

pipe. The pipe and joints shall be tested in place, shall exhibit no infiltration, and shall be designed, constructed and protected against anticipated hydraulic and physical, longitudinal, vertical and horizontal loads and erosion and impact. Sewers laid on piers across ravines or streams shall be allowed only when it can be demonstrated that no other practical alternative exists. Such sewers on piers shall be constructed in accordance with the requirements for sewers entering or crossing under streams. Construction methods and materials of construction shall be such that sewer will remain watertight and free from change in alignment or grade.

- 302.11 Relationship Of Sanitary Sewers and a Public Water Supply:
Sewers shall meet the requirements of the Virginia Waterworks Regulations with respect to minimum distances from water supply wells or potable water supply sources and structures. For all other potable water supply wells or potable water supply sources and structures, sewers should meet the requirements of the Virginia Waterworks Regulations with respect to minimum distances from water supply wells or other water supply sources and structures. No sewer line shall pass within fifty feet (50') of a potable water supply source or structure unless special construction and/or pipe materials are used to obtain adequate protection. The designer is referred to current editions of the Waterworks Regulations and the requirements contained in "Rules and Regulations of the Board of Health, Commonwealth of Virginia, Governing the Disposal of Sewage" as basic design references. The proposed design shall identify and adequately address the protection of all potable water supply structures within one hundred feet (100') of the proposed project.

303.00 MATERIALS AND EQUIPMENT

303.01 Pipe Materials:

- A. Structural Requirements: Structural design of sewers shall conform with the methods given in the ASCE Manual Number 37 for the Design and Construction of Sanitary and Storm Sewers. In the use of this manual, backfill weight shall equal 130 pounds per cubic foot and K_u shall be 0.130. The live load for sewers subject to traffic effect shall be determined from a minimum wheel load equivalent to an H-20 loading (16,000 pound wheel load). An allowance of fifty percent (50%) of the design wheel load shall be added for impact. A minimum wheel load of 10,000 pounds per wheel shall be applied to all other sewers not subject to traffic load.

Ultimate lengths of rigid pipe shall be measured in terms of the ultimate three-edge bearing strength divided by a safety factor of 1.5. The allowable load shall be the working strength times a 2.5 load factor for concrete or arch bedding and times a 1.9 load factor for Class B gravel bedding condition.

B. Pipe Material Selections: The pipe materials listed hereunder have been generally approved for use in the City of Manassas Park. The type or types of pipe proposed for use on any specific project shall be shown on the construction plans and approved by the Director of Public Works.

1. Ductile Iron Pipe: Ductile iron pipe shall be centrifugally cast manufactured in accordance with ANSI Specification A21.51, latest revision, and shall be cement mortar lined in accordance with ANSI Specification A21.4.80.

Slip joint or mechanical joint pipe shall be used for gravity sewers. Slip joint pipe shall be designed in accordance with ANSI standard A21-50 and specified according to ANSI standard A21.11. Class 52 pipe shall be used in all sewer applications, unless otherwise approved by the Director of Public Works. Gaskets shall be furnished by the manufacturer and installed according to his recommendations. Ductile iron pipe may be used in general construction applications. Ductile iron shall be used in exposed pipe installations, across major stream crossings, and for excessive depth of fills where other pipe materials are subject to crushing.

2. Polyvinyl Chloride (PVC): PVC sewer pipe shall be manufactured in accordance with ASTM Designation D 1599 and AWWA C-900. Gravity sewer pipe shall be unplasticized polyvinyl chloride with integral rubber ring wall bell and spigot joints. Installation of PVC gravity sewer pipe and fittings shall be in accordance with ASTM Designation 3034 and manufacturer's recommendations. PVC sewer pipe shall be stored in accordance with manufacturer's recommendations on flat, even surfaces and shall remain racked on the pallets as delivered to the job site until such time as the trench is ready for placement of the pipe; i.e., PVC pipe shall not be strung out on the job site. Pipe stored for more than sixty (60) days prior to installation shall be covered with an opaque covering to prevent damage by the sun.

303.02 Service Connections: Polyvinyl chloride (PVC) sewer pipe conforming to ASTM Designation D 1599 and AWWA C-900; or schedule 40 PVC pipe conforming to ASTM Designation 178-76 shall be used between the sewer main and the building. The PVC joints shall be made with integral rubber ring wall with bonded-in-bell elastomeric seal. The schedule 40 PVC joints shall be made with a solvent weld bell and spigot joint using PVC pipe glue as supplied by the manufacturer. " No-hub" pipe shall not be permitted.

304.00 CONSTRUCTION STANDARDS

304.01 General Requirements: All construction of public and private sanitary sewer mains and appurtenances in the City of Manassas Park shall be in accordance with plans and specifications approved by the Director. Prior to the construction of the approved sanitary sewer, the developer's engineer or surveyor shall place adequate line and grade stakes in order that the sanitary sewer appurtenances may be constructed in accordance with the approved plans.

The engineer or surveyor shall then prepare legible cut sheets at fifty (50) foot stations indicating all pertinent construction data to include sewer service connection locations, concrete encasement or cradle, and finish grades of manhole rims. Five (5) sets of all cut sheets shall be submitted to the Director for review and approval.

If any deviation is contemplated in the location of line or grade of any sewer, structure or appurtenance from the approved plans, a revision to the plans showing the proposed deviation must be submitted to the Director for review and approval before the changes are constructed.

304.02 Excavation: Excavation shall conform to the lines and grades shown on the plans and cut sheets. Excavation shall not be carried below the established grades and any excavation below the required level shall be backfilled with granular material and thoroughly tamped, all at the contractor's expense. The contractor shall do all sheeting, bracing, and shoring, necessary to perform the work, to protect existing structures and to protect all excavations as required under Virginia OSHA Regulations.

Dewatering equipment shall be sized to maintain the trench in a satisfactory condition for pipe laying. Pipe laying will be permitted only where the depth of water is maintained below the surface of the pipe joint.