MICHIGAN

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

FOR

**SANITARY SEWER SYSTEM MATERIALS AND CONSTRUCTION**

UTL:JBM 1 of 4 APPR:NJM:CJD:08-04-22

**a. Description.** This work consists of installing sanitary sewer of the nominal diameter and trench detail as detailed on the plans as part of the Genesee County Drain Commissioner Water & Waste Services (GCDC-WWS) system. This work includes trench excavation, dewatering, sheeting and/or bracing, backfilling, testing of the pipe, disposal of waste materials, connections to existing systems, maintaining sanitary service, providing as-built plans, and all labor and related work necessary to complete the sewer installation.

**b. Submittals**. Submit PDF product data consisting of shop drawings and manufacturer’s literature to the Engineer and GCDC-WWS for approval at least 10 working days prior to construction.

Submit a general work plan outlining the procedure and schedule to be used for installation of the sanitary sewer to the Engineer and GCDC-WWS for approval at least 10 working days prior to construction.

**c. Materials.** Furnish the listed materials below in accordance with the standard specifications and as detailed on the plans. The specific items listed are in accordance with the GCDC-WWS sanitary sewer system requirements and no substitutions are permitted.

1. Pipe. Furnish reinforced concrete sanitary sewer pipe in accordance with *ASTM C76*.Ensure the size and class of reinforced concrete sanitary sewer pipe is specified on the drawings. Ensure the minimum class and wall thickness of reinforced concrete sanitary sewer pipe is Class III, Wall B. Concrete sanitary sewer pipe joints must have a solid rubber compression gasket in accordance with *ASTM C443*.

2. Sanitary Sewer Main in a Steel Casing. Furnish reinforced concrete sanitary sewer pipe in accordance with subsection c.1 of this special provision. Ensure steel casing pipe meets *ASTM A139/A139M, Grade B*, in accordance with section 909 of the Standard Specifications for Construction, this special provision, and GCDC-WWS requirements.

3. Sanitary Structures. Furnish precast concrete sanitary manholes in accordance with section 825 of the Standard Specifications for Construction, *ASTM C478/C478M,* and as detailed on the plans. Ensure modified joint and premium rubber joints for precast manholes are in accordance with *ASTM C443*. Ensure all manhole sections are set on 8-inch precast slab for depths up to and including 20 feet and a 12-inch precast slab for depths greater than 20 feet. Use integrally cast wall and slab sections.

Ensure all manhole steps are copolymer polypropylene plastic and installed in the manhole. Furnish copolymer polypropylene steps from M.A. Industries PS-1-PF, American Step Co. ML-10, or Engineer approved equal and contains 0.5-inch Grade 60 steel reinforcement. Embed manhole steps a minimum distance of 3 inches into the riser and conical top section wall. Ensure a minimum clear distance of 4-inches from the wall measured from the point of embedment.

Ensure all manhole frames and covers are EJ No. 1040-1ZPT Type A solid cover.

All manhole frames must have anchor base flange holes furnished for bolting the frames to the cone section. Ensure manhole covers are equipped with four stainless steel cap screws countersunk flush with the cover. Connect the manhole frame and manhole cover to the cone section by use of four chromite coated 0.625-inch thread studs with washers and nuts. Field cut bolts to a proper length a maximum of 0.5 inch above the nut. Ensure all manhole covers are stamped “SANITARY SEWER” and contain 2-inch raised letters.

Ensure precast concrete grade rings, from the Qualified Products List (913.06), are used to bring manhole covers to grade. Ensure the final adjustments are approved by the Engineer and GCDC-WWS. The maximum adjustment allowed is 9 inches. The use of block or brick for adjustment is prohibited. Permissible grade ring sizes for manhole adjustment will be 3 inches, 4 inches, or 6 inches as required to finish grade. A maximum of two grade rings are allowed.

Install an exterior seal of Infi-Shield, Butyl, or Engineer approved equal to seal all manholes. Within road right-of-way, place mortar between grade rings, manhole frames, and manhole sections.

4. Flowable Concrete Fill. Furnish concrete fill for casing pipe in accordance with the Special Provision for Non-Structural Flowable Fill.

**d. Construction.** Perform all work in accordance with section 825 of the Standard Specifications for Construction, GCDC-WWS specifications, and as shown on the plans. Contact Matthew T. Raysin, P.E. or other designated individual from the GCDC-WWS at (810) 732-7870 at least 2 work days prior to any sanitary sewer construction related activities. Do not make any connection to an existing sanitary sewer pipe until the sanitary sewer, as shown on the plans, has been tested and approved by GCDC-WWS.

Examine all sanitary sewer pipe and materials for defects prior to installation. Remove all damaged or defective sanitary sewer pipe and materials from the site, at Contractor’s expense. Ensure the sanitary sewer pipe is free from all defects and foreign materials before and during installation. Install the sanitary sewer pipe with laser equipment at the elevation and grade specified on the drawings. Install the bell-end of the sanitary sewer pipe upgrade. Ensure all sanitary sewer pipe is completely connected to ensure passage of an air test. Any sanitary sewer pipe proposed to be installed with less than 5 feet of cover must receive GCDC-WWS written approval. The GCDC-WWS will determine whether insulation is needed and the type of insulation to be used. Install insulation if necessary at the Contractor’s sole expense. Ensure that construction of the proposed Steel Sheet Piling, Temp, Left in Place is gapped out as shown on the plans to avoid conflict with the proposed sanitary sewer.

1. Air Test. Preliminarily test the sanitary sewer pipe before contacting GCDC-WWS for the air test described below. Clean the sanitary sewer pipe prior to testing to wet the sanitary sewer pipe and eliminate all debris.

Where groundwater conditions require dewatering operations to construct the sewer, the Contractor may, at his option, perform a preliminary air test after backfilling and while the dewatering equipment is still operating. After dewatering operations have ceased and groundwater has stabilized at its normal level (7 feet or less above the sewer), and if the preliminary air test was satisfactory, the preliminary air test may be accepted as final to the satisfaction of GCDC-WWS.

Conduct an air test in the presence of GCDC-WWS as follows:

A. Determine the test time for the section of sanitary sewer pipe using Table 1.

B. Plug all openings in the sanitary sewer pipe to be tested.

C. Add air until the internal pressure of the sanitary sewer pipe is raised to at least 4.0 psi.

D. After the internal pressure of 4.0 psi is reached, allow the air pressure to stabilize. This may take from 2 to 5 minutes, depending on the sanitary sewer pipe size.

E. When the air pressure has stabilized and it is at or above the starting pressure of 3.5 psi, start the air test.

F. If the air pressure drops more than 1.0 psi during the test period, the sanitary sewer pipe has failed the air test.

G. If a 1.0 psi drop does not occur during the test period, the sanitary sewer pipe has passed the air test.

**Table 1: Minimum Test Periods for Various Sanitary Sewer Pipe Sizes**

|  |  |
| --- | --- |
| Nominal Sanitary Sewer Pipe Size | Time (minutes)/100 Feet |
| 12 inch | 1.8 |

2. Sanitary Sewer in Steel Casing Pipe. Install steel casing pipe of the size and trench detail specified in accordance with the Standard Specifications for Construction. Install pipe inside the casing in accordance with the standard specifications and as shown on the plans. Position spacers at intermediate intervals in accordance with the manufacturer’s specifications and recommendations. Secure the ends of the casing pipe to the exterior portion of the sanitary sewer using end seals. Provide non-metallic casing spacers to support the sanitary sewer inside the casing meeting material specifications as set forth in the following *ASTM standards*: *ASTM D638*, *D695*, *D570,* and *D256*. Ensure each casing spacer provides full length, integrally molded skids extending beyond the bell or mechanical joint of the carrier pipe. Ensure spacers are acceptable to GCDC-WWS and approved by the Engineer. Pump flowable concrete fill between the sanitary sewer pipe and the steel casing pipe the entire length of the bore.

3. Video. Provide to GCDC-WWS a video of the entire sanitary sewer pipe system once it has been approved by the Engineer. The video must conform to industry standards and practices for sanitary sewer videotaping. Promptly correct any deficiencies in the sanitary sewer pipe system as revealed by the videotape, at Contractor’s sole expense.

4. As-Built Plans. Provide as-built plans of the sanitary sewer, acceptable to the Engineer. The cost of this is included in the cost of the sanitary sewer. Acceptable as-built plans include, but are not limited to, pipe size, pipe locations, manholes, invert elevations, tees, tie-ins, and individual service connections. Sanitary sewer work will not be considered complete, and payment may be withheld, until acceptable as-built plans have been provided to the Engineer.

**e. Measurement and Payment.** The completed work, as described, will be measured, and paid for at the contract unit price in accordance with sections 401 and 825 of the Standard Specifications for Construction except as follows:

**Pay Item Pay Unit**

Sanitary Structure, \_\_inch dia, Modified Each

Sanitary Structure Cover, Type \_\_, Modified Each

Sanitary Sewer, Conc, \_\_ inch Foot

1. **Sanitary Structure, \_\_ inch dia, Modified** of the diameter specified, will be measured as Drainage Structure in accordance with section 825 of the Standard Specifications for Construction and paid for at the contract unit price for the above pay item.

2. **Sanitary Structure Cover, Type \_\_, Modified** of the type specified, will be measured as Sanitary Structure Cover in accordance with section 825 of the Standard Specifications for Construction and paid for at the contract unit price for the pay item.

3. **Sanitary Sewer, Conc, \_\_ inch** will be measured in place per foot along the centerline of the pipe. Payment includes sanitary sewer installation in the casing pipe, including all necessary fittings, casing spacers and end seals.