



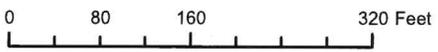
**Lincoln Terrace Lot Tract Lying S of BLK 3 and N of BLK 4,
Sec. 32, T9N, R2W I.M. (Parcel ID: NC29LINCT 3 001)**

Legend
 SMP-18 Flood Plain Permit Parcel



Map Produced by the City of Norman
 Geographic Information System.

The City of Norman assumes no
 responsibility for errors or omissions
 in the information presented.



January 30, 2026



conditions (temperature, moisture level, and thermal conductivity of the soil). The heat source temperatures shall be monitored and logged during the cure and cool down cycles. The manufacturer's recommended cure schedule shall be submitted.

5. Steam Venting – The mixture of steam and air created during the curing of the CIPP service tap must be vented out of the sewer collection system or service pipe cleanout. Under no circumstances shall steam be vented through building structures.
6. CIPP Processing – Curing shall be done without pressure interruption with air or a mixture of air and steam for the proper duration of time per the resin manufacturer's recommendations. The curing process is complete when the temperature of the CIPP reaches 100 degrees Fahrenheit or less, the processing shall be finished

2.11 TESTING AND INSPECTION

A. Testing

1. Chemical Resistance: The CIPP shall meet the chemical resistance requirements of ASTM F1216, Appendix X2. CIPP samples for testing shall be of tube and resin system similar to that proposed for actual construction. It is required that CIPP samples with and without plastic coating meet these chemical-testing requirements.
2. CIPP Field Samples: When requested by the OWNER, the Contractor shall submit test results from field installations in the USA of the same resin system and tube materials as proposed for the actual installation. These test results must verify that the CIPP physical properties specified have been achieved in previous field applications. Samples for this project shall be made and tested as described in the Field Testing Section below.
3. Any liner that doesn't meet the quality standards using CIPP methods will be cut out or dug and replaced. Grout or epoxies will not be an allowable repair method.

B. On Site Field Inspection

1. Post-construction CCTV inspection shall be performed on all CIPP rehabilitated sewer mains and shall be conducted from the main, televising to the ends of both the main line wrap and lateral liner termination.

2.12 SITE CLEAN-UP

- A. Upon acceptance of the installation work and testing, the Contractor shall restore the project area affected by the operations to a condition at least equal to that existing prior to the work.

2.13 BASIS OF PAYMENT

- A. Refer to basis of payment in Bid Form 00300.

2.14 CONSTRUCT SEWER MANHOLE

Sewer Manhole Construction: This section shall govern the construction of precast and cast-in-place sanitary sewer manholes.

Precast Concrete Sanitary Sewer Manholes:

- A. Precast Concrete Manhole Sections shall conform to the latest revision for Precast Reinforced Manhole Sections, ASTM C-478. The manhole sections shall be machine made by a process which will provide for uniform placement of zero slump concrete in the form and compaction by mechanical devices which will assure a dense concrete in the finished product.

- B. Joints for the manhole sections shall conform to the jointing specifications in ASTM C-478 with the exception that O-ring rubber gasket joints shall be furnished in accordance with ASTM C-443.
- C. Excavation for manhole construction shall be at the locations as shown on the plans, and shall be wide enough to provide room to install the manhole. The concrete base for the manholes shall be set or poured on solid undisturbed subgrade covered with a minimum of 4" thick granular material to achieve a stable foundation.
- D. Channels and inverts shall be formed in the bottom of the manholes to a depth equal to one-half the diameter of the largest pipe and conforming to the inside of the adjacent sewer pipe. For a pipe running through a manhole, the bottom shall be built-up halfway to the top of the pipe and the top half of the pipe shall be broken out across the manhole. Then the concrete shall be shaped to form vertical channel walls to the top of the pipe and flush with the inside of the pipe using cement grout (2 parts sand & 1 part Portland cement). Where a pipe turns or where there is a junction, the channel shall be curved and shall have a depth equal to the pipe diameter, with the bottom similar in shape to the bottom of the pipe and with channel walls vertical above the center of the pipe. Changes in direction of flow shall be made with a smooth curve of as large a radius as the size of manhole will permit. Changes in size and grade of the channels shall be made gradually and evenly.
- E. Manholes shall be provided with core-drilled openings to accommodate a resilient connector meeting the requirements of ASTM C-923 for all sewer lines entering or leaving the manhole. The resilient connectors shall be either PSX gasket or Press Wedge II as manufactured by Press-Seal Gasket Corp. or similar approved flexible manhole sleeves as manufactured by Kor-N-Seal by NPG Systems, Inc. The connectors shall provide a watertight joint between the manhole and pipe. The annular space shall be sealed at the manhole and the sealing shall be made with material approved by the ENGINEER and shall extend a minimum of 8-inch into the manhole wall in such a manner as to form a smooth, uniform, watertight joint.
- F. Six inch (6") thick precast concrete grade rings shall be used to level the cast iron frame and cover and adjust to the proper final grade. The joints between the precast grade rings shall be sealed watertight with approved pre-formed bitumastic joint sealant. All lifting holes shall be patched with non-shrink grout.
- G. Finish grade for the manhole castings constructed in the paved areas shall conform to the slope of the pavement and be 1/8" below the finished pavement elevation. In non-paved areas, the top of the casting shall be 6" above the surrounding ground.
- H. Vacuum Testing. All lift holes and exterior joints shall be plugged with a non-shrink grout. No grout shall be placed in horizontal joints prior to testing. All pipes entering the manhole shall be plugged. Stubouts, manhole boots, and pipe plugs shall be secured to prevent movement while the vacuum is drawn. A minimum 60-inch-lb torque wrench shall be used to tighten the external clamps that secure the test cover to the top of the manhole. The test head shall be placed at the inside of the top of the cone section, and the seal inflated in accordance with the manufacturer's recommendations. A vacuum of 10 inches of mercury shall be drawn, and the vacuum pump shut off. With all valves closed, the time for the vacuum to drop to 9 inches of mercury shall not be less than one (1) minute. If the manhole fails a test, necessary repairs shall be made with a non-shrink grout while the vacuum is being drawn. The test shall be repeated. If the vacuum test is failed twice, the manhole shall be repaired, and a hydrostatic test shall be performed as provided for herein. The manhole shall be retested as described above until a successful test is made.

2.15 CAST-IN-PLACE CONCRETE SANITARY SEWER MANHOLES

- A. Cast-In-Place Concrete Manholes shall be constructed in place in accordance with the plans and using steel or fiberglass forms. The base shall be cast monolithically with the rest of the manhole, and the inverts or channels shall be formed during the placing of the concrete and brush-finished as soon as the concrete has set sufficiently. The concrete shall set for 24 hours before any pipe inside the manhole is trimmed. The concrete base shall be 3000 psi, maximum 4" slump, vibrated or tamped on 4" thick granular material over a stable subgrade foundation. The base shall have a minimum diameter of 8" greater than the outside diameter of the manhole.

- B. The vertical forms, wall spacers and placing cone must be carefully positioned and firmly clamped in place before concrete placement is begun for the manhole barrel section. The wall spacers must be located 90 degrees from each other. The manhole barrel shall be cast of 3000 psi concrete with a maximum slump of 4". Wall thickness of the manhole barrel shall be a minimum of 6" for 4-foot diameter manholes and minimum of 8" for 5-foot diameter manholes and larger. The first placement shall consist of approximately ½ yard of concrete deposited evenly around the walls and vibrated until there is a minimum slope of 60° from the bottom of the forms to the bearing surface both inside and outside of the manhole. When this is complete and before additional concrete is added, the concrete shall be carefully vibrated on each side of each pipe. Additional concrete shall be deposited in evenly distributed layers of about 18" with each layer vibrated to bond it to the proceeding layer. The wall spacers shall be raised as the placements are made with the area from which the spacer is withdrawn being carefully vibrated. A maximum of 2% Calcium Chloride may be added to the concrete, at the CONTRACTOR's option, to accelerate the set. The forms may be removed as soon as the concrete has sufficiently set. (Approximately 2 Hrs. after placement). Form marks and offsets up to 1" will be permitted on the outside surface of the manhole and form marks and offsets up to ½" will be permitted inside the manhole. All offsets on the inside surface of the manhole will be smoothed and grouted so there is no visible projections or irregularities. Honeycomb areas will be grouted with an approved mortar material.
- C. Channels and Inverts shall be formed in the bottom of the manholes to a depth equal to one-half the diameter of the largest pipe and conforming to the inside of the adjacent sewer pipe. For a pipe running through a manhole, the bottom shall be built-up halfway to the top of the pipe and the top half of the pipe shall be broken out across the manhole. Then the concrete shall be shaped for form vertical channel walls to the top of the pipe and flush with the inside of the pipe using cement grout. Where a pipe turns or where there is a junction, the channel shall be curved and shall have a depth equal to the pipe diameter, with the bottom similar in shape to the bottom of the pipe and with channel walls vertical above the center of the pipe. Changes in direction of flow shall be made with a smooth curve of as large a radius as the size of manhole will permit. Changes in size and grade of the channels shall be made gradually and evenly.
- D. Manholes shall be constructed with openings to accommodate a resilient connector meeting the requirements of ASTM C-923 for all sewer lines entering or leaving the manhole. The resilient connectors shall be either PSX gasket or Press Wedge II as manufactured by Press-Seal Gasket Corp. or similar approved flexible manhole sleeves as manufactured by Kor-N-Seal by NPG Systems, Inc. The connectors shall provide a watertight joint between the manhole and pipe.
- E. Vacuum Testing. All lift holes and exterior joints shall be plugged with a non-shrink grout. No grout shall be placed in horizontal joints prior to testing. All pipes entering the manhole shall be plugged. Stubouts, manhole boots, and pipe plugs shall be secured to prevent movement while the vacuum is drawn. A minimum 60-inch-lb torque wrench shall be used to tighten the external clamps that secure the test cover to the top of the manhole. The test head shall be placed at the inside of the top of the cone section, and the seal inflated in accordance with the manufacturer's recommendations. A vacuum of 10 inches of mercury shall be drawn, and the vacuum pump shut off. With all valves closed, the time for the vacuum to drop to 9 inches of mercury shall not be less than one (1) minute. If the manhole fails a test, necessary repairs shall be made with a non-shrink grout while the vacuum is being drawn. The test shall be repeated. If the vacuum test is failed twice, the manhole shall be repaired, and a hydrostatic test shall be performed as provided for herein. The manhole shall be retested as described above until a successful test is made.

2.16 ABANDON EXISTING MANHOLES:

- A. All sewer manholes selected for abandonment shall be excavated a minimum of 3-feet below the existing grade and the manhole sections dismantled at this depth. The remaining portion of the manhole shall then be backfilled with sand in the unpaved areas and granular material within paved areas. The backfill materials within the abandoned manholes shall be compacted to 95% of maximum density as determined by ASTM- 698 from the bottom of the abandoned manhole to finished grade.

2.17 ABANDON EXISTING SEWER LINE:

- A. All sewer lines selected for abandonment shall be plugged at the existing manholes by pumping or pouring concrete into the sewer line to form a concrete plug a minimum of 2-feet into the line from within the manhole. In situations where an existing line makes an aerial crossing, the CONTRACTOR shall cut/saw the existing pipe on either side of the crossing. The CONTRACTOR shall pay particular attention to ensure that the existing pipe is cut as close to the channel wall and/or creek bank as possible. All portions of the pipe located above grade shall be demolished and removed by the contractor. The remaining ends of the abandoned pipe shall be plugged with concrete as previously stated.
- B. Further requirements may include, but not be limited to, flowable fill as set forth in the in Basis of Payment, included with and following the Bid Form.

2.18 EXISTING MANHOLES RE-CONNECT EXISTING COLLECTION LINE:

- A. Connection to Existing Lines: For connection to lines of similar materials, the CONTRACTOR shall utilize a watertight manufactured coupling or transition coupling provided by the pipe manufacturer. For connections to lines of dissimilar materials, the CONTRACTOR shall use Non-Shear Couplings with stainless steel bands, meeting the requirements of ASTM C 1173, Fernco Strong Back RC Series or approved equal.
- B. Where pipe bursting or lining is directly into the manhole, the CONTRACTOR shall install a waterstop gasket and ensure the connection is watertight and the bench is regouted as necessary to ensure a smooth flow transition.

2.19 RECONNECT EXISTING SERVICE TO NEW PVC SEWER LINE:

- A. Reconnect Existing Service to New PVC Sewer Line: CONTRACTOR shall provide for internal TV inspection of the existing line to assist in locating each of the existing main line services. Each existing service shall be located and excavated concurrent with the installation of the proposed sewer line. Appropriate size, approved wyes, tees or saddles shall be installed at 45° with the pipe spring line and each fitting securely supported on a stable foundation encased in crushed rock to prevent horizontal or vertical movement subsequent to backfilling. The proper size PVC service pipe shall be installed from the main sewer line to the existing public right-of-way or private property boundary.
- B. CONTRACTOR shall expedite the reconnection of the services so as to minimize any inconvenience to the customers. If sewage backup occurs causing damage to houses, structures or property, the CONTRACTOR shall be responsible for cleanup, repair, and all cost claims.

2.20 RECONNECT EXISTING SERVICE TO NEW HDPE SEWER LINE:

- A. Reconnect Existing Service to New HDPE Sewer Line: CONTRACTOR shall provide for internal TV inspection of the existing line to assist in locating each of the existing main line services. Each existing service shall be located and excavated concurrent with the installation of the proposed pipe-bursting operation.
- B. Appropriately sized HDPE Gasketed Electro-fusion Sewer Saddles (CENTRAL PLASTICS COMPANY), Faction Fusion HDPE vacuum saddle, or an approved equal shall be installed at 45° with the pipe spring line and each fitting securely supported by a stable foundation encased in crushed rock to prevent horizontal or vertical movement subsequent to backfilling. The proper size PVC service pipe shall be installed from the main sewer line to the existing public right-of-way or private property boundary.
- C. Drilled holes in the main line must match or line up with the saddle and cannot be smaller than the service line size for the saddle where debris could get caught.
- D. Unless determined necessary by the Engineer, no cleanout will be required. However, where determined by the Engineer, the cleanout will be a Schedule 40 PVC tee extended to final grade terminating with a PVC cap.
- E. CONTRACTOR shall expedite the reconnection of the services so as to minimize any inconvenience to the