

SECTION LS 2630

STORM SEWERS

PART 1 – GENERAL

1.1 SUMMARY

- A. This section includes storm sewerage system piping and appurtenances.

1.2 SUBMITTALS

- A. General: Submit the following in accordance with the General Conditions:
 - 1. Product data for drainage piping specialties.
 - 2. Shop drawings for precast concrete storm drainage manholes and catch basins, including frames, covers and grates.

1.3 PROJECT CONDITIONS

- A. Site Information: Perform site survey, research public utility records and physically locate and verify existing utility locations prior to beginning construction of proposed sewer.
 - 1. Verify that storm sewerage system piping may be installed in compliance with original design and referenced
 - 2. Locate existing storm sewerage system piping and structures that are to be abandoned and closed.

1.4 SEQUENCING AND SCHEDULING

- A. Coordinate with other utility work.
- B. Coordinate with other contractors in the project area.

PART 2 – PRODUCTS

2.1 PIPE AND FITTINGS

- A. General: provide pipe and pipe fitting materials compatible with each other. All proposed pipe and fittings shall have the manufacturer's

certification for the applicable burial depth. Where more than one type of materials or products is indicated, a product shall be proposed to the City for prior acceptance.

- B. Provide SDR 26 storm sewer main pipe with premium joints unless otherwise stated in the plans.
- C. Provide storm sewer lateral pipe and fittings per CMS 707.44.
- D. Underdrains shall be six (6) inches in diameter and shall conform to the requirements of CMS Item 605, except that CMS 707.33 pipe material (corrugated polyethylene smooth lined pipe) shall be used. Filter fabric shall not be used unless specifically required by The City of Lakewood or as shown on the tabulation.
- E. Slag shall not be used for any purpose on this project. #8 washed limestone shall be used for underdrain bedding and backfill.
- F. Inspection Tee's: Riser shall be six (6) inch diameter PVC sewer pipe meeting these specifications with 6" x 6" connection to the lateral (sweeping) and an E-Z set locating plug cap at the top. In pavement areas an East Jordan #3675 or approved equal shall be installed. See City of Lakewood Standard Detail S-4.

2.2 MANHOLES, CATCH BASINS AND INLETS

- A. General: Provide pipe and pipe fitting materials compatible with each other. Manholes, catch basins and castings shall be certified by the manufacturer to be capable of supporting HS-20 highway loads. Where more than one type of materials or products is indicated, a product shall be proposed to the City for prior acceptance.
- B. Manholes shall be ODOT Standard No. 3, in accordance with CMS 604 with the following requirements:
 - 1. Top Section: Eccentric cone type, unless concentric cone or flat-slab-top type is indicated. Top of cone to match grade rings.
 - 2. Grade Rings: Brick not to exceed nine inches (9") total thickness and match 24-inch diameter frame and cover.
- C. Castings:
 - 1. Manholes: East Jordan #1715 w/solid Type A cover Stamped "STORM".
 - 2. Over-Under Sewer Manholes - Invert Plates Frame and Cover: East Jordan 8650.

- D. Catch Basin: Cuyahoga County Standard Detail 3C S/T with sump and trap. Trap shall be East Jordan #5964-10 with reducer as required.
- E. Catch Basin Castings:
 - 1. Gutter inlet at a Type 2, 4 or 6 curb: East Jordan #7035 with M2 Grate and T4 Curb Box with bicycle-safe grate.
 - 2. Centerline inlet at inverted crown: East Jordan #V-5360 with bicycle-safe grate.
 - 3. Gutter Inlet: East Jordan #V-4430 with Bicycle Safe Type A grate.
 - 4. Gutter inlet at rolled curb: East Jordan #V-4510-1 with bicycle-safe Type A grate.

PART 3 – EXECUTION

3.1 STORM SEWER

- A. Install storm sewer per CMS Item 603 Type B Conduit with Type 2 bedding, except as modified herein.
- B. Preparation of foundation for sewers:
 - 1. Grade trench bottom to provide a smooth, firm, stable and rock-free foundation throughout the length of the pipe.
 - 2. Remove unstable, soft and unsuitable materials at the surface upon which pipes are to be laid and backfill with compacted No. 57 limestone to required bedding elevation.
- C. Installation, General:
 - 1. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves and couplings in accordance with manufacturer's recommendations for use of lubricants, cements and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.
 - 2. Only wye fittings shall be used to connect laterals to main sewer. Mechanically connected and gasketed "tees" can be inserted in

larger diameter pipe only with the expressed approval of The City of Lakewood.

3. Use proper size increasers, reducers and couplings where different size or material of pipes and fittings are connected.
4. The Contractor shall correct all defects detected during the inspection and testing of the storm sewer at no additional cost to the project.
5. Clear interior of piping and structures of dirt and other superfluous material as work progresses.
6. All new laterals to the right-of-way lines shall be provided with a new test tee.
7. Ponding or flooding shall not be used to compact backfill.
8. Bed the pipe with 6" of compacted No. 57 Limestone and place No. 57 limestone 12" over the pipe. The remaining backfill shall be LS 613 LSM up to subgrade elevation

3.2 DRAINAGE STRUCTURES

- A. Install drainage structures per CMS Item 604, except as modified herein.
- B. General Locations and Arrangements: Catch basin leads shall intersect the basin in the middle of the 3' side. Elbows shall be used on the leads to direct the leads to the receiving manhole.
- D. Preparation of foundation for drainage structures:
 1. Grade bottom to provide a smooth, firm, stable and rock-free foundation throughout the length of the pipe.
 2. Remove unstable, soft and unsuitable materials to a surface upon which drainage structures are to be constructed and backfill with No. 57 limestone to indicated level.
- E. Installation, General:
 1. Assemble as detailed on the drawings.
 2. A minimum of four (4) inches of compacted No. 57 limestone shall be placed between the manhole or catch basin box and the prepared subgrade.

3. Backfill around manholes and catch basins shall be compacted No. 57 limestone.
4. Install gaskets, seals, sleeves and couplings in accordance with manufacturer's recommendations for use of lubricants, cements and other installation requirements.
5. Protect existing piping and structures to prevent concrete or debris from entering during construction. Remove debris, concrete or other extraneous material that may accumulate on a daily basis.

F. Repair of Drainage Structure Masonry:

1. The Contractor shall remove and replace masonry as directed by The City of Lakewood. The removal and replacement of the masonry shall follow the procedures as directed by CMS Section 604 and all other applicable sections.
2. Catch basin brick work must be installed so that a 12-inch diameter rigid catch basin cleaning vacuum pipe can be inserted and access the sump bottom.
3. A test pig shall be pulled through all new piping prior to acceptance by the City.

G. Sewer Separations

1. In the event, that a sewer separation is being performed and the existing over-under sewer is being converted to a storm only manhole. The existing invert plate cover shall be removed and disposed. After the separation work is completed, the resulting lower sanitary pipe remaining shall be abandoned by filling with a high strength grout mix up to the storm manhole invert elevation. This work is incidental to the sewer separation work.
2. In the event, that a sewer separation is being performed and the existing over-under sewer is being converted to a sanitary only manhole. After the separation work is completed, the existing storm line shall be abandoned by bulkheading the entry and exit points and abandoning the storm line by filling with a high strength grout mix. The invert plate cover shall be removed and disposed. This work is incidental to the sewer separation work.

3.3 FIELD QUALITY CONTROL

- A. After 30 days from the installation, a test pig shall be pulled through all new sewer main pipe prior to acceptance by the City. All new sewer lines shall be CCTV upon completion of the test pig pulling test.
- B. Cleaning: Clear interior of piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.
 - 1. In large, accessible piping, brushes and brooms may be used for cleaning.
 - a. Place plugs in ends of uncompleted pipe at end of day or whenever work stops.
 - b. The Contractor is financially liable for all expenses incurred as a result of construction debris or other negligent activities that cause a sewer restriction or blockage.

3.4 FINAL CLEANING AND DOCUMENTATION

- A. **Final project acceptance and retainage release are contingent upon completion of the following:**
- B. The Contractor shall provide a final cleaning of all storm main sewers, manholes, catch basins, catch basin leads and laterals after all other construction activities have been completed.
- C. The Contractor shall provide a video recording of the interior of the storm main sewers, laterals and manholes after the cleaning has been completed.
- D. All catch basins exposed to construction activities, including those adjacent to the construction area, shall be opened, cleaned and inspected down to the bottom of the sumps at the conclusion of construction. This item shall include removal of standing water. All debris and sediment shall be removed by the Contractor.
- E. The Contractor shall televise and provide a video recording of the main sewer downstream of the new main sewer to the next manhole or 300 feet, whichever is less. All debris so located shall be removed by the Contractor.
- E. All cleaning and documentation costs shall be included in the tabulated items for storm sewer, storm manhole, lateral and catch basin installations or pavement installation. All video shall be turned over to the City.

PART 4 – PAYMENT

4.1 METHOD OF MEASUREMENT

- A. The City of Lakewood will measure and pay for Storm Sewer Pipe by the actual length of pipe and fittings installed. Measurements of pipe will include the length of fittings and couplings, etc. Payment for these items shall be considered full compensation for all labor, equipment, and material necessary to ensure a complete installation. Including all pavement removal, trench cut-back removal, excavation, removal of existing manhole, removal of existing catch basin, removal of existing invert frame and cover, removal of all temporary backfill and/or pavement, disposal of materials, open-cut or boring/jacking operation, temporary backfill, permanent backfill, aggregate base, pavement restoration in-kind, and the installation of all connections unless itemized separately. This item includes all by-pass and dewatering required to complete the work.

- B. The City of Lakewood will measure and pay for Storm Manholes, Catch Basins and Invert Frame and Covers by the number of each installed. Payment for these items shall be considered full compensation for all labor, equipment, and material necessary to ensure a complete installation. Including all pavement removal, trench cut-back removal, excavation, shoring, removal of existing manhole, removal of existing catch basin, removal of existing invert frame and cover, removal of all temporary backfill and/or pavement, disposal of materials, open-cut or boring/jacking operation, temporary backfill, permanent backfill, aggregate base, pavement restoration in-kind, site restoration in-kind for landscape areas, testing, CCTV, cleaning and the installation of all connections unless itemized separately. This item includes all by-pass and dewatering required to complete the work.

- C. The City of Lakewood will measure and pay for Catch Basin connections and couplings by the actual length of pipe and fittings installed.

4.2 BASIS OF PAYMENT

- A. The City will pay for accepted quantities at the contract unit prices as follows:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
LS 2630	Foot	_____ Inch Storm Sewer Pipe

LS 2630	Each	_____ Inch Storm Manhole
LS 2630	Each	Catch Basin, As Per Plan
LS 2630	Each	Manhole, As Per Plan
LS 2630	Each	Invert Frame and Cover
LS 2630	L.F.	10” – 12” Catch Basin Connections and Couplings

END OF SECTION LS 2630