

## **CHAPTER 4 - WASTEWATER COLLECTION SYSTEM CONSTRUCTION**

### **4.00 General Requirements**

#### **A. Preconstruction Conference Requirement**

No sewer main construction shall commence prior to pre-construction meeting. After completion of construction and submittal of required documents and fees, final acceptance will be given by the City at which time service will be available by permit and side sewer connection. See Section 1 of this volume of the City standards for additional requirements.

#### **B. Side Sewers**

1. Side sewer permits for commercial and multifamily projects will be issued to owners as an extension agreement pre-construction requirement and shall be installed by a bonded contractor. The owner is required to make application and pay all necessary fees to obtain a permit. The side sewer can be installed as part of the mainline extension and put in use only after acceptance of the mainline system by the City.
2. Side sewer permits for plats will be issued for installation only after main line extensions are accepted by the City. The lot owner or his bonded contractor is required to make application and pay all necessary fees, obtain a side sewer permit and connect the side sewer from the mainline lateral to the house plumbing.

### **4.01 Connection to Existing Systems**

- A. Connection of new pipe lines to existing manholes shall be accomplished by using manufacturer's provided knock-outs. Where knock-outs are not available the manhole shall be core drilled for connection.
- B. Connection of a pipe line to a system where a manhole is not available shall be accomplished by pouring a concrete base and setting manhole sections. The existing pipe shall not be cut into until approval is received from the City.
- C. Connections to manholes using inside or outside drop structures shall be as approved by

the City.

- D. Connection of new laterals to existing mains shall be a minimum of 4 inches (4") and shall be accomplished by stainless steel saddle and tapping the main where the lateral to be installed is smaller than the main. All taps shall be accomplished in the presence of a City inspector at the Owner's expense.
- E. Connections where the new lateral is the same size as the existing main shall be accomplished by cut-in of a tee using a mechanical coupling as approved by the City. Tee cut-ins on cast iron or ductile iron will require installation of a tee made of the same material as the main.
- F. Connection to an existing manhole requires the installation of one-fourth (1/4") inch mesh screen in the downstream line while making connection to eliminate debris from entering the existing system. After the connection has been completed the new incoming pipe shall be plugged. Where a heavy flow exists in the connection manhole and when unable to use the one-fourth inch (1/4") mesh screen, due care should be used to keep debris out of the downstream line.

#### **4.02 Roadway and Railway Crossing**

The owner shall use the method which has been designed on the plans and is acceptable to the City and the governmental or private agency having control of the road. Permits are required and shall be obtained prior to the City granting construction approval.

#### **4.03 Trench Excavation**

- A. Trench excavation shall be completed in accordance with Section 7-17 of the Standard Specifications.
- B. Trenching operations shall not proceed more than one hundred feet (100') in advance of pipe laying except with written approval of the City.
- C. When trenching operations involve cutting through concrete pavement, the pavement shall be removed to width of eighteen inches (18") greater than the top width of the trench. The concrete shall be cut on a straight line and shall be beveled so that the cut will be approximately one inch (1") wider at the top than at the bottom.
- D. Where a sewer main crosses under an A.C. water main the contractor shall replace the existing A.C. main over the excavation with Ductile Iron Pipe Class 52 to a point of

bearing soil a minimum of three feet (3') each side of the excavation .

#### **4.04 Pipe Laying**

- A. Pipe laying shall be in accordance with Section 7-17 of the Standard Specifications.
- B. The first section of pipe not less than one hundred feet (100') in length installed by each crew shall be tested in order to qualify the crew and/or material. Successful installation of this section shall be a prerequisite to further pipe installation by said crew.

#### **4.05 Pipe Bedding**

Imported bedding will be required of all sewer pipe and service pipe. Bedding shall be compacted to 90% of the maximum theoretical density as measured by the modified AASHTO method prior to placement of the next layer.

#### **4.06 Pipe in Filled Areas**

Where pipe is to be installed in filled areas, special treatment may be required at the discretion of the City. This treatment may consist of the following: (1) compacting the backfill in six inch (6") layers, (2) careful choice of backfill materials, (3) use of a mechanical joint, and (4) ductile iron pipe or such other reasonable methods or combination as may be deemed necessary by the City.

#### **4.07 Pipe Materials**

- A. Gravity sewer alternative materials.
  - 1. Non-reinforced concrete pipe per ASTM C 14, Class 2 or 2.
  - 2. Reinforced concrete pipe per ASTM C 76, Class III, IV, or V.
  - 3. Ductile Iron per AWWA C151, Class 52.
  - 4. Polyvinylchloride (PVC), 4" to 15" per ASTM D 3034, SDR 35, or ASTM F 789.
  - 5. Polyvinylchloride (PVC), 18" and larger per ASTM F 679.
- B. Force mains

1. Ductile Iron per AWWA C151, Class 52.

#### **4.08 Manholes**

- A. Materials and construction shall be per Section 7-05 of the Standard Specifications.
- B. All manholes and cleanouts shall be constructed to finished grade. Any re-adjustment of finish grade by the developer or lot owner shall require that party to adjust the manhole and/or cleanout fixtures to the new finished grade.
- C. Provide locking manhole covers in areas outside of public right-of-way.
- D. For rigid pipe, there shall be flexible connections provided at the inlets and outlets of each manhole. For all pipes the flexible joint shall be within 1 2 pipe diameters, not to exceed 18 inches, or the exterior wall of the manhole. A flexible connection Aboot@ or insert may be utilized in lieu of a flexible joint.

#### **4.09 Side Sewers**

- A. General. Owners of properties located within the sanitary sewer services area with conventional service available shall be required to extend from the structure plumbing system to the main line side sewer connection
- B. Application for Side Sewer Permit. Before construction and connection of a side sewer on public or private property, the owner is required to apply for and have a permit issued by the City.
- C. Installation. Installation of side sewers is to conform to the requirements of the Uniform Plumbing Code, latest edition, the Standard Details, and Section 7-18 of the Standard Specifications.

#### **4.10 Grease Interceptor**

Grease interceptors shall be constructed as shown in the standard details. Excavation for precast vault shall be sufficient to provide a minimum of 12 inches (12 n ) between the vault and the side of the excavation.

24 inch (24") diameter manhole frame and cover shall be adjusted to the elevation required by the Engineer prior to final acceptance of the work. Adjusting rings shall be manufactured from precast reinforced concrete. Total height of rings shall be from 8 inches (8") minimum to 20 inches (20") maximum.

The grease interceptor shall be placed on firm soil. If the foundation material is inadequate, the Contractor shall use foundation gravel or bedding concrete under the normal base to support the interceptor. Vault shall be placed and set plumb 80 as to provide vertical sides. The completed interceptor shall be rigid and watertight.

The outside and inside of manhole adjusting rings, joints of precast concrete sections and the perimeter of precast baffle shall be thoroughly wetted and completely filled with mortar, plastered and troweled smooth with 3/4 n of mortar in order to attain a watertight surface.

All lift holes, if any, on precast items shall be completely filled with expanding mortar, smoothed both inside and out, to insure water-tightness. All steel loops, if any, on precast section must be removed, flush with the vault wall. The stubs shall be covered with mortar and smoothed. Rough, uneven surfaces will not be permitted.

Precast vault and baffle shall be provided with 8 inch (8") diameter knockouts at all pipe openings or have openings core-drilled prior to installation.

All rigid pipe entering or leaving the structure shall be provided with flexible joints within twelve inches (12") of the manhole structure and shall be placed on firmly compacted bedding. Special care shall be taken to see that the openings through which pipes enter the structure are completely and firmly filled with mortar from the outside to ensure water-tightness. All P.V.C. pipe connections to vault and baffle shall be made with gasketed coupling as approved by the City.

#### **4.11 Commercial Clean-Out With Test Sampling Tee Or Manhole**

Where test sampling tees are installed, they shall be placed outside the building no more than 36 inches (36") downstream of a clean-out extended to grade, enclosed in a cast concrete meter box. The enclosure shall be supported on minimum 2 inch thick gravel base. The capped orifice shall be a maximum of 4 inches (4") from finished grade. The sampling tee shall be installed so that it opens in a direction at right angles to and vertically above the flow of the pipe. The sampling tee shall be accessible at all times for compliance determination sampling.

The clean-out shall be brought to grade and provided with a 6 inch (6") diameter cast iron frame and cover imbedded in class "C" concrete.

#### **4.12 Testing Bedding and Backfill for Trenches**

Compaction testing shall be performed for all pipe trenches as specified in the Standard Specifications. Minimum number of tests required are as follows:

- A. Provide one test at bottom of trench excavation prior to placement of pipe or bedding for every 500 feet of trench.
- B. Provide one test at top of bedding for every 500 feet of trench.
- C. Provide one test for each lift of backfill for every 500 feet of trench.

#### **4.13 Cleaning and Flushing**

Clean and flush per Section 7-17 of the Standard Specifications.

#### **4.14 Testing of Gravity Sanitary Sewers, Laterals, and Manholes**

- A. Clean and test all sewers per Section 7-17.3(4) of the Standard Specifications.
- B. All mainline and lateral sewers constructed of flexible pipe shall be deflection tested not less than 30 days after the trench backfill and compaction has been completed. Testing and corrected action as required shall be per Section 7-17.3(4)H of the Standard Specifications.
- C. All mainline and lateral sewers shall be tested after backfilling by either the exfiltration test, or air test. Testing requirements are as listed in the Standard Specifications.
- D. All sanitary sewer manholes shall be hydrostatically tested. The test shall consist of plugging all inlets and outlets and filling the manhole with water. Each manhole shall be filled to the rim at the start of the test. Leakage in each manhole shall not exceed 0.2 gallons per hour per foot of head above the bottom channel invert. Leakage shall be determined by refilling to the rim using a calibrated known-volume container. Manholes may be filled 24 hours prior to test.
- E. The City will require all sanitary sewers be inspected by the use of a television camera before acceptance. The costs incurred in making the inspection shall be borne by the developer.
- F. The developer shall bear all costs incurred in correcting any deficiencies found during

television inspection including the cost of any additional television inspection that may be required by the City to verify the correction of said deficiency.

- G. Test films will become the property of the City.
- H. Repair by chemical grouting will not be allowed.

#### **4.15 Testing of Pressure Sewer Mains**

Prior to acceptance of the project, the pressure line shall be subjected to a hydrostatic pressure test of 100 psi at the high point of the line. Any leaks or imperfections developing or occurring under the test pressure shall be remedied by the Contractor before final acceptance of the project. Leakage shall be measured by approved means. Test pressure shall be maintained while the entire installation is inspected. The Contractor shall provide all necessary equipment and shall perform all work connected with the tests. Insofar as is practical, test shall be made with pipe joints and fittings exposed for inspection. Maximum leakage allowable shall be .05 gallons per hour per inch of pipe diameter per 100 feet of pipe.