

SECTION 700 SANITARY SEWER SYSTEM

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SECTION 700 SANITARY SEWER SYSTEM**710.00 DESIGN CRITERIA****711.00 General**

The St. Vrain Sanitation District provides sanitary sewer service to the Town. The Developer shall design and construct all of the proposed sanitary sewer facilities to the Districts standards and criteria, in addition to these STANDARDS AND SPECIFICATIONS. Any proposed resolutions of conflicts in the two standards shall be approved by the Town Engineer.

712.00 Design Details**712.01 Sewer Mains**

Sewer mains shall ordinarily have a minimum of eight (8) feet of cover to finished ground surface. Where this will provide less than nine (9) feet of elevation difference between the finished lot grade at building line and the top of the sewer main, it will be indicated on the plans that the lot is served by a "shallow sewer" and appropriate elevation information will be given. Where pipe has less than (4) feet of cover, provisions shall be made to protect the pipe from impact and loading.

Sewer mains shall be extended at least ten (10) feet uphill from the lowest lot corner of the uppermost lot to be served adjacent to the sewer main. Sewer mains will terminate in a manhole. Manholes will be stubbed out with suitable size pipe wherever future extension of the sewer is anticipated.

713.00 Location Details

Unless approved otherwise by the Town Engineer, sanitary sewer mains installed in local or collector streets shall be located ten (10) feet east or south of the centerline of these streets. Service connections will not be permitted to cross an arterial street.

714.00 Relation to Water Mains

Sewer lines will be located a minimum of ten (10) feet, horizontally, from existing or proposed water mains (centerline distance). Where sewer lines cross water mains, the sewer pipe will be a minimum of eighteen (18) inches, clear, below the water main. If this clear distance is not feasible, the crossing must be designed and constructed so as to protect the water main. The Town Engineer must approve the crossing design.

Minimum protection shall consist of the installation of an impervious and structural sewer. Sewer pipe will be encased in reinforced concrete. The encasement shall be at least six (6) inches thick around the entire pipe and will extend a distance of ten (10) feet on either side of the water main. In all cases, suitable backfill or other structural protection must be provided to preclude settling and/or failure of the higher pipe.

715.00 Underdrain Pipe - Private

Underdrain systems shall be private and will **NOT** be maintained by the Town of Firestone.

Underdrain pipe shall be installed at locations shown on the accepted plans. Underdrain pipe will be installed at those locations where excessive groundwater is encountered and the Soils Engineer recommends it. Underdrain installations will require the approval of the Town Engineer.

Should the Developer desire to install an underdrain system to specifically collect the discharge of peripheral drain systems from individual house foundations or from sump pumps installed as a part of a peripheral drain system for house foundations, such a system shall be constructed for the exclusive advantage of the Developer and will **NOT** be maintained by the Town of Firestone. Any such system shall **NOT** be tied into the sanitary sewer collection system in any manner. Clean outs shall **NOT** be installed within a sanitary sewer manhole and will **NOT** be maintained by the Town of Firestone. Any such system will require the approval of the Town Engineer and must meet all applicable portions of Sections 732.02 and 733.04 of these STANDARDS AND SPECIFICATIONS.

720.00 GENERAL PROVISIONS

721.00 Permits Required

A public improvements permit shall not be issued until the St. Vrain Sanitation District has accepted the sanitary sewer main plans.

722.00 Maintenance of Traffic

When street cuts are required for sanitary sewer facilities construction, the following conditions will be met so as to avoid interference with traffic:

- A. Street service cuts will be open only between 9:00 a.m. and 4:00 p.m.; and
- B. Two-way traffic will be maintained at all times around the construction area. A Traffic Control Plan (TCP) must be prepared in accordance with Section 141.08, Traffic Control, Barricades and Warning Signs, of these STANDARDS AND SPECIFICATIONS and submitted to the Town for approval prior to the commencement of construction.

730.00 SANITARY SEWER MAIN CONSTRUCTION

731.00 Site Work and Earthwork

731.01 General

Site work and earthwork shall be performed in accordance with Section 300.00, Site Work and Earthwork, of these STANDARDS AND SPECIFICATIONS.

731.02 Trenching, Backfilling and Compacting

Except where otherwise approved in writing by the Town Engineer, all major arterial or collector streets shall have pipe installed by pushing or boring.

Trenching, backfilling and compacting shall be performed in accordance with Section 350.00, Trenching, Backfilling and Compacting, of these STANDARDS AND SPECIFICATIONS.

731.03 Preservation of Monuments

Refer to Section 141.00, Protection of Public and Utility Interests, of these STANDARDS AND SPECIFICATIONS.

732.00 Materials

732.01 Underdrain Pipe - Private

Underdrain systems shall be private and will **NOT** be maintained by the Town of Firestone. If required as described in Section 717.00 of these STANDARDS AND SPECIFICATIONS, underdrain pipe shall be provided with joints which will prevent any shifting or misalignment of the line. Where under drains are to be constructed under sewer mains, clean-outs shall **NOT** be allowed in manholes. Suitable fittings shall be provided which will allow construction of clean-outs and bends outside of manholes.

The design engineer will determine all underdrain pipe and fittings.

732.02 Manholes

Manholes may be constructed of cast-in-place concrete or precast concrete. Concrete precast reinforced risers and tops must conform to ASTM Designation C-478 except that wall thickness may be either wall "A" or wall "B" as described in ASTM Designation C-76. Manholes shall conform to details shown on the Standard Drawings unless otherwise approved by the Town Engineer. Cones will be of the eccentric type.

The top of the manhole vault shall be a minimum of twelve (12) inches and a maximum of eighteen (18) inches below the finished street or ground surface elevation. Concrete extension risers or collars shall be used to bring the manhole ring and cover up to finished street or ground surface elevation.

Manhole rings and covers (all traffic covers shall be designed for H-20 traffic loading):

- A. Twenty-four (24) inch manhole rings and covers; cover weight = approximately one hundred sixty-five (165) pounds, ring weight = approximately two hundred forty (240) pounds.
- B. Twenty-four (24) inch by thirty-six (36) inch double ring and cover (36" cover with auxiliary 24" opening and cover);
36" cover weight = approximately two hundred fifty (250) pounds.
24" cover weight = approximately one hundred sixty five (165) pounds.
36" ring weight = approximately two hundred eighty (280) pounds.

732.03 Concrete

Concrete shall conform Section 400.00, Concrete Work, of these STANDARDS AND SPECIFICATIONS. Type II cement will be used. Concrete encasement of sewer pipe shall conform to the details outlined in Section 716.00 of these STANDARDS AND SPECIFICATIONS.

732.04 Bedding Materials

The design engineer will determine the bedding materials needed for under drains, if required by the accepted plans.

733.00 Installation**733.01 General**

Installation of PVC sewer main will conform to ASTM Designation D-3034, "Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe". All work shall conform to the accepted plans, specifications, special provisions and the above designation, except as modified herein.

733.02 Alignment and Grade

Sanitary sewers and structures appurtenances shall be constructed accurately to the line and grade as shown on the accepted plans. Construction stakes shall be placed by field parties under the direct supervision of a Registered Professional Land Surveyor licensed to practice in the State of Colorado.

"As-built" drawings, as described in Section 161.00, Construction Plan Requirements, of these STANDARDS AND SPECIFICATIONS, shall be furnished to the Town Engineer.

733.03 Protection of Existing Underground Utilities

The Contractor will be held responsible for the protection of public improvements as stated in Section 141.00, Protection of Public and Utility Interests, of these STANDARDS AND SPECIFICATIONS. It will be the Contractor's responsibility to replace all public improvements so damaged at his own expense.

733.04 Underdrain Pipe - Private

Underdrain systems shall be private and will **NOT** be maintained by the Town of Firestone.

Under drains shall be installed where shown on the accepted plans as required by Section 717.00 of these STANDARDS AND SPECIFICATIONS. Under drains will be day-lighted to the nearest suitable point acceptable to the Town Engineer. The trench will be excavated to the required depth and width and backfilled with underdrain bedding material.

Underdrain pipe to be determined by the design engineer.

Where underdrain pipe is required the thickness of underdrain bedding shall be increased to provide six (6) inches of bedding material under the underdrain pipe and six (6) inches of bedding material between the underdrain pipe and the sewer pipe. The underdrain pipe shall be installed to a true line and grade and held in place with underdrain bedding material as shown on the Standard Drawings. Underdrain pipe shall be continued around manholes by use of suitable bends and other fittings and have a cleanout installed outside the manhole.

733.05 Handling Pipe and Fittings

All pipe, fittings, and specials will be unloaded, stockpiled, hauled, distributed, installed and otherwise handled in a manner that will prevent breakage or other damage thereto and which will insure delivery and installation in a sound and acceptable condition.

740.00 SANITARY SEWER SERVICE LINE CONSTRUCTION**741.00 Trenching, Backfilling and Compacting**

Trenching, backfilling and compacting shall be completed in accordance with Section 350.00, Trenching, Backfilling and Compacting, of these STANDARDS AND SPECIFICATIONS.

742.00 Materials**742.01 Polyvinyl Chloride (PVC)**

Pipe and fittings shall conform to the requirements of ASTM D3034. All joints shall be factory prepared compression type (elastomeric gasket joint), providing a watertight seal. A compression stop, as recommended by the pipe joint manufacturer, will be provided to seal the end joint of dead-end stubs.

742.02 Inspection

All pipes shall be subject to inspection at the point of delivery in Firestone. The purpose of this inspection is to reject pipe that fails to conform to the requirements of these STANDARDS AND SPECIFICATIONS. Plastic joint material damaged in any way shall be cause for rejection of that joint of pipe.

743.00 Installation**743.01 Location and Alignment of Service**

Sanitary sewer service lines shall be constructed on the shortest and straightest route possible. Unless specific approval is obtained in writing from the Town Engineer, all sanitary sewer service lines shall have a minimum depth of three (3) feet.

At no time shall the service line be closer than three (3) feet to a side property line, and no service line may be constructed through or in front of an adjoining property. Sewer service lines shall be typically located a minimum of ten (10) feet to the low side of the water service, generally five (5) feet from the centerline of the lot, or as shown on the accepted plans.

743.02 Crossing Sidewalk or Curb (Existing or Proposed)

In no instance will a trench extend beneath an existing sidewalk or curb. The pipe must be bored, jacked or tunneled through the earth under the sidewalk or curb. If the service line is installed prior to the placement of the sidewalk or curb, the trench shall be backfilled in accordance with Section 353.00, Backfilling for Pipelines and Service Lines, of these STANDARDS AND SPECIFICATIONS.

743.03 Service Stub-ins to Property Line

All sewer service lines shall be marked on the curb with an "X" or "S" symbol where the service crosses under the curb. All service stub-ins shall be stubbed into the lots, ten (10) feet beyond the back of walk or five (5) feet past any utility easement which ever is greater. All service stub-ins shall be located with the end marked with a 2x4 painted green.

750.00 RESTORATION AND CLEANUP

Restoration and cleanup shall be completed in accordance with Section 360.00, Restoration and Cleanup, of these STANDARDS AND SPECIFICATIONS.