Measurement**

#### **A. Sanitary Sewer Service**

1. Sewer services of the size and material specified will be measured in place, by length in linear feet along centerline to each line from center to center of intersecting lines or to the farthest extent of terminal fittings with no deductions for fittings, etc., and shall be full compensation for furnishing all labor, equipment, materials, and testing required to complete the work.
2. Excavation, sheathing, shoring, dewatering, bypass pumping, PVC fittings, marking tape, locator wire, blocking, backfilling, and tie-ins for sewer lines will not be measured for separate payment but shall be included as a part of the item of sewer line furnished and installed.
3. Removal of existing service lines shall be included in the cost of the installation of the new sewer service line.
4. All testing and inspection of new sewer lines and services shall be done by the Contractor and will not be measured for separate payment. These costs shall be included in the contract unit bid prices for sewer line items.
5. Stamping service line locations in the curb will not be measured for separate payment. The stamping shall take place while the curbs are being installed.

#### **B. Sewer Clean-Out**

1. Sewer clean-outs shall include all labor, equipment, and materials to complete the work. Concrete pad, PVC fittings and cap, and cast iron clean-out cover shall be included in the price bid for sewer clean-outs.
2. PVC pipe used for clean-outs shall be measured in linear feet as sanitary sewer service.

### **4.02 Payment**

- A. The prices thus bid shall be full compensation for completing the work specified. Materials or work for which a pay item is not included and are necessary to complete the work under